LAPORAN KEBERLAJUTAN
UI GREENMETRIC TAHUN 2024

Disusun Oleh:

TIM UI GREENMETRIC PPI MADIUN

POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN
BADAN PENGEMBANGAN SDM PERHUBUNGAN
KEMENTERIAN PERHUBUNGAN
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DAFTAR ISI

KATA PENGANTAR

UI GreenMetric World University Ranking merupakan pemeringkatan kampus yang peduli dan menerapkan kebijakan yang berorientasi pada ekologi serta kelestarian lingkungan yang diprakarsai oleh Universitas Indonesia pada tahun 2010. Terdapat 6 (enam) kriteria dalam pengukuran green campus pada UI Greenmetric yaitu Setting and Infrastructure, Energy and Climate Change, Waste, Water, Transportation dan Education and Research. Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun) berpartisipasi dalam pemeringkatan ini dalam rangka peningkatan layanan dan kepedulian terhadap aspek keberlanjutan dan lingkungan.

Dasar hukum dalam pelaksanaan dan penyusunan dokumen UI Greenmetric World University Ranking adalah Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 81 Tahun 2020 tentang Statuta Politeknik Perkeretaapian Indonesia Madiun, dan Keputusan Direktur Politeknik Perkeretaapian Indonesia Madiun Nomor : SK-PPIM 327 Tahun 2024 Tentang Penetapan Tim Pelaksana UI Greenmetric World University Rankings Politeknik Perkeretaapian Indonesia Madiun. Metode pelaksanan kegiatan dimulai dari perencanaan organisasi dan waktu pelaksanaan, pengisian kuesioner dan dokumen pendukung, serta proses upload jawaban dan dokumen pendukung.

Rangkaian kegiatan yang telah dilaksanakan sebagai upaya menjadi bagian dari UI Greenmetric World University Ranking adalah sebagai berikut Penyusunan SK Tim Pelaksana (6 Agustus 20240, Pendaftaran Akun (9 Agustus 2024), Penyusunan dokumen (10 Agustus s.d. 25 September 2024), Review dokumen (26 september 2024), Self Assemen (16 oktober 2024), Pembuatan video untuk bukti tambahan (22 Oktober 2024) dan Pengisian Kuesioner dan Submit Dokumen Bukti (23 Oktober 2024).

Kegiatan ini dapat terselenggara dengan kerjasama yang baik dari panitia dan segenap civitas akademika, dengan harapan bahwa PPI Madiun bisa mendapatkan peringkat 1000 besar *world university sustainability ranking*. Hasil ini juga dapat digunakan dalam pengembangan kampus PPI Madiun agar dapat lebih memperhatikan aspek lingkungan dan berkelanjutan dalam pelaksanaan kegiatan pendidikan, penelitian, pengabdian masyarakat.

Ketua Panitia

Tim Pemeringkatan UI Greenmetric

A. LATAR BELAKANG

UI Greenmetric World University Ranking merupakan pemeringkatan kampus hijau dan kelestarian lingkungan yang diprakarsai oleh Universitas Indonesia pada tahun 2010. Melalui 39 indikator dalam 6 kriteria, UI GreenMetric World University Rankings secara hati-hati menentukan peringkat berdasarkan komitmen dan inisiatif lingkungan universitas. UI Greenmetric telah mengalami peningkatan dramatis peserta dari 95 universitas di 35 negara pada tahun 2010 menjadi 1.183 universitas di 84 negara pada tahun 2023.

Politeknik Perkeretaapian Indonesia Madiun memiliki komitmen yang kuat terhadap keberlanjutan dan pengelolaan lingkungan. Sebagai institusi pendidikan tinggi yang bertanggung jawab, pendidikan dan penelitian harus selaras dengan upaya menjaga dan melestarikan lingkungan. Mengikuti pemeringkatan UI GreenMetric World Sustainability Ranking merupakan langkah strategis bagi PPI Madiun untuk mengukur dan meningkatkan upaya keberlanjutan di kampus.

Dengan latar belakang inisiatif keberlanjutan dan komitmen untuk menciptakan dampak positif bagi lingkungan, PPI Madiun siap untuk berpartisipasi dalam pemeringkatan UI GreenMetric World Sustainability Ranking. Partisipasi ini akan memperkuat upaya institusi dalam menciptakan kampus yang berkelanjutan dan berkontribusi pada tujuan pembangunan berkelanjutan secara global.

Melalui kegiatan ini, diharapkan PPI Madiun semakin meningkatkan komitmennya terhadap keberlanjutan lingkungan, dan PPI Madiun akan mendapatkan beberapa manfaat, antara lain:

1) Dapat mengintegrasikan prinsip-prinsip keberlanjutan ke dalam kurikulum, penelitian, dan kegiatan operasional.
2) Melaksanakan berbagai inisiatif lingkungan, seperti program daur ulang, pengurangan penggunaan plastik, penggunaan energi terbarukan, dan pengelolaan limbah yang efektif. Aktif dalam mengembangkan ruang terbuka hijau yang dapat dimanfaatkan oleh seluruh civitas akademika.
3) PPI Madiun dapat mendorong penelitian yang fokus pada isu-isu lingkungan dan perubahan iklim. Program studi juga didorong untuk mencakup mata kuliah yang berkaitan dengan keberlanjutan dan konservasi lingkungan sehingga dapat menyiapkan taruna untuk menjadi agen perubahan di masyarakat.
4) Menjalin kemitraan dengan komunitas lokal untuk mempromosikan kesadaran dan tindakan keberlanjutan. Melalui program pengabdian masyarakat, taruna dan staf terlibat langsung dalam proyek-proyek yang berkontribusi pada perlindungan lingkungan.

5) Dapat menilai diri dalam konteks global dan mendapatkan umpan balik yang konstruktif untuk perbaikan.
6) Memberikan kesempatan untuk bertukar pengalaman dan praktik terbaik dengan universitas lain di seluruh dunia.

B. TUJUAN

Tujuan penyelenggaraan kegiatan Pemeringkatan UI Greenmetric ini adalah sebagai berikut:

1) Menyelenggarakan Peringkat Universitas Dunia tahunan yang keberlanjutan.
2) Mendorong praktik keberlanjutan di universitas di seluruh dunia.
3) Menyediakan layanan terkait keberlanjutan untuk universitas di seluruh Dunia.
4) Memfasilitasi kemitraan internasional tentang keberlanjutan.
5) Politeknik Perkeretaapian Indonesia Madiun menjadi percontohan kampus hijau di wilayah Jawa Timur.

C. PERENCANAAN KEGIATAN

1. Persiapan UI Greenmetric PPI Madiun

Persiapan dilakukan dengan pengumpulan data pemeringkatan UI Greenmetrik Tahun 2024, Pada tanggal 9 September 2024, tim UI Greenmetrik PPI Madiun melakukan registrasi pada website pemeringkatan (www.greenmetric.ui.ac.id) dan mendownload semua file yang dibutuhkan. Jumlah file untuk data dukung yang didownload sejumlah 54 item yang terdiri atas file Setting & Infrastructure, Energy & Climate Change, Waste, Water, Transportation, dan Education & Research.

Gambar 1. Interface website UI Greenmetric

Persiapan selanjutnya adalah organisasi tim kerja UI Greenmetric dengan menyusun personil yang berfungsi sebagai sebagai koordinator dan anggota untuk masing-masing bidang di UI Greenmetric. Output dari kegiatan ini adalah terbitnya Keputusan Direktur Politeknik Perkeretaapian Indonesia Madiun nomor : SK-PPIM 327 tahun 2024 tentang Penetapan Tim Pelaksana UI Greenmetric World University Rankings Politeknik Perkeretaapian Indonesia Madiun.

Organisasi tim UI Greenmetrics dilakukan dengan Tugas pokok dan Fungsi Tim Pelaksana Pemeringkatan UI GreenMetric World University Rankings Politeknik Perkeretaapian Indonesia

Madiun, sebagai berikut :

a. Menyiapkan seluruh kelengkapan persyaratan administrasi pendaftaran Pemeringkatan UI GreenMetric World University Rankings;
b. Mengumpulkan dan melakukan analisis data yang dibutuhkan berdasarkan kriteria dan indikator penilaian Pemeringkatan UI GreenMetric World University Rankings;
c. Menyusun dokumen yang diperlukan untuk pendaftaran Pemeringkatan UI GreenMetric World University Rankings;
d. Melaksanakan pendaftaran Pemeringkatan UI GreenMetric World University Rankings
e. Menyiapkan kelengkapan yang diperlukan dalam visitasi Pemeringkatan UI GreenMetric World University Rankings;
f. Melayani dan mendampingi asesor dalam visitasi Pemeringkatan UI GreenMetric World University Rankings;
g. Memberikan laporan pelaksanaan Pemeringkatan UI GreenMetric World University Rankings.

Organisasi tim pelaksana dapat dilihat pada gambar berikut.

Dewan Pengarah : 1. Dr. Ir. Efendhi Prih Raharjo, S.T., S.Si.T., M.T.
2. Muhamad Nurhadi, A.T.D., M.TIr.
3. Ir. Akhwan, M.Pd.
4. Windi Nopriyanto, S.ST., M.Sc.

Ketua Pelaksana : Ahmad Wahyudi, A.T.D.

Wakil Ketua : Wahyu Tamtomo Adi, S.T., M.Sc.

Sekretaris : Santi Triwijaya, S.T., M.T.
1. Galih Satria, S.Si, M.Sc.
2. Asri Siswanti

1. Bidang Pengaturan dan Infrastruktur (*Setting and Infrastructure*) : Rinto Astutik, S.Sos., M.M
   1. Abdul Rokhim, S.E., M.Sc.
   2. Mohamad Ripai Zainal Aripin, S.E.
   3. Buyung Septyanto
   4. Achmad Romadhon
   5. Yuyun Wulandari
2. Bidang Energi dan Perubahan Iklim (*Energy and Climate Change*) : Arief Darmawan, S.ST., M.M.
   1. Handoko, S.Pd., M.M.
   2. Iqba Caesar Ad'ha, A.Md. T.
   3. Garrydhian Cahaya Putra, A.Md.T
   4. Muhammad Arfan Safarul Firmansyah, A.Md.T.
   5. Ramadian Derbyandika, A.Md.Tra.
3. Bidang Limbah (Waste) : Ary Putra Iswanto, S.T., M.M.
   1. Adya Aghastya, S.T., M.T.
   2. Muhammad Kesuma Cesarasyid, A.Md.T.
   3. dr. Rasyidafdola Gistadevhadi
   4. Endang Murti Nengsih, A.Md.Tra.
   5. Ns. Adi Tiya Bagus Yulian, S.Kep.
4. Bidang Air (*Water*) : Sunardi, S.Pd., M.Eng.
   1. M. Afif Amalul Arifidin, M.Eng.
   2. Dimas Rangga Sampraba, A.Md.T.
   3. Arik Wijaya, A.Md.T.
   4. Wasis Desti Cindy Syafitri, A.Md.T.
   5. Decha Agil Cipta Putra
5. Bidang Transportasi (*Transportation*) : Nanda Ahda Imron, S.Si.T., M.Sc.
   1. Wawan Riyanta, S.Pd., M.T.
   2. Arinda Leliana, S.Pd., M.T.
   3. Anas Ali Muchson, S.M.
   4. Muhammad Naufal Yunicho Fahrozy, A.Md.T.
6. Bidang Pendidikan dan Penelitian (*Education and Research*) : Puspita Dewi, S.T., M.T.
   1. Alfian Yuda Prasetiyo, S.E., M.M.
   2. Teguh Arifianto, S.Kom., M.T.
   3. Andri Pradipta, S.T., M.T.
   4. Rafi Hafizh Hawari, A.Md.T.
   5. Nurul Hidayah, A.Md.T.
7. Penerjemah Bahasa Inggris : Damar Isti Pratiwi, M.Pd.
   1. Armyta Puspitasari, S.Pd.I., M.Pd.
   2. Dehar Bagas Saefullah, A.Md.T.

Gambar Struktur Organisasi Tim UI Greenmetric PPI Madiun

Setelah organisasi tim ditetapkan, proses perencanaan kegiatan UI Greenmetric dilanjutkan dengan

menyusun timeline kegiatan sebagai berikut.

Tabel Timeline Kegiatan UI Greenmetric

NO	KEGIATAN	PENYELESAIAN
1	Penyusunan SK Tim Pelaksana	6 Agustus 2024
2	Pendaftaran Akun	9 Agustus 2024
3	Penyusunan Dokumen	9 Agustus sd 11 Oktober 2024
4	Self Assemen dan Terjemahan Dokumen	14 Oktober sd 18 Otober 2024
5	Jawab Kuesioner dan Submit Dokumen Bukti	21- 22 Oktober 2024

Perencanaan kebutuhan untuk Penerapan masing-masing Bidang dalam rangka pencapaian skor Dokumen UI GreenMetric World University Rankings di lingkungan Politeknik Perkeretaapian Indonesia Madiun adalah sebagai berikut:

Tabel Kebutuhan Peningkatan untuk Pemeringkatan UI Greenmetric

NO	BIDANG	KEBUTUHAN	JUMLAH
1.	Energi dan Perubahan Iklim	Alat Turbin Angin	1 Pcs
2.	Waste	Bak Sampah 3 Warna/3 Jenis Dengan Ukuran 80 Liter	17 Paket
		Bak Sampah 3 Warna/3 Jenis Dengan Ukuran 120 Liter	11 Pcs
		Bak Sampah Sebagai Dengan Ukuran 660 Liter	6 Pcs
		Kantong Belanja Daur Ulang	100 Pcs
		Poster + Acrilic (Membuang Sampah Pada Tempatnya Sesuai Jenisnya)	50 Pcs
		Poster + Acrilic (Pengurangan Sampah Plastik Dan Kertas)	50 Pcs
		Poster + Acrilic (Penggunaan Tumbler)	50 Pcs
		Poster + Acrilic (Penggunaan Kantong Belanja Daur Ulang)	50 Pcs
		Roll Banner (Membuang Sampah Pada Tempatnya Sesuai Jenisnya)	2 Pcs
		Roll Banner (Pengurangan Sampah Plastik Dan Kertas)	2 Pcs

NO	BIDANG	KEBUTUHAN	JUMLAH
		Papan Nama Lokasi Bank Sampah Ppi Madiun	1 Pcs
		Papan Nama Lokasi Instalasi Pengolahan Air Limbah (Ipal) Ppi Madiun	2 Pcs
		Papan Nama Lokasi Pengolahan Sampah Organik Ppi Madiun	5 Pcs
		Papan Nama Lokasi Pengolahan Sampah Anorganik Ppi Madiun	3 Pcs
		Papan Nama Lokasi Pengolahan Sampah Limbah Cair Dan Beracun Ppi Madiun	2 Pcs
		Stiker Pada Tumbler Air Minum	1000 BUAH
		Pengelolaan Sampah Terpadu Khusus Organik (Teba Modern)	2 Pcs
3.	Transportasi	Marka untuk shuttle (3 titik)	3 Paket
		Banner/Stiker untuk charge station, ada 7 titik tempat charge	7 Pcs
		Perbaikan patrev yang berwarna kuning	1 Paket
		Rambu perhentian shuttle (termasuk peta)	3 Paket
		Rambu batas kecepatan berkendara di dalam kampus	5 Pcs
		Perbaikan marka untuk jalur pesepeda	1 Paket
		Pembersihan trotoar (lumut)	1 Paket
		Rambu penunjuk arah tempat pengisian kendaraan Listrik	2 Pcs
		Pembuatan RAMP	5 Paket
		Sepeda kampus dan shuttle car (dalam kampus) dipasangi *GPS Tracker*	39 Sepeda 2 Shuttle car (patrev kuning dan hiace) 41 *GPS Tracker*
		Aplikasi *GPS Tracker* terpasang di ponsel pengguna (pegawai)	2 Paket
		Mobil antar jemput/bus antar jemput	1 Pcs

NO	BIDANG	KEBUTUHAN	JUMLAH
		atau shuttle bus (diluar kampus) dipasangi *GPS Tracker*	
		Tapping-Gate yang dipasang di gerbang masuk	1 Pcs
		Setiap karyawan menggunakan kartu tapping (*id card*) untuk masuk/keluar kampus	1 Paket sejumlah pegawai
		Carbon monoxide meter	2 Paket
4.	Pendidikan dan Penelitian	Akomodasi kegiatan pembersihan sungai bantaran Kota Madiun	1 Paket
		Peralatan kegiatan pembersihan sungai bantaran Kota Madiun	1 Paket

D. PELAKSANAAN KEGIATAN

1. Pelaksanaan Koordinasi dan Pengisian dokumen

Kegiatan data UI Greenmetric Politeknik Perkeretaapian Indonesia Madiun dilakukan pada tanggal 9 Agustus 2024 s.d 31 Oktober 2024. Kegiatan menyeluruh yang dilakukan diuraikan pada bagian berikut:

a. Rapat Pembahasan UI Greenmetric pada Hari Kamis, tanggal 26 September 2024.
b. Rapat Pengisian dokumen UI Greenmetric dilaksanakan pada hari Selasa, Tanggal 10 September 2024.
c. Proses perbaikan sarana dan prasarana penunjang UI Greenmetric di PPI Madiun.
d. Studi Banding terkait UI Greenmetric di Poltrada Bali pada tanggal 3 sd 6 Oktober 2024.
e. Rapat Finalisasi penyusunan dokumen dilaksanakan pada hari Rabu 16 Oktober 2024.
f. Proses translasi dokumen 17 Oktober sd. 23 Oktober 2024.
g. Rapat pengisian kuesioner dan upload data dukung dilaksanakan pada hari Rabu tanggal 23 Oktober 2024.

2. Hasil Pengisian Data UI Greenmetric

Pada tanggal 23 Oktober 2024, tim UI Greenmetric PPI Madiun mengisi kuesioner pada website UI Greenmetric. Hasil Pengisian tersebut dapat dilihat pada Tabel berikut.

a. Setting & Infrastructure

Question	Answer	Evidence
1.1 Type of higher education institution	Comprehensive Specialized higher education institution	
1.2 Climate	Tropical Wet Tropical Wet and Dry Semiarid Arid Mediterranean Humid Subtropical Marine west coast / Oceanic Climate Humid Continental Subtropik	
1.3 Number of campus site	1	https://docs.google.com/document/d/1oyccGvP97H0ce8ZIacqGG7I5a9aHlbIq/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=t
1.4 Campus setting	Rural Suburban	https://docs.google.com/document/d/1ffFyL3q368CCgDFie22vC

Question	Answer	Evidence
	Urban In city center High rise building	qaZIqkEVGhv/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.5 Total campus area (m2)	183.030 m2	https://docs.google.com/document/d/1E8ErzrmdxBsCf6ewpa5u4gmbKXhXwOV9/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.6 Total campus ground floor area of buildings (m2)	**37.149**	
1.7 Total campus buildings area (m2)	55.155	https://docs.google.com/document/d/1c3z3pOm91vXfpPx5-LlsXAHrr8kganVU/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.8 The ratio of open space to total area. Formula: ((1.5-1.6)/1.5) x 100%)	<= 1% > 1 - 80% > 80 - 90% > 90 - 95% > 95%	https://docs.google.com/document/d/18cneccdECDKyFFHG6DdRahsyZuxNkDLG/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.9 Total area on campus covered in forest vegetation (please provide total area in square meters)	<= 2% number only, please provide total area in meter square > 2 - 9% (5,14%) number only, please provide total area in meter square > 9 - 22% number only, please provide total area in meter square > 22 - 35% number only, please provide total area in meter square	https://docs.google.com/document/d/1td8jAdgpxLontpXDBZILF296V20rmpFv/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	> 35% number only, please provide total area in meter square	
1.10 Total area on campus covered in planted vegetation (please provide total area in square meters)	<= 10% number only, please provide total area in meter square > 10 - 20% (11,4%) number only, please provide total area in meter square > 20 - 30% number only, please provide total area in meter square > 30 - 40% number only, please provide total area in meter square > 40% number only, please provide total area in meter square	https://docs.google.com/document/d/1WhcGGs-n3JOF33WR723-KkdcWym2P3M7/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.11 Total area on campus for water absorption beside forest and planted vegetation (please provide total area in square meters)	● <= 2% number only, please provide total area in meter square ● > 2 - 10% number only, please provide total area in meter square ● > 10 - 20% (10,55%) number only, please provide total area in meter square ● > 20 - 30% number only, please provide total area in meter square	https://docs.google.com/document/d/1qpv7cmxW0G2svexQrxZ80Fk0NwkXcXWq/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	• > 30% number only, please provide total area in meter square	
1.12 Total number of regular students (part time and full time)	632	
1.13 Total number of online students (part time and full time)	0	
1.14 Total number of academic and administrative staff	457	
1.15 The total open space area divided by total campus population. □ Formula: ((1.5-1.6)/(1.12+1.14))	<= 10 m^2 / person > 10 – 20 m^2 / person > 20 – 40 m^2 / person > 40 – 70 m^2 / person > 70 m^2 / person	
1.16 Total university's budget (in US Dollars) □	6.589.528	
1.17 University's budget for sustainability effort (in US Dollars)	5.961.220	https://docs.google.com/document/d/1OYyuwYzM6DYH6QLXEQKzehvSDdzzZgYu/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.18 Percentage Of University's budget for sustainability effort	<= 1% > 1 - 5% > 5 - 10%	

Question	Answer	Evidence
Answer: Formula: ((1.17/1.16) x 100%)	> 10 - 15% > 15%	
1.19 Percentage of operation and maintenance activities of building in one year period	< 25% > 25 - 50% >50 - 75% >75-99% 100%	https://docs.google.com/document/d/1N-cNmI1kzdUJpyRbC4HmdG1kvbDiC7dH/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.20 Campus facilities for disabled and maternity care and are fully operated	• None • Policy is inplace • Facilities are in planning stage • Facilities are partially available and operated • Facilities exist in all buildings	https://docs.google.com/document/d/1CstuV9uHP7E3bxp9_PoI6JtT9OONDdAc/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
1.21 Security and safety facilities	• Passive security system • Security infrastructure (CCTV, emergency hotline/button) available and fully function • Security infrastructure (CCTV, emergency hotline/button, personnel, fire extinguisher, hydrant) available and fully function • Security infrastructure is available and fully functions and security responding time for accidents, crime, fire, and natural disasters is more than	https://docs.google.com/document/d/1EP-KCGLA6NgxrMrstJbmD5y6nZ_wl4L1/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	10 minutes ● Security infrastructure is available and fully functions and security responding time for accidents, crime, fire, and natural disasters is less than 10 minutes	
1.22 Health infrastructure facilities for students and academic and administrative staff wellbeing	● Health infrastructure in preparation (first aid) ● Health infrastructure (first aid, emergency room, clinic and personnel) available Health infrastructure (first aid, emergency room, clinic and certified personnel) available ● Health infrastructure (first aid, emergency room, clinic, hospital and certified personnel) available ● Health infrastructure available (first aid, emergency room, clinic,hospital and certified personnel), system and accessible for public	https://docs.google.com/document/d/1dEpGiwU3NxAqiejitJF-IqllNm3B2cF5/edit?usp=sharing&ouid=101436295972392257796&rtpof=true&sd=true
1.23 Conservation: plant (flora), animal (fauna), and wildlife, genetic resources for food and agriculture secured in either medium or long-	● Conservation program in preparation ● Conservation program 1-25% implemented ● Conservation program > 25-50% implemented ● Conservation program > 50-75%	https://docs.google.com/document/d/1pY9ANHIX36JBrcx-SkWC38idfdSH0B_o/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
term conservation facilities	implemented ● Conservation program >75% implemented	
1.24 Planning, implementation, monitoring and/or evaluation of all programs related to Setting and Infrastructure through the utilization of Information and Communication Technology (ICT) (new)	● The program is currently in the planning stage ● Program has been implemented ● Program has been implemented and evaluated ● Program has been implemented, evaluated, and is currently revised	**https://docs.google.com/document/d/1QTjZs9ZNxI1LGcjYs2GsWKzjPRNIvhoKpN6cnefl-pc/edit?usp=drive_link**

b. Energy & Climate Change

Question	Answer	Evidence
b.1 Energy efficient appliances usage	< 1% 1 - 25% > 25 - 50% > 50 - 75% > 75%	https://docs.google.com/document/d/1kKwnoe75msd45yAIsqxkhIUSo6KsKwwJ/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
b.2 Total campus smart building area (m2)	55.155	
b.3 Smart Building implementation (percentage of the total floor area of smart building to the total all floors building area (smart and non-smart buildings area). Formula: ((2.2/1.7) x 100%)	< 1% 1% - 25% > 25% - 50% > 50% - 75% > 75%	https://docs.google.com/document/d/1rUUspbDelPSxvL9bwT3ppZKOTjAaCw12/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
b.4 Number of renewable energy sources in campus (solar power, biodiesel, wind power, etc)	None 1 source 2 sources 3 sources >3 sources	
b.5 Renewable energy sources and their amount of the energy produced (in kilowatt-hour) ℹ	Not Applicable B[2] Bio Diesel: 30000 kWh [4] Solar Power: 3468 kWh	https://docs.google.com/document/d/1kA2QCbgkrocR_5o_nkFnPnXPSaLjWRJ/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	[5] Wind Power: 35293 kWh	
b.6 Electricity usage per year (in kilowatt hour)	Pada tahun 2023 penggunaan energy listrik pada PPI Madiun sebesar = 2.008.880 KWh Jumlah Pegawai, Peserta Diklat dan Mahasiswa PPI Madiun Pada tahun 2023 sebanyak = 1089 Orang 1844 kwh	https://docs.google.com/document/d/174DGzwzj1RSE8qi1K9RyThq_nBPZZqMR/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
b.7 The total electricity usage is divided by total campus population (kWh per person). Formula: ((2.6)/(1.12+1.14))	>=2424 kWh >1535 - 2423 kWh >633 - 1535 kWh 279 - 633 kWh <279 kWh	
b.8 The ratio of renewable energy production divided by total energy usage per year	<= 0.5% > 0.5 - 1% > 1 - 2% > 2 - 25% > 25%	https://docs.google.com/document/d/1on_XdGXvg4bNWf6hAelZMj6FDZBk91Dl/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
b.9 Elements of green building implementation as reflected in all construction and renovation policies	None 1 element 2 elements 3 elements >3 elements	https://docs.google.com/document/d/12zS27X3jZuU8nRmWCW3e_8nmCgOTMSSu/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
b.10 Greenhouse gas emission reduction program	• None (reduction program is needed, but nothing has been done)	https://docs.google.com/document/d/1OhftVdRokaXlbtfgm2eUGuMwKuWdN6Nd/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	• Program in preparation • Program(s) aims to reduce one out of three scopes emissions (Scope 1 or 2 or 3) • Program(s) aims to reduce two out of three scopes emissions (Scope 1 and 2 or Scope 1 and 3 or Scope 2 and 3) • Program(s) aims to reduce all three scopes emissions (Scope 1, 2 and 3)	
b.11 Please provide the total carbon footprint (CO_2 emission in the last 12 months, in metric tons)	Total Karbon yang dihasilkan : Populasi 1694,25	https://docs.google.com/document/d/11OEMtd0UmR7_3N4c7OhJwKl5TP7wZZMa/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
b.12 The total carbon footprint divided by total campus population (metric tons per person) Formula: ((2.11)/(1.12+1.14))	>= 2.05 metric tons >1.11 - 2.05 metric tons >0.42 - 1.11 metric tons >0.10 - 0.42 metric tons < 0.10 metric tons	
b.13 The number of innovative program(s) in Energy and Climate Change	None 1 program 2 programs 3 programs.	https://docs.google.com/document/d/1COUXSf5DVm6nsXcAwN7BLC25FltGtFqT/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	More than 3 programs	
b.14 Impactful university program(s) on climate change	• None • Program in preparation • Provide training, educational materials, seminars/conferences, and activities which are implemented by surrounding communities • Provide training, educational materials, seminars/conferences, and activities which are implemented by communities at the national level • Provide training, educational materials, seminars/conferences, and activities which are implemented by communities at the	https://docs.google.com/document/d/1GQ5-PIGWChpynoGygsMNJOV8Ylyw_eJi/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
	international level	
b.15 Planning, implementation, monitoring and/or evaluation of all programs related to Energy and Climate Change through the utilization of Information and Communication Technology (ICT) (new)	• None • The program is currently in the planning stage Program has been implemented • Program has been implemented and evaluated • Program has been implemented, evaluated, and is currently revised	https://docs.google.com/document/d/1nV4oN-RtJdvrwlQ2pz6J2yc66nNvUj3Q/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

c. Waste

Question	Answer	Evidence
c.1 3R (Reduce, Reuse, Recycle) program for university's waste	• 3R program in preparation • 3R program 1-50% implemented • 3R program > 50 - 75% implemented • 3R > 75% implemented	https://docs.google.com/document/d/12a19sar0KePiq_A-A_rOej6toRGcLJkt7Dm4t3lUWjI/edit?usp=drive_link
c.2 Program to reduce the use of paper and plastic on campus	1-3 programs 4-6 programs 7-10 programs More than 10 programs	https://docs.google.com/document/d/1sZRhYBRT0GZz7uyov2g76Gp1nefN4IkSYPn7K4zj2U8/edit?usp=drive_link

Question	Answer	Evidence
c.3 Total volume organic waste produced (ton)	- food waste: 2,6 ton - leaf: 40,14 ton Total 42.74	https://docs.google.com/document/d/11ZkUm0n9Qt4hstRHdWLKKRxkh9Qmiz3RzQkaQwm8l0Y/edit?usp=drive_link
c.4 Total volume organic waste treated (tons)	- food waste: 1,5 - leaf: 31,08 Total 32,58	https://docs.google.com/document/d/1qhOp0SBPJL8hj8r2kxwLvKj1DolJY9ZUjt7Jc10Ip8M/edit?usp=sharing
c.5 Organic waste treatment	Partial (1-35% treated) Partial (> 35 - 65% treated) Partial (> 65 - 85% treated) Extensive (>85 % treated)	https://docs.google.com/document/d/1QbfFhmhmdmk4FWwDFYkBTX-tNY2YbLQV724L3xSUL90/edit?usp=drive_link
c.6 Total volume inorganic waste produced (tons)	- plastik botol: 3584,02 - plastik makanan: 3168,01 - kertas/karton: 2764,16 - besi: 122,75 Total: 9638,94	https://docs.google.com/document/d/1BMQAOxqZwWzOV3Qg6iHBwxieegTjnRExWVAU0tCIFac/edit?usp=drive_link
c.7 Total volume inorganic waste treated (tons)	-inorganic non-toxic: 1236 - plastik botol: 100 - plastik makanan: - kertas/karton: 1136 - besi: - Total: 2472 Persentase: 25,69%	https://docs.google.com/document/d/1ffbDRFvZdgGcxC6iP29tHni0oP6fNKgo_jhapVQGDmg/edit?usp=drive_link
c.8 Inorganic waste treatment	Burned in the open Partial (1-35% treated) Partial (>35-65% treated) Partial (>65-85% treated)	https://docs.google.com/document/d/1QH-Arrfuwk4Hkn_VFdLbHH90mkUW2Hg94yJ5p1Hiwn8/edit?usp=drive_link

Question	Answer	Evidence
	Partial (>85% treated)	
c.9 Total volume toxic waste produced (tons)	5.6517	https://docs.google.com/document/d/1eK71NbuVjHZSXqyld7gzm9dLb2_Vw13M6HnoX7CbeaU/edit?usp=drive_link
c.10 Total volume toxic waste treated (tons)	4,2	https://docs.google.com/document/d/15mZiFBf8gaaehsYnSb1e7nzGhu5sveCUdz74CjsNqmM/edit?usp=drive_link
c.11 Toxic waste treatment	Non Managed Partial (1-35% treated) Partial (>35-65% treated) Partial (>65-85% treated) Partial (>85% treated) or campus produces a minimum amount of toxic waste	https://docs.google.com/document/d/1LVqMPqbzqlIoWVuqKGDgvrFt-WkZ7bTb3H_glmXFVpM/edit?usp=drive_link
c.12 Sewage disposal	• treated with preliminary treatment • treated with primary treatment • treated with secondary treatment • treated with tertiary treatment	https://docs.google.com/document/d/1MR2gPyYx9yHeB49r5ZswDnuulN1uN6PzjhEQYAEw7u4/edit?usp=drive_link
c.13 Planning, implementation, monitoring and/or evaluation of all programs related to Waste Management through the	• None • the program is currently in the planning stage • program has been implemented • program has been implemented and evaluated • program has been implemented,	https://docs.google.com/document/d/1si69h0YcjoBaNvg3WNSgRICCR9-hPZZ_vEa0yniZsRo/edit?usp=drive_link

Question	Answer	Evidence
utilization of Information and Communication Technology (ICT) (new)	evaluated, and is currently revised	

d. Water

Question	Answer	Evidence
4.1 Water conservation program and implementation	none program in preparation 1-25% water conserved >25-50% water conserved >50% water conserved	https://docs.google.com/document/d/1WiQeubFnVcQGJY8cX5A121MCj-UpbkZD-PXNB1AABf4/edit?usp=drive_link
4.2 Total campus smart building area (m2)	none program in preparation 1-25% water recycled >25-50% water recycled >50% water recycled	https://docs.google.com/document/d/11ZT8aJlJc5N9gE4hDiqCDf2d8WKv4Xe0MUByOlJLjBI/edit?usp=drive_link
4.3 Water efficient appliance usage	< 20% of water efficient appliances installed 20 - 40% of water efficient appliances installed > 40 - 60% of water efficient appliances installed > 60-80% of water efficient appliances installed > 80% of water efficient appliances installed	https://docs.google.com/document/d/1W8zbGXHr8A6ULMUMKBxCD01VX07kUpIvevvkglsQDvA/edit?usp=drive_link
4.4 Consumption of treated water	none 1 - 25% treated water consumed > 25 - 50% treated water consumed > 50 - 75% treated water consumed > 75% treated water consumed	https://docs.google.com/document/d/16TvyFnpGi4M2_-f1RroEDNFXF26nb4CUdI0KCnUGifE/edit?usp=drive_link
4.5 Water pollution control in campus area	-policy and programs for water pollution control are in the designing stage	https://docs.google.com/document/d/16bNvL46XIoxdPLTFVHObXc-VclgF1TyTVR1jb37Ajig/edit?usp=drive_link

Question	Answer	Evidence
	-policy and programs for water pollution control are in the construction stage -policy and programs for water pollution control are in the early implementation stage -policy and programs for water pollution are fully implemented and monitored occasionally -policy and programs for water pollution control are fully implemented and monitored regularly	
4.6 Planning, implementation, monitoring and/or evaluation of all programs related to Water Management through the utilization of Information and Communication Technology (ICT) (new)	-none -the program is currently in the planning stage -program has been implemented -program has been implemented and evaluated -program has been implemented, evaluated, and is currently revised	**https://docs.google.com/document/d/1uB6gMRIMAoGFxDdYOSV2G1sLVP9VW2OUL-jcLEh6N_Q/edit?usp=drive_link**

e. Transportation

Question	Answer	Evidence
5.1 Number of cars actively used and managed by University	**22**	
5.2 Number of cars entering the university daily	20	
5.3 Number of motorcycles entering the university daily	137	
5.4 The total number of vehicles (cars and motorcycles) divided by total campus population.	≥ 1 > 0.5 - 1 > 0.125 - 0.5 > 0.045 - 0.125 < 0.045	https://docs.google.com/document/d/1fT4z3lxn2CEt_r2jqw6-orhK8tBeqUbv/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
5.5 Shuttle service	• Possible but not provided by university • Provided (by university or other parties) and regular but not free • Provided (by university or other parties) and the university contributes a part of the cost • Provided by university, regular, and free • Provided by university, regular, and zero emission vehicle. Or shuttle use is not applicable	https://docs.google.com/document/d/1xT84AfKC8GJCPDRWsw8SiteeymallCB2/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
5.6 Number of Shuttles operated in your university	2	
5.7 Average number of passengers of each shuttle	6	
5.8 Total Trips of shuttle services each day	12	
5.9 Zero Emission Vehicles (ZEV) policy on campus	• ZEV are not available • ZEV use is not possible or practical • ZEV are available, but not provided by the university • ZEV are available, provided by the university and charged • ZEV are available, and provided by the university for free	https://docs.google.com/document/d/1RPv2JvLQC1pmgfyr6CAJrFou8_y44CkL/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
5.10 Average of number of Zero Emission Vehicles (e.g bicycle, cano, snowboard, electric car, etc.) on campus per day □	40	
5.11 The total number of Zero Emission Vehicles (ZEV) divided by total campus population	≤ 0.002 > 0.002 - 0.004 > 0.004 - 0.008 > 0.008 - 0.02 > 0.02	https://docs.google.com/document/d/1J_6naXQi9JTSXZRY7RrpeyK_-U6tTdRj/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
5.12 Total Ground Parking area (m2)	1000m2	
5.13 Ratio of parking area to total campus area.	> 11% > 7 - 11 % > 4 - 7 % > 1 – 4 % < 1%	https://docs.google.com/document/d/1iUqaJKg2n14Rw3sfN91IyJ-WV-q9oUdS/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true

Question	Answer	Evidence
5.14 Transportation program designed to limit or decrease the parking area on campus for the last 3 years (from 2021 to 2023)	• None • In preparation • Less than 10% decrease • in parking area 10 - 30% decrease in parking area • More than 30% decrease in parking area or parking area reduction reaching its limit	https://docs.google.com/document/d/19ndWdN-xWI3rMeV837E_-lBjrbwWXGwz/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
5.15 Number of initiatives to decrease private vehicles on campus	• No initiative • 1 initiative • 2 initiatives • 3 initiatives • > 3 initiatives, or initiative is no longer required	https://docs.google.com/document/d/1mo4hfBJZeKAtN4R7jk5JTxBdzsOwQTSg/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
5.16 Pedestrian path on campus	• None • Pedestrian paths are available • Pedestrian paths are available, and design for safety • Pedestrian paths are available, designed for safety and convenience • Pedestrian paths are available, designed for safety, convenience, and in some parts provided with disabled-friendly features	https://docs.google.com/document/d/15WeasVBmCCMFY0X6bG5eaUu6IFOhe1Pn/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true
5.17 Approximate daily travel distance of a vehicle inside campus only (in Kilometers)	12	
5.18 Planning, implementation, monitoring and/or evaluation of	a. Activities/Programs Planning :	https://docs.google.com/document/d/1JB9AxZm7VqbPcmsjPQi1vn3fEdbKFEvV/edit?usp=drive_link&ouid=101436295972392257

Question	Answer	Evidence
all programs related to Transportation through the utilization of Information and Communication Technology (ICT) (new)	1. Detect the location of campus' bicycle 2. Detect the location of shuttle car (inside campus) 3. Detect the location of shuttle car/shuttle bus (outside campus) Implementation : Procurement of GPS Tracker as needed Monitoring : by usage Evaluation : Evaluate shuttle service efficiency b. ICT Utilization Planning : 1. GPS Tracker 2. Campus' bicycle 3. Application 4. GPS Tracker 5. Shuttle car 6. Application 7. GPS Tracker 8. shuttle car/shuttle bus Implementation : GPS Tracker Monitoring : Real-time tracking software Evaluation : Data analysis tools, user feedback surveys	**7796&rtpof=true&sd=true**

f. Transportation

Question	Answer	Evidence
6.1 Number of courses/subjects related to sustainability offered	**84 Mata Kuliah**	**https://docs.google.com/document/d/1Ma_9IKxfEIncCMGwfNs4qO2oZq30ebmX/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true**
6.2 Total number of courses/subjects offered	A. Perbandingan Jumlah Mata Kuliah Program Studi Jumlah Seluruh Mata Kuliah : 192 Jumlah Mata Kuliah Sustainability : 84 Kurikulum yang digunakan dalam periode 3 (Tiga) tahun kebelakang belum mengalami perubahan, hal ini dikarenakan Politeknik Perkeretaapian Indonesia Madiun menerapkan kurikulum tahun 2020 selama kurun waktu tersebut. B. Perbandingan Jumlah Jenis Diklat Daftar Seluruh Diklat : Tahun 2021 : 53 Tahun 2022 : 53 Tahun 2023 : 67 Diklat Terkait Sustainability Tahun 2021 : 41 Tahun 2022 : 41 Tahun 2023 : 55 Pelatihan yang ditawarkan terkait dengan sustainability pada tahun 2023	**https://docs.google.com/document/d/1pnaJoZQk2pwLRBgUFKZeff8PIoSCoRml/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true**

Question	Answer	Evidence
	telah meningkat dibandingkan dengan tahun-tahun sebelumnya. Hal ini merupakan wujud	
6.3 The ratio of sustainability courses to total courses/subjects Formula: ((6.1/6.2) x 100%)	≤ 1% > 1 - 5% > 5 - 10% > 10 - 20% > 20%	
6.4 Total research funds dedicated to sustainability research (in US Dollars) (average per annum over the last 3 years).	Total dana penelitian tentang penelitian yang berkelanjutan tahun 2022 = 2.101,25 US Dollars Total dana penelitian tentang penelitian yang berkelanjutan tahun 2023 = 16.123,03 US Dollars Total dana penelitian tentang penelitian yang berkelanjutan tahun 2024 = 8.548,92 US Dollars Rata-rata Rata-rata dana penelitian dalam tiga tahun tentang penelitian yang berkelanjutan = 8.924,4 US Dollars	**https://docs.google.com/document/d/1rckJlLSg4hISlAgUHztdtwiQPi0GO-eS/edit?usp=sharing&ouid=101436295972392257796&rtpof=true&sd=true**
6.5 Total research funds (in US Dollars) (average per annum over the last 3 years).	Total dana penelitian tahun 2022 = 118.216,34 US Dollars Total dana penelitian tahun 2023 = 168.091,77 US Dollars Total dana penelitian tahun 2024 = 36.168,51 US Dollars Rata-rata Rata-rata dana penelitian dalam tiga tahun tentang penelitian yang berkelanjutan = 107.492,2 US Dollars	**https://docs.google.com/document/d/15WkPRpuTStx4NOcIRjVpDf2WIOsrb1TMpvhwIGP_vkg/edit?usp=drive_link**

Question	Answer	Evidence
6.6 The ratio of sustainability research funding to total research funding. Formula: ((6.4/6.5) x 100%)	<= 1% > 1 - 10% > 10 - 20% > 20 - 40% > 40%	
6.7 Number of scholarly publications on sustainability published. (average annually for the past 3 years)	0 1 – 20 21 – 83 84 - 300 > 300 **Total 22 Publikasi**	**https://docs.google.com/document/d/1WO7SkS9DV7njNqob_zVbT85912irSwCJHSOeHDniwwU/edit?usp=drive_link**
6.8 Number of events related to sustainability. (average annually for the past 3 years)	0 1 - 5 6 - 20 21 - 50 > 50	**https://docs.google.com/document/d/1KrrXFuff-mA_T3q2_pvp7k1vFwOvOMHuhfgBWP29OOU/edit?usp=drive_link**
6.9 Number of activities organized by student organizations related to sustainability per year	0 1 – 5 6 - 10 11 - 20 > 20	**https://docs.google.com/document/d/1SpGFFf5Lqk9k1mQxUjLyIQE5TnjHFuXRMO2lq-z0GNU/edit?usp=drive_link**
6.10 University-run sustainability website	Not available Website in progress or under construction Website is available and accessible Website is available, accessible, and updated occasionally Website is available, accessible, and updated regularly	
6.11 Sustainability website address (URL) if available	http://ppi.ac.id	

Question	Answer	Evidence
6.12 Sustainability report	Not available Sustainability report is in preparation Available but not publicly accessible Sustainability report is accessible and published occasionally Sustainability report is accessible and published annually	https://docs.google.com/document/d/1Kg0xw2JlZpG6GGY8bFyjvpFniGWsDLTN1xT9trdVGPo/edit?usp=drive_link
6.13 Sustainability report link address (URL) if available	https://shorturl.at/JDBFK	https://shorturl.at/JDBFK
6.14 Number of cultural activities on campus	None 1 - 3 events per year 4 - 6 events per year 7 - 10 events per year More than 10 events per year	https://docs.google.com/document/d/1QvAMctDUcvBzfCDINRD3xaO1kD5cPdpnYO6s2ImU72w/edit?usp=drive_link
6.15 Number of university program(s) with international collaborations	None 1 - 3 events per year 4 - 6 events per year 7 - 10 events per year More than 10 events per year	https://docs.google.com/document/d/1cmPiqzIxzETs_XJq10LeKuDJRVosiPaGVdlfc6mEdNE/edit?usp=drive_link
6.16 Number of community services related to sustainability organized by university and involving students	None 1 - 3 projects per year 4 - 6 projects per year 7 - 10 projects per year More than 10 projects per year	https://docs.google.com/document/d/1VXE_QZKJrAcAER6kNfuT_K4Vr4b6rOPpVm8KBgjeQ5o/edit?usp=drive_link
6.17 Number of sustainability-related startups	None 1 – 5 startups 6 – 10 startups 11 – 15 startups More than 15 startups	https://docs.google.com/document/d/1pp8K9tzF6i-oEqQ2QDZWoivhMO7dTAkwxkwDXrZeUi4/edit?usp=drive_link
6.18 Total number of graduates with green jobs (for the last 3	250	https://docs.google.com/document/d/1TSMcbKPVUHBU6Zoxldn7f0IZdtNogeMLVdPj-NBh-HI/edit?usp=drive_link

Question	Answer	Evidence
years) (new)		
6.19 Availability of units or offices that coordinate or are related to sustainability (new)	● Ad-hoc / task force ● Unit(s) or office(s) in development ● Unit(s) or office(s) with university leader decree of establishment, structure and duties at early stage ● Unit(s) or office(s) with university leader decree of establishment, structure and duties has been operational ● Unit(s) or office(s) with university leader decree of establishment, structure and duties has been operational and lead the university implementation of sustainability	**https://docs.google.com/document/d/1Cz3movzP7Dt1BCh7Wi1L4wxVP9dvwEYJC9G3qBq1wSA/edit?usp=drive_link**
6.20 Planning, implementation, monitoring and/or evaluation of university governance through the utilization of Information and Communication Technology (ICT) (new)	● None ● The program is currently in the planning stage ● Program has been implemented ● Program has been implemented and evaluated ● Program has been implemented, evaluated, and is currently revised	**https://docs.google.com/document/d/1OJGveF5U9F0D45ExSyuAbJrDBNpS7XiA/edit?usp=drive_link&ouid=101436295972392257796&rtpof=true&sd=true**

3. Simulasi Penilaian dari Hasil Pengisian Kuesioner UI Greenmetric

Pada Rapat finalisasi dokumen dan penilaian hasil kuesioner UI Greenmetric pada hari Rabu tanggal 16 Oktober 2024, Hasil pengisian dan simulasi penilaian dapat dilihat pada Tabel berikut.

Kriteria	Total Score	Maksimal Score	Persentase ketercapaian	Pembobotan tiap kriteria %	Total sesuai pembobotan
1. Setting and Infrastructure	900	1500	60%	15%	135
2. Energy & Climate Change	1.060	2100	50%	21%	222.6
3. Waste	1.350	1800	75%	18%	243
4. Water	500	1000	50%	10%	50
5. Transportation	1.425	1800	79%	18%	256.5
6. Education and Research	950	1800	53%	18%	171
Total	6.185	10000	62%	100%	1078.1

Berdasarkan pemeringkatan UI Greenmetric pada tahun 2023, jika hasil penilaian dari asesor UI Greenmetric sesuai dengan hasil simulasi ini maka PPI Madiun yang disimulasikan mendapatkan nilai 6.185 dapat memperoleh peringkat 1000 besar di world ranking university. Pada tahun 2023 untuk mendapatkan peringkat 1000 dibutuhkan skor minimal 3.500.

994	Kharkiv National University of Radio Electronics Ukraine, Europe	3630	600	910	300	160	685	975
995	National University of Water And Environmental Engineering Ukraine, Europe	3630	475	785	675	160	835	700
996	UNIVERSITY OF EASTERN PHILIPPINES Philippines, Asia	3620	850	515	300	10	1085	860
997	University of Fallujah Iraq, Asia	3610	600	415	375	360	1160	700
998	Northern University, Nowshera Pakistan, Asia	3600	815	990	300	210	610	675
999	Università di Foggia Italy, Europe	3580	410	890	1050	210	210	810
1000	Cankaya University Turkiye, Europe	3575	715	500	525	160	775	900
1001	Nakhon Ratchasima Rajabhat University Thailand, Asia	3560	465	785	825	250	285	950

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E. EVALUASI DAN REKOMENDASI

Berdasarkan hasil rapat penyusunan, pengisian dokumen, dan identifikasi terhadap kondisi eksisting penerapan keberlanjutan kampus di PPI Madiun, dapat disimpulkan bahwa belum seluruh faktor yang menjadi penilaian pada UI Greenmetric telah dilaksanakan sepenuhnya oleh PPI Madiun. Setiap unsur penilaian pada UI Greenmetric perlu menjadi perhatian bagi kegiatan pengelolaan dan pengembangan kampus PPI Madiun selanjutnya.

Berdasarkan hal tersebut, ada beberapa masukan terkait bagian-bagian yang menjadi penilaian bagi pemeringkatan UI Greenmetric di masa yang akan datang, antara lain:

a. Pengelolaan Infrastruktur
    - Perlu penerapan monitoring dan evaluasi terkait infrastruktur di PPI Madiun dengan menggunakan teknologi informasi dan komunikasi yang terkait.
    - Anggaran untuk pelaksanaan kegiatan untuk keberlanjutan kampus perlu diberikan alokasi tambahan.
b. Pengelolaan Energi
    - Perlu menambahkan sumber energi alternatif di PPI Madiun seperti tenaga surya untuk gedung-gedung.
    - Perlu mengimplementasikan SMART building pada perencanaan pembangunan dan perawatan infrastruktur di masa mendatang.
c. Pengelolaan Air
    - Perlu pengolahan dan pengelolaan lebih lanjut dari persediaan air yang bukan berasal dari air tanah agar dapat dimanfaatkan untuk kebutuhan di PPI Madiun, misalnya untuk penyiraman, cuci mobil, dsb.
d. Pengelolaan Transportasi
    - Perlu perawatan dan pengaktifan kembali sistem shuttle di dalam kampus dengan kendaraan listrik.
    - Penyediaan infrastruktur untuk pengisian listrik kendaraan.
    - Perlu pemanfaatan teknologi dan informasi untuk pengelolaan transportasi di lingkungan kampus, misalnya dengan monitoring GPS pada kendaraan kantor.
    - Dalam pengadaan kendaraan dinas berikutnya, perlu mempertimbangkan aspek ramah lingkungan, misalnya kendaraan dinas listrik/hybrid.
e. Pengelolaan Sampah
    - Perlu adanya kegiatan peningkatan karakter peduli sampah
    - Perlu adanya pelatihan pengelolaan sampah

- Perlu adanya komitmen dan kesadaran dalam pengurangan sampah
- Perlu adanya penambahan peralatan dan perlengkapan pendukung penanganan sampah.

f. Pengelolaan Pendidikan dan Penelitian
    - Perlu dilaksanakan kegiatan terkait budaya, pendidikan, dan pengabdian masyarakat secara lebih rutin dengan mempertimbangkan aspek lingkungan.
    - Penelitian dan pengabdian sedapat mungkin mengangkat tema yang terkait keberlanjutan.

F. PENUTUP

Semua pihak dalam kepanitian UI Greenmetric telah melaksanakan tugas dan tanggung jawabnya sehingga kegiatan dapat dilaksanakan dengan baik dan selesai pada waktu yang diharapkan. Sehingga proses pemeringkatan UI Greenmetric telah selesai dilaksanakan.

Laporan kegiatan ini disusun sebagai dokumentasi bagi pelaksanaan kegiatan penyusunan dokumen, pemenuhan bukti dukung, dan pengisian kuesioner untuk pemeringkatan UI Greenmetric. Laporan ini dapat menjadi acuan bagi pelaksanaan kegiatan di masa yang akan datang, dan menjadi acuan bagi pengembangan kampus di PPI Madiun agar dapat menerapkan prinsip-prinsip keberlanjutan dalam pelaksanaan kegiatan pendidikan, penelitian dan pengabdian masyarakat.

DOKUMENTASI KEGIATAN

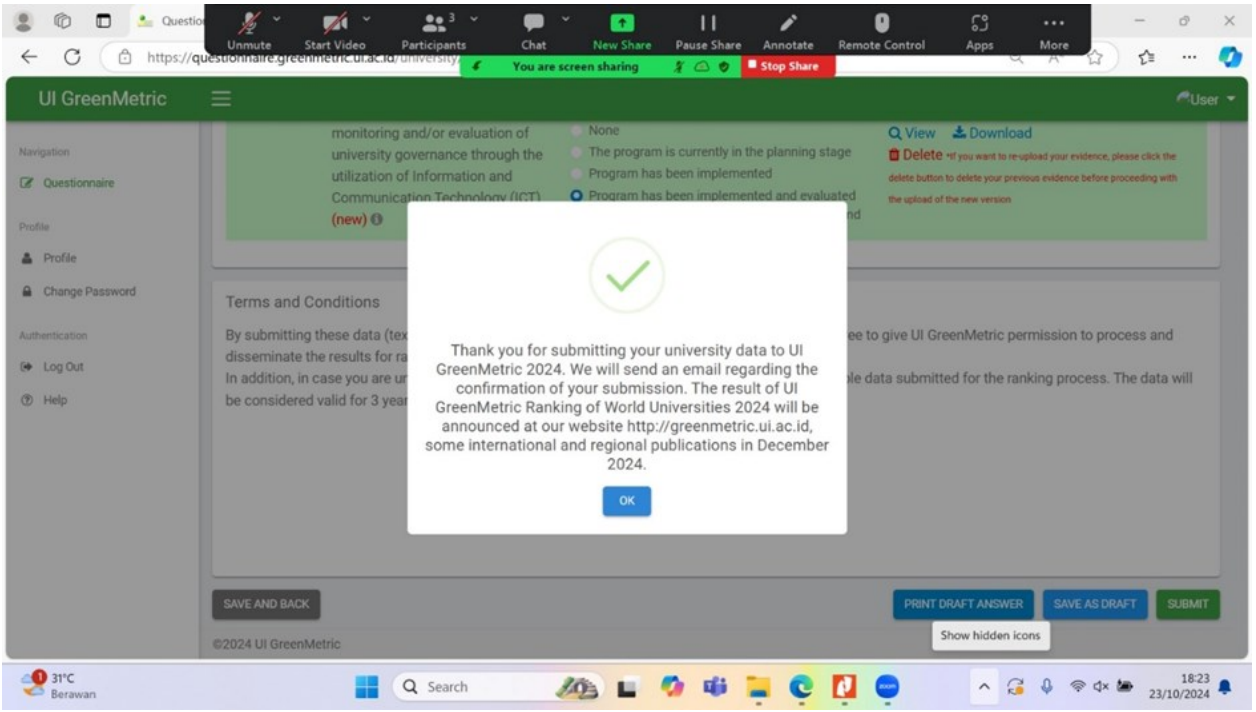
Dokumentasi Rapat Persiapan Pemeringkatan Dokumen UI GreenMetric pada 10 September 2024

Dokumentasi Rapat Penyusunan Dokumen UI GreenMetric pada 26 September 2024

Dokumentasi Rapat Finalisasi Penyusunan Dokumen UI GreenMetric pada 16 Oktober 2024

Dokumentasi Rapat Pengisian Kuesioner UI GreenMetric pada 16 23 Oktober 2024

Dokumentasi bukti upload Dokumen UI Greenmetric World University Rankings Politeknik Perkeretaapian Indonesia Madiun pada tanggal 23 Oktober 2024



LAMPIRAN SK PANITIA KEGIATAN

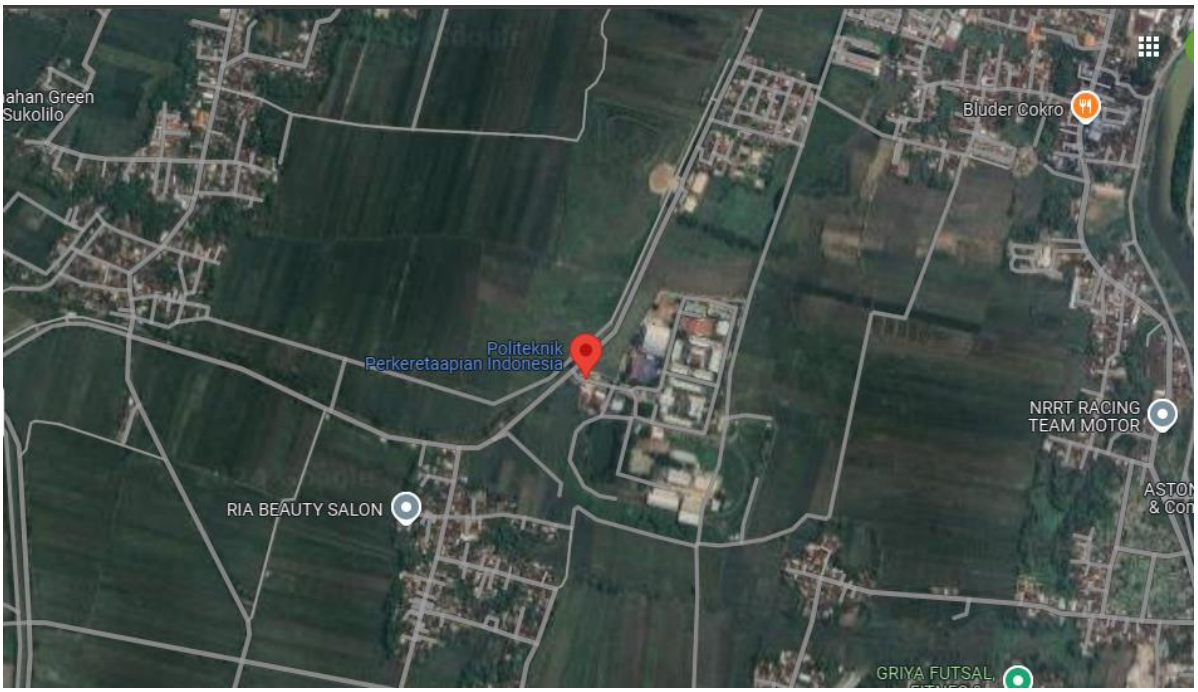
LAMPIRAN DOKUMEN PENDUKUNG

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.4] Campus Setting



Campus Setting - The Main Campus of Indonesian Railway Polytechnic

Description:
Description
PPI Madiun is located in Kejuron Village, Jalan Tirta Raya, Manguharjo District, Madiun City - East Java, with an area of 183,080 m². Geographically, to the west is Mount Lawu and to the southeast is Mount Wilis. The distance between PPI Madiun and Madiun City Center is ± 4 km, the only vocational school in Madiun City.

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.5] Total Campus Area

Total Campus of Indonesian Railway Polytechnic Area

Description:
Description
The Main Campus of Indonesian Railway Polytechnic
Total Area : 183.080 m²

Several photos of PPI Madiun campus site can be seen on this Additional evidence link:
https://drive.google.com/drive/folders/1yR2qUneSNIgPUKMA5fBqddyX1Pqapjc-?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.7] Total campus buildings area

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Office Buildings</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Dormitory</td><td>Polyclinic</td></tr>
</table>

<table>
<tr><td>  </td><td> 
</td></tr>
<tr><td colspan="2">Classrooms and Laboratories</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Mosque</td><td>Other Buildings</td></tr>
</table>

Description:

Building name	Total Area
Dormitory	13.949 m²
Auditorium	7.438 m²
Office Building	10.618 m²
Polyclinic	617 m²
Classrooms and Laboratories	12.582 m²
Mosque	1.705 m²
Other buildings	2.824 m²
Total	55.155 m²

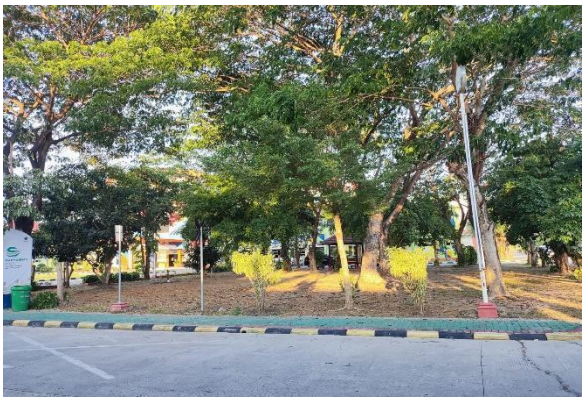
Some pictures of the buildings can be seen on the additional evidence link:
https://drive.google.com/drive/folders/1JVEO1DMRiwuY8-yZCPC6VV-VQnY3IUxO?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.8] The ratio of open space area to total area



The ratio of open space area to total area

Description:

Total Area : 183.080 m²
Total ratio of open space area : 98.245 m²
Percentage Area : 53.66 %

The PPI Madiun has an open space ratio of 53% of its total land area, which shows that more than half of the campus area is dedicated to open space. This reflects the institution's commitment to creating a green, healthy, balanced environment for all civitas academics.

With this significant proportion of open space, PPI Madiun provides various outdoor facilities that support recreation, learning activities, and campus community development. This open space includes green parks, pedestrian paths, and other green areas which not only beautify the campus environment, but also plays an

important role in supporting ecological functions, such as absorbing rainwater, improving air quality, and providing habitat for local flora and fauna.

Apart from the ecological benefits, this large open space also provides social and recreational benefits, where students and staff can use it to relax, exercise, or simply enjoy a more open and natural atmosphere. The percentage of open space of 53% shows a good balance between campus infrastructure development and environmental preservation, creating an atmosphere that supports physical and mental health as well as increasing productivity and comfort for the entire PPI Madiun academic community.

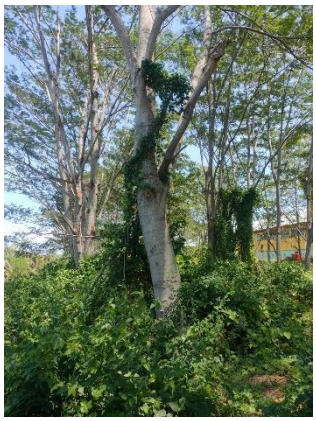
Some pictures of open spaces are available on additional evidence link:
https://drive.google.com/drive/folders/1mb166dyuq9vb2nsJNcI13JEZHBS2XYmV?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.9] Total area on campus covered in forest vegetation

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Sengon Forest</td><td>Sengon Forest</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">Total area on campus covered in forest vegetation</td></tr>
</table>

Description:
The PPI Madiun Campus is located in a rural area surrounded by natural forest vegetation and rice fields. This condition can potentially support the participation of the PPI Madiun in building a sustainable university for the global community.

Total Area : 183.080 m²
Area on campus covered in forest vegetation : 9428.2 m²
Percentage : 5.14 %

The PPI campus area has a ratio of 5.14% of its total land area covered by sengon forest. This sengon forest is planted with sengon trees (Albizia chinensis), a fast-growing tree often used in reforestation, reforestation and

light wood production programs. The existence of the sengon forest on campus has several important benefits, including:

1. Ecological Function: Sengon trees help improve the quality of the environment around campus by absorbing carbon dioxide and producing oxygen. In addition, sengon forests can function as windbreaks, reduce air pollution, and provide habitat for various types of local fauna.

2. Conservation and Biodiversity: Although sengon is a relatively uniform tree species, the forest area still helps maintain vegetation diversity and provides a home for various animal species. This contributes to environmental conservation and maintains the balance of the ecosystem on campus.

3. Water Absorption and Erosion Prevention: The robust root system of the sengon tree helps absorb rainwater and prevents soil erosion. This is very important to maintain the stability of the land around the campus, especially in areas that may be vulnerable to flooding or landslides.
4. Educational and Research Function: The presence of the sengon forest at PPI Madiun also has the potential to be a learning tool for students, especially those related to the environment, conservation of land management. This forest can be used as a natural laboratory for studying reforestation practices and environmental management.

PPI Madiun is committed to reforestation efforts and sustainable environmental management, with 5.14% of the campus area dedicated to the sengon forest. This provides benefits not only in terms of ecology but also in terms of aesthetics, social, and academics for the campus academic community.

Some pictures of forest vegetation are available on additional evidence link:
https://drive.google.com/drive/folders/1yR2qUneSNIgPUKMA5fBqddyX1Pqapjc-?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.10] Total area on campus covered in planted vegetation

	
Banana Garden	DWP GARDEN
	
Animal Feed Land (Grass Area)	Palm Oil Area
	
Garden Area	

Description:
The PPI Madiun Campus participates in maintaining balance and preserving the environment by covering green areas on campus for open areas and plantations. It grows various types of plants that do not require special care. This green area is a garden around the classroom, used by staff and students for shelter and chatting. The PPI Madiun Dharma Wanita association also uses it as a garden. The area is 20.979 m².
Total Area : 183.080 m²
Percentage : 11.4%

The PPI Madiun campus has various green areas, reflecting the campus's commitment to maintain a balance between education and environmental preservation. Some prominent green areas on this campus include the banana plantation, Dharma Wanita Garden, elephant grass plantation area, oil palm area, and classroom gardens, each of which plays an important role in providing ecological, educational and social benefits for the entire academic community.

One of the interesting green areas on this campus is the banana garden. This garden is not only a place to grow bananas. The banana trees in this garden produce fruit that can be used by campus residents while creating a green and beautiful environment.

Next to the banana plantation is the Dharma Wanita Garden, a garden dedicated to the organization of Dharma Wanita Persatuan (DWP). This park is designed as a place to relax and interact, both for students and campus staff. This park enriches social life on campus and provides a place for various community activities. With a neat and aesthetic arrangement, DWP Garden offers a comfortable and calm atmosphere, making it one of the favorite places to unwind after academic activities.

Apart from that, there is a grass plantation area as a source of animal feed. The grass (Pennisetum purpureum) is a type of grass with high nutritional content, especially for ruminant animal feed. This garden reflects the campus's attention to sustainability and land use. The campus can support environmentally friendly and sustainable agricultural programs with the elephant grass garden. Apart from that, this area also functions as a living laboratory for studying grass cultivation techniques and green land management.

The PPI Madiun campus also has an oil palm area, which adds to the diversity of vegetation in the campus environment. Oil palm (Elaeis guineensis) is a plant that produces palm oil with high economic value. Even though oil palms are often associated with deforestation issues, the management of the oil palm area on campus is carried out responsibly and sustainably. Apart from being a source of learning about palm oil cultivation, this area also contributes to campus greening and provides added value in managing natural resources.

Lastly, a garden around the classrooms is an innovation in creating an outdoor learning space. This classroom garden is designed so students can study in a more natural and open atmosphere. Studying outdoors in a green environment provides a different feel, where students can feel more relaxed and inspired by nature. This classroom garden not only provides mental and physical health benefits but also supports a creative and interactive teaching and learning process.

Overall, the various green areas at the PPI Madiun reflect a holistic approach to creating a balanced campus environment between infrastructure development and nature conservation. This green area not only beautifies the campus but also makes a major contribution to maintaining environmental sustainability and supporting educational programs that are integrated with nature.

Some pictures of planted vegetation are available on the additional evidence link :
https://drive.google.com/drive/folders/1t36kjuLRWZoV-daVl1vbJyjcSd0dKo4o?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.11] Total area on campus for water absorption besides the forest and planted vegetation

Areas for water absorption

Description:
The PPI Madiun has water absorption capacity apart from the forests and plants planted. It is located spread across several points within the PPI Madiun area. The total water absorption area is 10,174 m² with a total area of 183,080 m² (percentage of area: 5.55%)

Total Area : 183.080 m²
Total Water Absorption Area : 19.332 m²
Percentage Area : 10,55 %

PPI Madiun has an area specifically designed for water absorption capacity of **5.5% of the total land area**. This percentage shows that part of the total campus area has been allocated for ecohydrological functions: managing surface water, reducing rainwater runoff, and increasing water absorption into the soil. This area is an important element in the campus's efforts to balance physical development and environmental preservation, as well as contribute to the sustainable management of natural resources in the campus environment.

Water absorption capacity is an important aspect of environmental planning, especially in urban or semi-urban areas such as campuses. Amid rapid infrastructure growth, areas with adequate water absorption capacity are needed to overcome various environmental problems, such as flooding, soil erosion, and decreasing groundwater quality. PPI Madiun Campus, with proportions of **5,5%** of the area dedicated to this function, shows its commitment to good environmental management through planning green areas and open spaces that support water absorption.

The water absorption area on the PPI Madiun campus plays a very important role both from an ecological, environmental and social perspective. One of its main functions is to manage rainwater so that it does not flow directly into drainage channels or cause flooding. In environments dominated by buildings and complex infrastructure such as roads, sidewalks and buildings, rainwater tends to drain more quickly because these surfaces are impermeable. Without an adequate absorption area, rainwater cannot seep into the ground and will instead accumulate on the surface, causing puddles or flooding.

With this area designated for a water absorption capacity of 5.5%, PPI Madiun has implemented a sustainable approach to water management. This area is able to absorb rainwater and reduce the burden on the drainage system while also helping maintain groundwater levels around the campus. Water absorption into the soil is also important to prevent erosion, especially in areas that may have slopes or are susceptible to soil erosion by surface water flows.

The benefits of this area, which functions to absorb water, are very diverse, especially in maintaining the balance of the campus ecosystem. One of the main benefits is **local flood prevention**. By having an area that can absorb rainwater, surface water flow can be reduced significantly. This prevents waterlogging in the campus area, especially during the rainy season, which often disrupts daily activities.

Apart from that, this area also contributes to **improving groundwater quality**. By absorbing rainwater into the soil, water absorption areas help replenish groundwater reserves, which is very important for the survival of the ecosystem and the need for clean water. A campus with a good water absorption system can reduce dependence on external water sources while preserving water resources for future generations.

From an ecological perspective, the area's water absorption capacity also supports campus biodiversity. The vegetation used in this area, whether grass, bushes or trees, provides habitat for various local fauna. Apart from that, these plants also function as natural filters, which can help reduce water pollution. Rainwater absorbed through vegetation undergoes a natural filtration process that filters out pollutant particles before the water reaches deeper soil layers.

Some pictures of the water absorption area are available on the additional evidence link:
https://drive.google.com/drive/folders/13aHSTuZaPdjiWCkX9yODfrbct-diWjmQ?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.17] University budget for sustainability effort (in US Dollars)

	2021	2022	2023	Average
Budget Total	$ 7.521.385	$ 8.122.004	$ 4.125.196	$ 6.589.528
Sustainability Budget	$ 6.733.438	$ 7.674.513	$ 3.475.709	$ 5.961.220
			Percentage	90 %

PPI Madiun Video Profile: https://www.youtube.com/@ppiacid)

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.19] Percentage of operation and maintenance activities of building in one year period




Operation and maintenance activities of the building

Description:

The PPI Madiun area is used for office administration activities and all services supporting the education and research implementation for the entire academic community. Apart from that, participants from all regions of Indonesia use various forms of training continuously. In conclusion, all buildings within the PPI Madiun are used (utilized) optimally and sustainably, and are always well maintained.

Total Area Main Campus : 183.080 m^2

Total area building : 68.279 m^2

Total operated building : 68.279 m²

Percentage : 37.29%

Some pictures of operation and maintenance activities are available on the additional evidence link:
https://drive.google.com/drive/folders/1oUGoLN1yC0xShaOd1QzvkLkxFjzr8Re-?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.20] Campus facilities for disabled, special needs, and/or maternity care

<table>
<tr><td> 
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<tr><td colspan="2">Facilities for disabled, special needs, and/or maternity</td></tr>
<tr><td colspan="2"> 
</td></tr>
<tr><td colspan="2">Lactation Room</td></tr>
</table>

Description:

The PPI Madiun Campus provides inclusive facilities for people with disabilities and special needs and those who need maternity care. This facility is designed to create a friendly, safe, and equal environment for the entire academic community, without exception. PPI Madiun's commitment to providing these facilities increases comfort and supports equal access to education and health services in the campus environment.

For people who have disabilities, the PPI Madiun campus has provided various facilities specifically designed to facilitate mobility and accessibility. One of the main facilities is wheelchairs, which are available on campus. Furthermore, there is a path equipped with ramps and lifts that allow people with disabilities to move around more easily. In addition, the campus also provides disability-friendly toilets designed to ensure good comfort and accessibility for wheelchair users. Road signs and important information at several points on campus are also equipped with braille and visuals that are easy to read for those with visual impairments.

Apart from supporting people with special needs, PPI Madiun also pays attention to the needs of staff who need maternity care. This campus provides a comfortable nursing room and maintains privacy for breastfeeding mothers or those who have just given birth. This facility is very important for women so that they can continue carrying out their daily activities on campus comfortably while meeting their babies' needs. Apart from the breastfeeding room, the campus also has a health room that can provide basic care for pregnant women or those who need postnatal care. These facilities are designed to ensure mothers' and babies' health and well-being while on campus. This support helps them balance their roles as mothers or staff and creates a more supportive environment for women.

Overall, the PPI Madiun is committed to equality and inclusiveness by providing disability-friendly, special needs, and maternity care facilities. These facilities help create a campus environment that not only prioritizes the quality of education but also the welfare of all its members. The campus strives to provide equal opportunities for all individuals to contribute and develop, regardless of their physical condition, medical condition, or personal situation. In this way, PPI Madiun is an excellent example of creating an inclusive and broad-minded academic community.

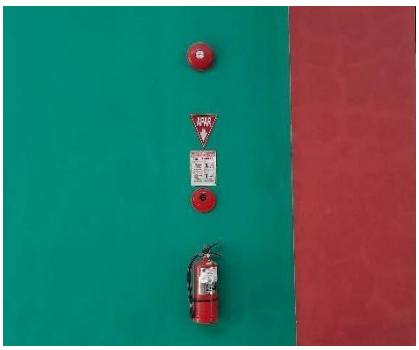
Some pictures of facilities supporting disabilities and lactation are available on the additional evidence link:
https://drive.google.com/drive/folders/1pxA_WP41_dEJF6bN8I9qmOpc3A-Iddpz?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.21] Security and safety facilities

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Security facilities</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">safety facilities</td></tr>
</table>

Description:

The PPI Madiun campus has various security facilities designed to ensure the safety of the entire academic community, including students, lecturers, and staff. Security facilities on campus include security posts, CCTV systems, and fire extinguishing devices, such as fire extinguishers and hydrants. The existence of this facility reflects the campus' commitment to maintaining a safe, conducive, and protected environment from various threats.

One of the important elements of the security system at PPI Madiun is the security posts, which are spread at various strategic points throughout the campus area. These posts are operated by security officers on duty 24 hours a day to ensure campus security runs smoothly. Security officers at these posts routinely patrol the campus area, both during campus operating hours and outside these hours, to ensure that no suspicious activity occurs. They are also ready to respond to any emergencies, such as security incidents or the need for assistance from campus residents. This security post provides a sense of security and comfort for all campus residents at once and prevents potential criminal acts or other security disturbances. The strategic location of security posts makes it easy to respond quickly to any security problems in the campus area.

Apart from security posts, PPI Madiun is also equipped with a CCTV system spread throughout the campus area, both in lecture buildings, parking areas, hallways, and open environments. These surveillance cameras are installed to monitor activities in the campus environment at all times. This Closed Circuit Television (CCTV) system not only functions as a surveillance tool but also as an effort to prevent crime. With CCTV, every event or incident on campus can be recorded and tracked easily, making it easier for security officers to carry out investigations if necessary. CCTV cameras also play an important role in providing strong visual evidence in emergencies or other security problems. The PPI Madiun campus environment becomes safer and protected from potential threats with consistent supervision.

Apart from maintaining security in terms of crime, PPI Madiun also pays great attention to safety in preventing and handling fires. To deal with potential fires, this campus is equipped with fire extinguishers or light fire extinguishers available at various strategic points, such as corridors, classrooms, laboratories, and other important buildings. This fire extinguisher is easily accessible and ready to be used by all campus residents if a small-scale fire occurs. The campus also has a hydrant, which is part of a large-scale fire prevention system. This hydrant is connected to an adequate water source and can be used by firefighters or campus security in emergencies that require quick treatment.

Some pictures of securities facilities are available on the additional evidence link:
https://drive.google.com/drive/folders/1Ax6MZfYez8oOEAM-TuHfUu72bjdMXoIt?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.22] Health infrastructure facilities for students, academics and administrative officers' well-being

Health infrastructure facilities for students, academics and administrative officers

Description:

The PPI Madiun campus has a health facility called the PPI Medika Polyclinic, which provides health services for the entire campus academic community, including students, lecturers, and staff. The presence of this polyclinic is a manifestation of the campus' attention to the health and welfare of all its residents. This polyclinic operates as a place to provide basic medical services as well as several other health services so that students and staff who need health care do not have to travel far to get medical assistance.

The PPI Medika Polyclinic is equipped with adequate medical facilities and equipment and is designed to handle general health problems often faced by students and campus staff. This polyclinic has a team of professional medical personnel, including general practitioners and nurses, ready to provide consultations and health care. Students who experience minor health problems, such as fever, flu, or headaches, can use this facility to get the necessary treatment. The polyclinic also provides regular health check-up services to help detect and prevent disease early, which is very important in maintaining overall health.

One of the superior services offered by the PPI Medika Polyclinic is the general health examination service. Every new student is required to undergo a health examination at the start of their study period to ensure that they are in good physical condition to begin academic activities. This examination includes basic tests such as blood pressure, body mass index (BMI), and other relevant health conditions. With this examination, the campus can help detect health problems early so that treatment can be carried out more quickly and effectively.

Apart from general health checks, polyclinics also provide emergency health services. Suppose an accident or medical emergency occurs on campus. In that case, the PPI Medika polyclinic is ready to provide initial treatment before the patient is referred to a hospital or more complete health facility. This is very important, considering that minor accidents or sudden health problems can happen anytime, especially in an active campus environment with various activities. The availability of medical personnel and emergency equipment at the polyclinic makes the PPI Madiun campus safer for all its residents.

PPI Medika Polyclinic also provides health consultation services for students who wish to consult about their health conditions, both related to physical and mental health. In recent years, mental health issues have received increasing attention in the higher education environment, and this polyclinic also supports efforts to improve students' mental well-being. This consultation aims to help students deal with stress, anxiety, or other mental health problems they may face during their academic life. With this service, the polyclinic not only functions as a place for physical treatment but also as a place to get psychological support.

Some pictures of the polyclinic are available on the additional evidence link:
https://drive.google.com/drive/folders/1c6r0j4l4n64G4GdmHXrgO8p6in1jk51-?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.23] Conservation: plant (flora), animal (fauna), or wildlife, natural resources for food and agriculture secured in either medium or long-term conservation facilities

<table>
<tr><td colspan="2">    </td></tr>
<tr><td colspan="2">Natural resources for food and agriculture</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Papaya garden</td><td>DWP vegetable garden</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">DWP Nursery</td></tr>
</table>

Description:
Description

Total area Campus	: 183.080 m²
Total area conservation	: 12.993 m²
Percentage	: 7,10 %

The PPI Madiun Campus is not only known as an educational institution that focuses on railway transportation but also plays a role in environmental preservation and development of natural resources by conserving plants and animals on campus. These conservation areas include various agricultural and livestock activities designed not only for ecological purposes but also to support sustainable food and agriculture. Conservation facilities on the PPI Madiun campus include a goat farm, papaya and vegetable gardens, and a plant nursery. With the existence of this area, the campus contributes to education and real practice related to agriculture and animal husbandry, which can be a source of knowledge and food support for the campus community and its surroundings.

One important part of this conservation area is the goat farm. The goat farm on the PPI Madiun campus functions as an effort to support local livestock production. By integrating animal farming and agriculture, the campus seeks to create an integrated agricultural ecosystem that is sustainable and efficient. Apart from goat farming, PPI Madiun also has a productive papaya plantation. This papaya garden not only aims to meet the campus's food needs but also functions as a learning tool by learning how to plant, care for, and harvest papaya using environmentally friendly agricultural methods.

Another part of this conservation is land for growing vegetables. This land produces various vegetables such as spinach, kale, chilies, and eggplant. In addition, the organic farming methods applied in growing these vegetables help reduce the use of chemicals and pesticides, thereby playing a role in preserving the environment.

Apart from the productive plant area, the PPI Madiun campus also has a plant nursery. This place functions as a center for producing plant seeds that will be planted in the campus agricultural area or sold to the surrounding community. This nursery does not only focus on food plants, but also on ornamental plants and perennials that can be used for reforestation. With the existence of a nursery, the campus contributes to reforestation and greening programs that support environmental sustainability. The resulting plant seeds are also used to enrich the vegetation on campus, creating a healthy and refreshing green atmosphere for the entire academic community.

Overall, the plant and animal conservation areas on the PPI Madiun campus play an important role in creating a sustainable ecosystem that supports food and agriculture. Combining a goat farm, papaya garden, vegetable plot, and plant nursery creates an environment that functions as a learning and research area and as part of the campus's efforts to support food security and environmental conservation. With this facility, the PPI Madiun campus makes a real contribution to building a more efficient, healthy, and sustainable agricultural and livestock system.

Some pictures of natural resources are available on the additional evidence link:
https://drive.google.com/drive/folders/1sLENSUnN_OQfXa_LqnYJDbLpA4bd9ZJG?usp=drive_link

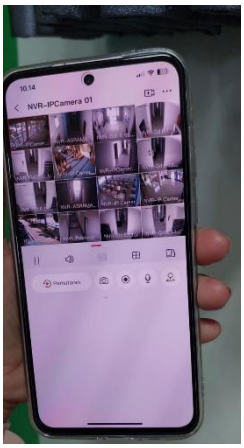
UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[1] Setting and Infrastructure (SI)

[1.24] Planning, implementation, monitoring and/or evaluation of all programs related to Setting and Infrastructure through the utilization of Information and Communication Technology (ICT)

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Using a mobile application to carry out monitoring	CCTV, Mobile Application	CCTV units and applications installed on mobile devices	On going	IT Unit Team
Implementation **(planning stage)**	Procurement and Installation, as well as equipment settings	CCTV, Mobile Application	CCTV units and applications installed on mobile devices	On going	IT Unit Team
Monitoring **(planning stage)**	Perform audits of the system periodically	Equipment and Operator Data	Equipment condition reports	On going	IT Unit Team
Evaluation **(planning stage)**	Evaluate CCTV use	Equipment and Operator Data	Equipment condition reports	On going	IT Unit Team

1. Planning

a. Needs Assessment:

- Identify specific infrastructure and regulatory requirements.
- Collect input from management and the technical team.

b. Goal Setting:

- Determine the purpose of integrating Information and Communication Technology in infrastructure.
- Align goals with organizational goals.

c. Resource Allocation:

- Allocate necessary resources i.e. budget, personnel, technology.
- Determine the required hardware and software.

2. Implementation

a. Management:

- Assign roles and responsibilities among team members.

b. Application of Technology:

- Installing and managing equipment and infrastructure.
- Ensure compatibility with existing systems.

3. Monitoring

- Ensure system performance is running well.
- Hold meetings to discuss system performance.
- Provide technical support if problems occur.
- Ensures timely equipment updates and maintenance.

4. Evaluation

- Evaluate the collected data.
- Identify if anything needs to be improved.
- Prepare reports containing programs and problems that occur.
- Consider providing training for operation and maintenance for new users

Some pictures of the utilization of ICT are available on the additional evidence link:
https://drive.google.com/drive/folders/1cFt4TA3Btcae-TePVkwWoq162ecImO44?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.1] Energy Efficient Appliances Usage

LED Lights Usage (PPI Madiun, Indonesia)

smart inverter AC Usage (PPI Madiun, Indonesia)

Energy Star equipment on printers and computers Usage (PPI Madiun, Indonesia)

Description:
Energy saving is one of the main priorities within the PPI Madiun Campus to support sustainability and operational efficiency. One of the concrete steps taken is implementing energy-saving technology, such as using LED lights, smart inverter ACs, and equipment with Energy Star certification.

LED lights were chosen because their power consumption is much lower than conventional incandescent or fluorescent lights. Additionally, the longer lifespan of LED lamps helps reduce maintenance and replacement costs—implementation of LED lights in all campus areas, including classrooms, laboratories, and public facilities.

Smart inverter AC is another innovation that has been implemented to optimize energy use. This technology is able to adjust cooling power based on room temperature automatically, thereby saving electrical energy significantly without sacrificing comfort—smart inverter AC implemented in classrooms and offices. The campus also uses equipment with Energy Star certification, which ensures efficient use of energy in electronic devices such as computers, printers, and other laboratory equipment.

The combination of LED lights, smart inverter AC, and Energy Star equipment is part of the campus' commitment to implement a sustainable energy management system. These steps support efforts to save operational costs and positively contribute to global efforts to reduce carbon emissions and preserve the environment.

Electricity usage efficiency data:

Appliance	Total Number	Total number energy Efficient appliances	Percentage
LED Lamp	1567	799	**50,98%**
AC smart inverter	392	326	**83,16%**
Energy star equipment	467	118	**25,26%**
		Average Percentage	**53,133%**

The Pictures about Energy Efficient Appliances Usage evidence link :
https://drive.google.com/drive/folders/1f-IU3Zt5EKM9B8ig7SXX5Y3F5oPLz9MB?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.3] Smart Building Implementation
***Min. at least five requirements for each building**

No.	Name	Place	automation		safety				Energy		water		Indoor environment				lighting				Building Area (m^2)
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4	
1	Rectorate Building	Madiun, Indonesia		X	X	X	X		X							X	X	X	X	X	1,435
2	Merah Putih Building	Madiun, Indonesia		X	X	X	X		X							X	X		X	X	1,330
3	Auditorium	Madiun, Indonesia		X	X	X	X									X	X		X	X	4,505
4	Dormitory	Madiun, Indonesia		X	X	X	X		X							X	X		X	X	3,500
5	Guest House	Madiun, Indonesia		X	X	X	X									X	X		X	X	1,590
6	Sport Centre	Madiun, Indonesia		X	X	X	X									X	X		X	X	1,070
7	Station	Madiun, Indonesia		X	X	X	X									X	X		X	X	650
8	Smart Building	Madiun, Indonesia		X	X	X	X									X	X		X	X	1,336
9	Electrical Warehouse	Madiun, Indonesia		X	X	X	X									X	X		X	X	3,260
10	Mechanical Warehouse	Madiun, Indonesia		X	X	X	X									X	X		X	X	2,830
11	Multimedia Building	Madiun, Indonesia		X	X	X	X									X	X		X	X	1,175
12	Mosque			X	X	X	X									X	X		X	X	1,750

	Total		12	12	12	12										12	1	12	12	24,431

Please compile one row for each building (or homogeneous part of it) by ticking with an "X" for each requirement

Smart building implementation

$$\frac{6{,}265\ m^2}{24{,}431\ m^2} \times 100\% = 25{,}64\ \%$$

PPI Madiun has implemented buildings that have 25.64% smart buildings

The Building Management System (BMS) implemented in the rectorate, the Merah Putih, and the dormitory building has an important role in increasing operational efficiency, comfort, and security. In the rectorate building, the building management system (BMS) is designed to automate various aspects of surveillance and security. One of its main features is automated video surveillance, which uses cameras to monitor activity in the area around the building in real time, thereby helping to maintain security and prevent criminal activity. In addition, the BMS is equipped with an intruder alarm system that detects and warns if there is an intruder or unauthorized access, increasing the overall level of building security. In terms of fire protection, an integrated fire-fighting system includes smoke detectors and extinguishing devices to identify potential fires early so that preventive measures can be taken before the situation worsens. In addition to monitoring and security, BMS also focuses on energy efficiency through energy monitoring, which monitors a building's energy consumption to identify usage patterns and potential savings. The environment in the building is regulated using a passive system, which utilizes natural design to maintain comfortable temperatures and air quality without relying entirely on mechanical systems. For lighting, this system uses energy-saving LED lights and lights with motion sensors that only turn on when it detects presence, thereby helping to reduce energy consumption and operational costs. Overall, the implementation of BMS in the rectorate building creates an environment that is safe, comfortable, and efficient for energy use.

The building management system (BMS) has been designed to increase efficiency and safety by automating various important functions at the red and white building. One of the main features of this BMS is automatic video surveillance, which allows visual monitoring of building areas in real time via CCTV cameras. It serves to maintain building security by giving owners and security personnel the ability to immediately detect suspicious activity. Additionally, the BMS has an intruder alarm system to detect intrusion attempts, providing fast and efficient alerts to prevent potential threats. To protect buildings from fire, integrated fire-fighting systems include various devices such as smoke detectors and automatic sprinklers that detect and extinguish fire immediately, thereby reducing the risk of damage. BMS also provides energy monitoring to monitor energy consumption efficiently, allowing building managers to monitor energy usage and identify areas that can be saved. The environment in the building is also considered by implementing a passive system, which utilizes architectural design to maintain a comfortable temperature and air quality without relying entirely on mechanical systems. Lastly, in terms of lighting, BMS uses LED lights, which are known to be energy efficient. With all these features, BMS in the red and white building creates a safe, comfortable, and sustainable environment.

In dormitories, building management systems (BMS) are designed to improve occupant safety and comfort through various advanced automation features. One of the key elements of this BMS is automatic video surveillance, which uses CCTV cameras to monitor the area around the building in real time, making it easier for managers and security officers to detect suspicious activity and maintain the safety of residents. In addition, the system is equipped with an intruder alarm system that detects intruders or unauthorized access, providing immediate warnings to prevent potential threats. In terms of fire protection, an integrated fire-fighting system includes smoke detectors and extinguishing devices that can work automatically, ensuring a quick response to emergencies and reducing the risk of greater damage. BMS also provides energy monitoring, which allows managers to monitor energy consumption efficiently and identify areas that can be optimized for savings. The environment in the building is regulated through the implementation of a passive system, which utilizes

architectural design to maintain comfortable temperature and air circulation, thereby reducing dependence on mechanical cooling systems. Lastly, using LED lamps in lighting systems provides efficient and bright lighting and helps reduce energy consumption and operational costs. With all these features, BMS in dormitory buildings creates a safe, comfortable, and environmentally friendly environment for residents.

Electrical Warehouse Building	Mechanical Warehouse Building
	
Smart Building	Multimedia Building
	
Mosque	Rectorate Building

	
Station	Merah Putih Building
	
Dormitory Building	Auditorium Building
	
Executive Dormitory Building	Sport Centre

The pictures about Smart Building Implementation are available on the evidence link :
https://drive.google.com/drive/folders/1fCNEWA3W3mtZ28IMC-bQ1veMzox3mqRC?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.5] Renewable Energy Sources on Campus

The use of solar panels on streetlighting

The use of Windmills on the red-and-white building

The use of biodiesel in generators with a capacity of 1275 KVA and 600 KVA, which are used as PPI Madiun's electrical power supply

Description:

The use of solar panels, windmills, and biodiesel on the PPI Madiun campus is an innovative step in integrating renewable energy technology to support sustainability and energy efficiency. Solar panels harness the sun's energy to produce electricity, which can be used for street lighting. Windmills installed in open areas utilize wind energy to produce additional electricity, especially at night or when

the weather is cloudy. Windmills at the PPI Madiun campus location are used as a source of electrical energy in the station building. Meanwhile, biodiesel is used as generator fuel and electricity backup for PPI Madiun. The implementation of these three technologies not only increases campus energy efficiency but also becomes a living laboratory for students and employees to study and develop renewable energy technologies. This initiative is in line with the campus' efforts to be a pioneer in the use of clean and environmentally friendly energy, as well as supporting the creation of a more sustainable educational environment.

1. Solar panels are used as street lighting in the campus environment, and the off-grid method involves lighting lamps without being connected to the main electricity network. In this context, solar panels produce electrical energy, stored in batteries and then used to power lights. The following is a further explanation regarding the use of solar panels with the specifications mentioned:

A. Method Off-grid

- Definition: The off-grid method means this system is stand-alone and disconnected from the public electricity network (PLN). This allows the lighting to continue functioning despite a power outage.
- Main Components: Solar panels, storage battery, charge controller, and LED lighting.

B. 100 Wp Solar Panel Specifications

- Wp (Watt peak): The maximum power capacity the solar panel can produce under optimal conditions. A 100 Wp panel can produce 100 watts of power in full sunlight (ideal).
- Number of Units: With 19 solar panel units of 100 Wp each, the total capacity produced is 1900 Wp. This means the system is capable of producing a total of around 1900 watts of power at peak production.

C. Lighting System Components

- Solar Panels: Converts solar energy into electrical energy. The panels are installed in a location exposed to maximum sunlight.
- Battery: Stores electrical energy produced by solar panels for use at night or in cloudy weather. The battery must have sufficient capacity to supply energy during street lighting hours.
- LED lights: They are usually chosen because of their high energy efficiency and long service life. Low power consumption is also important so the stored energy is enough to light throughout the night.
- Charging Controller: Regulates the energy flow from the solar panel to the battery and from the battery to the lights. This prevents the battery from overcharging or deep discharge.

D. System Design Considerations

- Battery Capacity: Calculated based on how long the light will be on (for example, 12 hours per night) and the power consumption of the light.
- Installation Position: The solar panel is installed at a certain angle to receive optimal sunlight throughout the day. Avoid shadows from trees or buildings.

- Safety and Maintenance: Regular monitoring and maintenance are required to ensure optimal panel, battery, and light performance. Protection from theft or damage should also be considered.

E. Advantages of Off-grid Systems

- Energy Saving: Reduce electrical energy from the main grid and utilize renewable energy.
- Not Dependent on Electricity Network: Lighting continues to function despite a power outage in the surrounding area.
- Environmentally Friendly: Reduces carbon emissions by utilizing solar energy.

F. Challenges and Solutions

- Bad Weather: Solar panel performance will decrease when the weather is cloudy or rainy. Using a large-capacity battery or backup system could be a solution.
- Initial Cost: The initial investment for panels, batteries, and other components is relatively high. However, operational and maintenance costs are lower than those of conventional electricity in the long term.

2. The use of biodiesel as generator fuel for backup electricity on the PPI Madiun campus is a strategic step in supporting energy sustainability and reducing carbon emissions. There are two Generator Sets at PPI Madiun with a power capacity of 1275 KVA and 600 KVA. By utilizing biodiesel, which can be produced from waste cooking oil or other vegetable sources, the campus can provide an environmentally friendly backup electricity supply when a power outage or additional power is needed. Biodiesel-fueled generators reduce dependence on fossil fuels and provide a cleaner and more efficient solution for generating electricity, considering that biodiesel has lower greenhouse gas emissions than conventional diesel. This step also aligns with the campus's vision to be an example of implementing renewable energy technology and increasing student and academic community awareness of the importance of using alternative energy to support sustainable operations.

3. The use of a 1000-watt windmill as an energy source at the PPI Madiun station is an innovative effort to utilize wind energy to meet electricity needs in the area. This windmill converts wind kinetic energy into electrical energy through a rotor and generator attached to the turbine. With a maximum power of 1000 watts, the energy produced can support light electricity needs such as lighting, charging electronic devices, and supporting station monitoring and communication systems. The implementation of this windmill has several advantages, including the use of renewable energy, which does not produce greenhouse gas emissions, and the reduction of dependence on electricity supply from the main grid. A strategic location of the station, especially if it is in an area with sufficient wind speed, will increase the efficiency and productivity of the windmill. This system can also be combined with energy storage, such as batteries so that the energy produced can be stored and used when electricity demand increases or when the wind is not blowing. By using this windmill, PPI Madiun not only gets a more stable and independent energy supply but also provides a real example of the application of environmentally friendly technology. This can educate students and the surrounding community regarding the importance of utilizing alternative energy sources for environmental sustainability and energy efficiency.

The pictures and videos about Renewable Energy Sources on Campus are available on evidence link :
https://drive.google.com/drive/folders/1t59phR--XC1OPOeUh2gT1ssOq5WvQuAU?usp=sharing

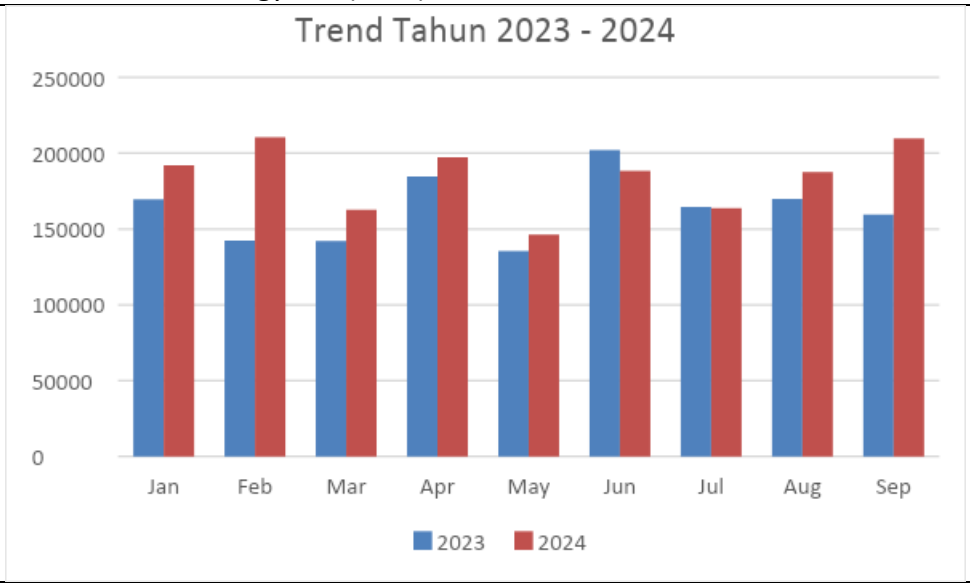
UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.6] Electricity Usage per Year (in Kilowatt hour)

Total energy use (KWh) at PPI Madiun from 2017 - 2024



Trends in energy use (kWh) in 2023 - 2024

Description:

In 2018, PPI Madiun experienced an increased learning capacity by opening one additional class in each existing study program. This addition was made to accommodate the increasing number of students and improve the quality of the teaching and learning process. However, this increase in class numbers directly impacted campus energy consumption, especially electricity. Greater energy needs can be seen from the increase in annual electricity consumption, which jumped from 1,587,740 kWh in 2017 to 1,766,120 kWh in 2018. This increase was caused by supporting facilities such as additional classrooms, laboratories, and electronic devices such as computers and projectors operating more frequently than in previous years.

From 2019 to 2021, campuses face global challenges due to the COVID-19 pandemic, which forces learning to be online. Restrictions on physical activity on campus have led to a drastic reduction in electricity use. The work-from-home and online learning policies implemented to reduce the risk of virus transmission have resulted in unused campus facilities or only being used on a limited basis. This is reflected in the significant decrease in

energy consumption from 1,766,120 kWh in 2018 to 1,436,160 kWh in 2019. This decrease will persist until 2021, showing the direct impact of reducing physical activity on campus.

In 2022, after the pandemic subsides and campus activities return to normal, energy consumption will increase drastically to 2,132,680 kWh. This happened because all students and staff returned to their activities on campus, and all facilities, such as classrooms, laboratories, and administrative offices, returned to operation. This surge in electricity consumption was also triggered by the use of large amounts of electronic devices and the need for air conditioning (AC) to create a comfortable learning environment amidst the increasing number of campus residents.

PPI Madiun implemented various energy efficiency policies to overcome this increase in energy consumption. One of them is limiting the use of AC. The AC is only turned on at certain hours, such as during lecture hours or when the room is used intensively. The air conditioning temperature is also set at 25 degrees Celsius, which is considered the ideal temperature for comfort without overloading energy consumption. This policy is expected to significantly reduce energy use without sacrificing the comfort of campus learning and working environment. This energy efficiency initiative also reflects the campus's commitment to balancing operational needs and environmental sustainability.

Electricity usage data per year from PLN is available on the evidence link :
https://drive.google.com/drive/folders/1dKxhZlmbZV5Y6TmgVrr-AwecbxM2xoLo?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.8] ratio of renewable energy production divided by total energy usage per year

The use of solar panels on street lighting

The use of biodiesel in the generator used as PPI Madiun's electrical power supply

The use of Windmills on the Merah Putih building

Description:
(*Please describe the renewable energy sources on your campus. The following is an example of the description. You can describe more related items if needed*.)

No	Renewable Energy	Production (in kWh)
1	Biodiesel	30.000
2	Solar panel	3.467,5
3	Windmill	1.825
	Total	35.292,5

32,292.5 / total consumption (Electricity usage) = 32,292.5/2,008,880 = 0.02%

The Pictures about renewable energy production are available on the evidence link :
https://drive.google.com/drive/folders/1rsQYFVb3yhaI_NlIM8pwKvBcwvienFJg?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.9] Elements of Green Building Implementation as Reflected in All Construction and Renovation Policies

The Electrical and Mechanical Depot has a natural air circulation system

Mosque building

Description:
The Electric Dipo, Mechanical Dipo Buildings, and Mosque, which apply the green building concept, are designed to maximize energy efficiency and create a comfortable environment for their users. All three buildings utilize natural ventilation, which allows fresh air to flow in and out naturally, reducing reliance on mechanical air conditioning systems. The open and smart architectural design also supports good air circulation, keeping the room temperature cool.

In terms of lighting, this building adopts full natural lighting, which makes maximum use of sunlight through large windows, skylights, and transparent materials. This reduces the need for artificial lighting and creates a warmer and more pleasant atmosphere in the room.

The existence of a green environment around buildings is very important, as parks and green open spaces are planted nearby, providing additional benefits such as carbon absorption, improved air quality, and recreational space for residents. Integrating these elements supports sustainability and enhances the quality of life, creating a place of harmony between humans and nature. With this concept, the Electric Depot, Mechanical Depot, and Mosque are examples of modern buildings that care about the environment and are sustainable.

The pictures of Green Building Construction are available on the evidence link :
https://drive.google.com/drive/folders/1rlhFgnw1fVrcgPznbxLjpmvkGmzURiE5?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.10] Greenhouse gas emission reduction program

1. Electric Car

2. Bicycles for mobilizing the academic community

3. Solar Panels

4. Tree planting program

5. DWP Garden

Description:

The PPI Madiun Campus's greenhouse gas emission reduction program focuses on using electric cars for mobilization needs in the campus environment. The campus is trying to reduce carbon emissions and support environmental sustainability by replacing conventional vehicles with electric cars. This program includes providing charging stations and training in the use of electric vehicles. Through this initiative, PPI

Madiun creates a cleaner environment and becomes an example for other institutions in their efforts to achieve sustainability goals. The PPI Madiun Campus's greenhouse gas emission reduction program aims to promote the use of bicycles as the main mode of transportation in the campus environment. The campus seeks to reduce dependence on motorized vehicles and carbon emissions by encouraging students and staff to cycle. This program includes providing safe bicycle lanes, bicycle parking facilities, and awareness campaigns regarding the benefits of cycling for health and the environment. Through this initiative, PPI Madiun contributes to reducing emissions and creates a culture of healthy and sustainable living among the academic community.

The PPI Madiun Campus's greenhouse gas emission reduction program focuses on utilizing solar panels as a renewable energy source. By installing solar panels on various campus facilities, this program aims to reduce dependence on fossil energy sources and significantly reduce carbon emissions. In addition, the campus will educate students and staff about the benefits of renewable energy and how solar panels work. Through this initiative, PPI Madiun is committed to creating a cleaner environment, supporting sustainability, and promoting awareness about the importance of using green energy. The greenhouse gas emission reduction program with the green building concept focuses on two main initiatives: planting trees and creating green areas. Planting trees is one of the most effective strategies for mitigating climate change because trees are a significant absorber of carbon dioxide (CO_2) through photosynthesis. In this program, various tree species suitable for the local climate will be planted in strategic areas, such as parks, roads, and public spaces, contributing to reducing emissions and creating habitats for biodiversity. In addition, creating green areas, such as community parks and urban gardens, is important in creating open spaces that the community can use for recreation and environmental education. This green area was designed using local plants, which can absorb carbon and manage rainwater. Developing green areas can also involve active community participation, increasing environmental awareness, and encouraging sustainable practices. By integrating tree planting and creating green areas in emission reduction programs, we not only create a cleaner and healthier environment but also strengthen ecosystem resilience and improve people's quality of life, making this effort a long-term investment for a sustainable future.

The Pictures and a video about greenhouse gas emission reduction program are available on the evidence link :

https://drive.google.com/drive/folders/1zxjQg30xcSaf7uCr8aUijsQWjV5GOVKE?usp=sharing

https://drive.google.com/file/d/1Gia2z6rWOGaZezXD_oQKakvZe6Z2ybNr/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.11] Please Provide The Total Carbon Footprint (CO_2 emission in the last 12 months, in metric tons)

Option 2: Recommended by UI GreenMetric

CO_2 (electricity)

$$= \frac{electricity\ usage\ per\ year\ (kWh)}{1000} \times 0{,}84$$
$$= \frac{2{,}008{,}880\ kWh}{1000} \times 0{,}84$$
$$= 1{,}687.46 \text{ metric tons}$$

CO_2 (cars)

$$= \frac{number\ of\ cars\ entering\ your\ university \times 2 \times approximate\ travel\ distance\ of\ vehicle\ each\ day\ inside\ campus\ only\ (KM) \times 240}{100} \times 0{,}02$$
$$= \frac{23 \times 2 \times 1.2 \times 240}{100} \times 0{,}02$$
$$= 1.32 \text{ metric tons}$$

CO_2 (motorcycle)

$$= \frac{number\ of\ motorcycle\ entering\ your\ university \times 2 \times approximate\ travel\ distance\ of\ vehicle\ each\ day\ inside\ campus\ only\ (KM) \times 240}{100} \times 0{,}01$$
$$= \frac{95 \times 2 \times 1.2 \times 240}{100} \times 0{,}01$$
$$= 5.472 \text{ metric tons}$$

CO_2 (total)

$$= 1{,}687.46 + 1.32 + 5.472$$
$$= 1{,}694.256 \text{ metric tons}$$

Carbon footprint in 2018 = $1{,}694.256$ metric tons

Example of Total Carbon Footprint (UI GreenMetric)

Description:
The total carbon emissions produced in the PPI Madiun environment can be calculated based on energy use from various sources. Based on available data, electrical energy contributes to emissions of 1,687,459 metric tons of carbon. Emissions from vehicles are also an important factor, with cars producing 1.32 metric tons and motorbikes contributing 5,472 metric tons of carbon.

If we add up all these contributions, the total emissions from various sources at PPI Madiun are as follows:

1. Electrical Energy: 1,687,459 metric tons
2. Car: 1.32 metric tons
3. Motor: 5,472 metric tons

By adding up all these carbon emissions, we get 1,694,256 metric tons of carbon emissions.

This total reflects the impact of using electrical energy and motorized vehicles on the environment. It is important to consider emission reduction measures, such as increasing energy efficiency, promoting environmentally friendly transportation, and switching to renewable energy sources. Such efforts can help reduce total carbon emissions in the future, contributing to environmental protection and climate change mitigation.

The video about PPI Madiun Profile can be accessed at the link:
https://www.youtube.com/@ppiacid)

The data about Total Carbon Footprint is proven in evidence link:
https://drive.google.com/drive/folders/1dWKk_VZCdyZfMOldA5smbPY3FUJxzVYP

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.13] Number of innovative program(s) in energy and climate change

Lamp with motion sensor

Use of IoT in control and monitoring

AC temperature policy at 25 C

Innovative PPI Madiun program

Description:

(*Please describe innovative program(s) on your campus. The following is an example of the description. You can describe more related items if needed*.)

Campus policies for energy savings are implemented through various innovative methods that support efficiency and sustainability. The following is a description of each method applied:

1. Use of lights with motion sensors
   The campus uses lights with motion sensors in various areas, such as hallways, classrooms, and toilets, to reduce unnecessary energy consumption. This light will automatically turn on when it detects movement and turn off after a while if there is no activity. This policy significantly reduces electricity use in rarely used areas or when the campus is quiet, especially at night or on weekends.
2. AC temperature policy at 25 C
   To maintain energy efficiency and comfort, the campus has a policy to set the AC temperature at 25°C. This temperature is optimal for creating a comfortable environment without excessive energy consumption. The AC is also only operated at certain hours, such as when teaching and learning activities occur. This policy helps reduce electricity loads, especially in buildings with a large number of air-conditioned rooms.
3. The use of photo sensors on street lighting
   Street lighting on campus is equipped with photo sensor technology, allowing the lights to turn on automatically when dark conditions and turn off when conditions are bright. This technology ensures that street lights only come on when needed, significantly reducing energy consumption and ensuring safety on campus at night. The use of photosensors also reduces the need for manual control and the risk of wasting energy due to lights being on continuously.
4. Use of IoT in control and monitoring
   The campus utilizes Internet of Things (IoT) technology to monitor and control energy use in various facilities. This system allows real-time monitoring of energy consumption, device condition, and operational status, such as AC temperature or lighting in each room. With IoT, campuses can identify areas of high energy use and make timely adjustments or interventions. In addition, the use of IoT also enables automatic reporting and data analysis for more effective energy policy planning.

Implementation of these four methods shows the campus' commitment to significantly reducing energy consumption, supporting sustainability, and creating a more efficient environment. These steps positively impact reducing operational costs and make a real contribution to environmental conservation efforts.

The pictures about innovative programs in energy and climate change are available in the evidence link :
https://drive.google.com/drive/folders/1D9tEaz4OuZjAEKxEhCcLjH8hbIgajsNz?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.14] Impactful university program(s) on climate change

No	Programs	Scope (international /regional/national/local / etc)	Total Participants	Photo	URL	Short Description
1	Community service creating and installing solar power plants for the community around PPI Madiun	Surrounding Community	5 Teacher 10 Student	 	https://jurnal.ppi.ac.id/JPM/article/view/242	Madiun Spoor: Journal of Community Service

The pictures of the university program on climate change are available in the evidence link : https://drive.google.com/drive/folders/1fRV-UqPf6KtcXNUofIoXTly9bdaDQ60k?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia (PPI) Madiun
Country : Indonesia
Web Address : ppi.ac.id

[2] Energy and Climate Change (EC)

[2.15] Planning, implementation, monitoring and/or evaluation of all programs related to Energy and Climate Change through the utilization of Information and Communication Technology (ICT)

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Assess the potential for renewable energy installations	Using GIS mapping and renewable energy simulation software	The results are in the form of a feasibility study and location assessment report to determine the suitability of the location for renewable energy installations	July 2024 - August 2024	Energy Management, ICT Dept
Implementation	Installing solar panels and wind turbines	Use project management tools and installation scheduling software	This process is documented in the installation log and produces energy production data	September 2024	Facility Management, Energy Dept
Monitoring	Tracking renewable energy production	Using a renewable energy monitoring system	The resulting data is in the form of energy production reports and performance analytics to monitor the efficiency and output of renewable energy systems	Ongoing	Energy Management, ICT Dept


Renewable energy simulation software and installation of renewable energy

Description:

Energy renewal through information and communication technology (ICT) can increase renewable energy's efficiency, management, and use. This process involves three main stages: planning, implementation, and monitoring. The following is a brief explanation regarding each stage:

1. Planning (Planning)

At the planning stage, the main goal is to design a strategy to adopt renewable energy with the support of ICT technology. Some important steps in planning include:

- Energy needs analysis: Identify current energy needs and potential utilization of renewable energy sources, such as solar power, wind, or biomass.
- ICT infrastructure development: Plan the necessary technological infrastructure for energy management, including software and hardware. This includes the development of smart grids, the Internet of Things (IoT), intelligent metering systems, and cloud computing for data management.
- Technology feasibility study: Analyzing the feasibility of various ICT technologies in supporting energy renewal. This includes cost calculations, technology availability, and impact on the environment.
- Regulations and policies: Develop policies that support renewable energy and ICT technology and identify relevant government incentives and regulations.

2. Implementation (Implementation)

Implementation is the stage where planning is implemented in real terms using ICT technology to support the development of renewable energy. The main steps in this stage include:

- Building renewable energy infrastructure: Installing renewable energy sources such as solar panels or wind turbines and integrating this infrastructure with planned ICT systems.
- ICT system integration: Connecting smart electricity networks, smart meters, IoT sensors, and data management platforms. This enables automatic and more efficient energy monitoring and management.
- Energy management application development: Implementing software to manage energy distribution and consumption for energy utilities and individual consumers. This application can monitor energy usage, optimize distribution, and reduce energy waste.
- Training and capacity building: Train workers and the community regarding the use of ICT technology and renewable energy and increase awareness about the importance of efficient energy management.

3. Monitoring

After implementation, continuous monitoring is required to ensure the success of the energy renewal program and assess the effectiveness of the system that has been implemented. Some activities in the monitoring stage include:

- Data collection and analysis: ICT systems collect real-time data from sensors, smart grids, and energy management applications. This data is analyzed to identify energy use efficiency, detect disruptions, and estimate future energy needs.
- System optimization: Based on the results of data analysis, energy distribution and consumption are optimized. For example, electricity distribution can be adjusted based on demand or weather conditions that affect renewable electricity generation.
- Evaluation of success: Comparing the results achieved with the initial target and evaluating whether the implementation of ICT technology has supported the goals of energy renewal. If necessary, repairs or upgrades to the system are carried out.
- Regular reports: Prepare regular reports for the government, investors, and other stakeholders regarding the performance of energy renewal programs and their impact on the environment and economy.

PPI Madiun monitors solar panel and wind turbine power usage using a WiFi monitoring system. DIY Wifi Monitoring Power Solar Panel System via Blynk is a watt meter that allows power consumption to be monitored online. This system uses the Blynk application as an integrated platform to monitor real-time power usage from solar panels, wind turbines, or DC power systems. By using Blynk, users can view electricity usage data, battery charge status, and other related information via a WiFi connection. This system is designed to make it easy to monitor the performance and efficiency of power use from solar panels or DC power sources and ensure optimal and sustainable power use. With a structured approach through planning, implementation, and monitoring, energy renewal programs supported by ICT technology can provide long-term benefits, including increased energy efficiency and access to renewable energy, but reduced carbon emissions.

The pictures and videos about the utilization of Information and Communication Technology (ICT) are available in the evidence link :
https://drive.google.com/drive/folders/1VvE8lznoRX4mj5PB8VKY5O-un2N_I2IF?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.1] 3R (Reduce, Reuse, Recycle) program for university's waste


SAMPAH
SESUAIKAN
JENISNYA


7 Okt 2024 17.05.38
Index number: 216


POLITEKNIK PEKERETAAPIAN
BANK SAMPAH
UI GREENMETRIC

Description:

PPI Madiun implements the 3R (Reduce, Reuse, Recycle) program. The 3R program carried out includes:

1. Reducing the use of single-use items such as replacing paper cups with ceramic or melamine cups, reducing the use of plastic cutlery with stainless steel spoons or forks and encouraging all employees and students to use tumblers.
2. Using more efficient energy such as turning off the room lights during the day when not in use and using natural lighting from the sun by opening the room's glass curtains.
3. Reuse used goods by using used bottles to make flower pots.
4. Placing trash cans in every building consisting of organic, inorganic and hazardous waste, making it easier for the campus academic community and students to participate in managing or grouping waste in their daily lives.

5. PPI Madiun has also collaborated with companies and agencies, especially those related to medical waste and other hazardous waste (PT Arah environmental Indonesia). Medical waste and hazardous waste (used oil, fluorescent lamps, printer cartridges, batteries, etc.) cannot be thrown into regular trash.
6. Organic waste such as leaves and food waste is used as compost using the biopore method at a distance of approximately 2 meters per point.

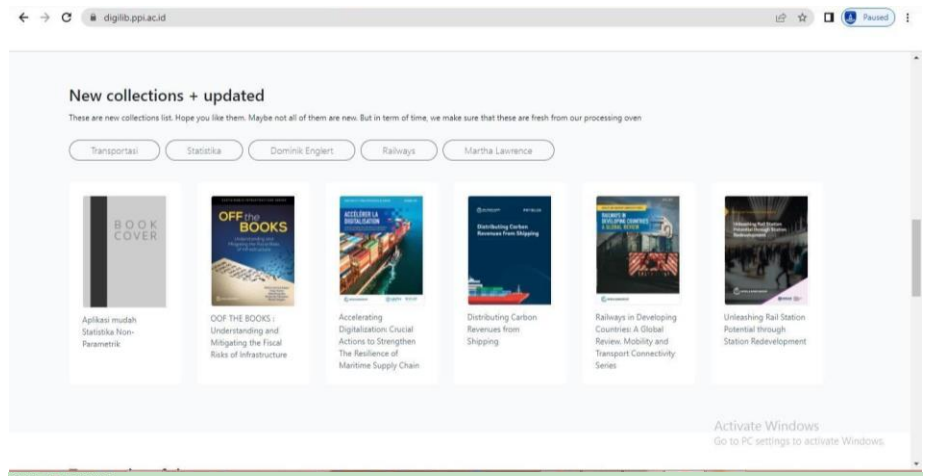
PPI Madiun Profile: https://www.youtube.com/@ppiacid
Some pictures of 3R program are available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

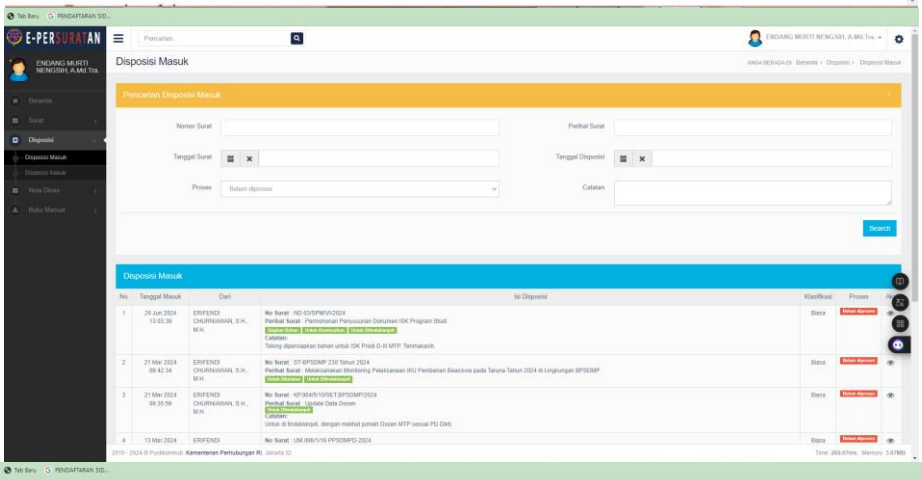
UI GreenMetric Questionnaire

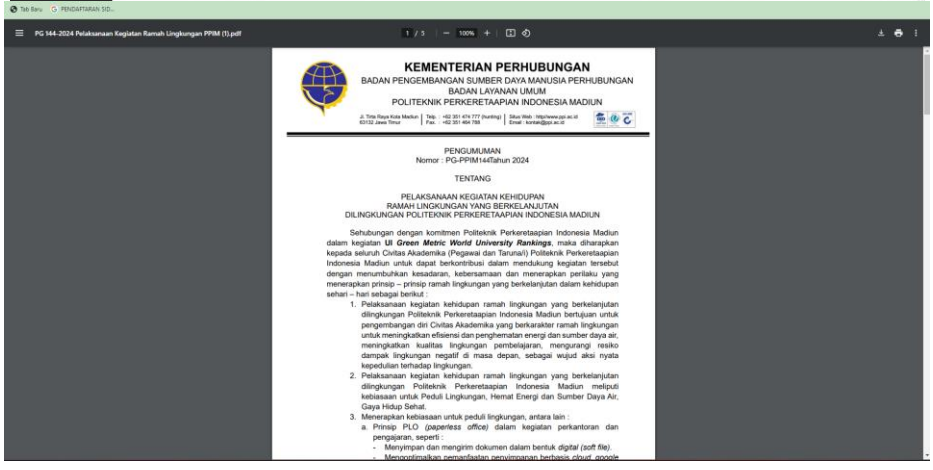
University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.2] Program to reduce the use of paper and plastic on campus








Monday, 07 October 2024 at 08.04.32
7° 38' 12" S, 111° 30' 3" E
Jawa
Kota Madiun


GUNAKAN TAS BELANJA RAMAH LINGKUNGAN UNTUK SELAMATKAN BUMI KITA
USE ENVIRONMENTALLY FRIENDLY SHOPPING BAGS TO SAVE OUR EARTH
KURANGI SAMPAH PLASTIK DAN KERTAS
REDUCE THE USE OF PLASTIC AND PAPER
BUANGLAH SAMPAHMU SESUAI PADA TEMPATNYA
DISPOSE OF YOUR TRASH IN THE PROPER PLACE
AYO LAH MULAI MENGGUNAKAN TUMBLER KALIAN SENDIRI UNTUK MENGURANGI DAMPAK SAMPAH PLASTIK
COME ON START USING YOUR OWN TUMBLER TO REDUCE THE IMPACT OF PLASTIC WASTE
POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN


JENIS-JENIS TEMPAT SAMPAH
(TYPE OF TRASH CAN)
BUANGLAH SAMPAHMU SESUAI PADA TEMPAATNYA!
UI GREENMETRIC
POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN
KURANGI SAMPAH PLASTIK & KERTAS
REDUCE THE USE OF PLASTIC AND PAPER

Description:

PPI Madiun supports reducing the use of paper and plastic in the campus environment. Reducing paper use means reducing CO2 emissions. One of the things PPI Madiun has done is:

1. Storing and sending documents in digital form (soft files)
2. Use of the E-mail application and use of email as a substitute for letters with headed paper for formal internal communications between sections/units such as invitations, requests for information/data between units, notifications, etc.
3. Use of Information Technology (IT) based learning by utilizing digital resources such as ELearning, Podcasts, Subscriptions to online information resources E-Books (https://digilib.ppi.ac.id/), Journals, Newspapers, Magazines, and others -other.
4. Optimize the use of cloud-based storage, Google Drive and others to store and share documents.
5. Print files using both sides of the paper.
6. Print when needed documents in hardfile form.
7. Always double check data before printing.

This is also in accordance with the Announcement of the Director of PPI Madiun number PG-PPIM 144 of 2024.

PPI Madiun also supports reducing plastic use by:

1. Minimize the use of single-use plastic bags.
2. Optimizing the use of shopping bags that can be used repeatedly.
3. Use food and drink containers that can be washed and reused.
4. Choose products made by environmentally friendly producers and preserve natural resources.

PPI Madiun Profile: https://www.youtube.com/@ppiacid

Some picture of reducing paper and plastic are available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : ww.ppi.ac.id

[3] Waste (WS)

[3.3] Total volume organic waste produced

Type of organic waste	Total Produced (ton/year)
- food waste	2,6
- leaf	40,14

Description:
The types of organic waste produced by PPI Madiun are food waste and leaf waste. Organic food waste comes from the Cadet dining room and Canteens The amount or volume of food waste produced comes from leftover food by cadets and employees which has been separated into organic waste bins. Leaf waste comes from trees in the green open spaces of the PPI Madiun. The amount or volume produced is based on the season that occurs at PPI Madiun. The waste that was produced was separated and is then taken to the temporary organic waste storage site for weighing and recording every day before processing.

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : ww.ppi.ac.id

[3] Waste (WS)

[3.4] Total volume organic waste treated

Type of waste	Amount (ton)			
	Total	Reduced	Reused	Recycled
Organic				
- food waste	2,6			1,5
- leaf	40,14			31,08
Total Trash	**42,74**			**32,58**

Description:
There are several types of organic waste produced by PPI Madiun, including: solid food waste and dry leaves. Apart from office and lecture units, organic waste is often produced by dining rooms, canteens, and green open spaces. PPI Madiun has committed to managing organic waste by managing organic waste from products resulting from activities starting from 1 temporary storage to final management starting from recycling, using the BSF method, processing for animal feed to making compost fertilizer and in collaboration with other parties: Winongo TPA at the Madiun City. The temporary storage process is divided into 2 places: temporary storage place for solid food waste and dry leaf waste.
The process of managing food waste organic solid waste starts from placing closed organic waste bins at all points of the building on the PPI Madiun campus, then every day the waste is collected at the temporary storage place for food waste solid organic waste and then weighed and recorded.
Next there are three management stages, the first of which is managed using the BSF (Black Soldier Fly) method, as animal feed and the rest was handed over to the Winongo TPA. The BSF method is a method of processing organic waste using larvae (maggots) of BSF. The BSF maggots have the ability to degrade organic waste faster than other insects. Meanwhile, the method of feeding livestock is by processing leftover food to be given to livestock at PPI Madiun (Goats and Fish).
Meanwhile, the dry leaf waste management process begins with cleaning up leftover leaves in green open spaces by the community service staff at the PPI Madiun, then collecting them and weighing and recording them, then the leaf waste is managed using the Biopore method. The Biopore method is a way of making water absorption holes in the ground to overcome standing water and increase the absorption capacity of rainwater. Biopori is a soil conservation method that has many benefits. The working principle of biopori is to make a hole in the ground and fill organic waste in it. Organic waste will trigger soil biota such as worms, ants and plant roots to create cavities in the soil). Leaf waste management is also carried out by utilizing empty land. First, make sure the land to be used is far from the well. Leave a distance of about ten meters. Then, dig the land approximately 1.5-2 meters wide and 1 meter deep. Put all the organic waste in the house (leaf waste) into the hole. To disguise the smell, add composted soil on top. Do this every day until the dug hole is full. Once full, then cover with soil. Press the soil until the dug hole is completely covered by soil. The organic waste will undergo composting. After three months, the compost can be used to fertilize the soil.

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

Template for Evidence(s)
UI GreenMetric Questionnaire

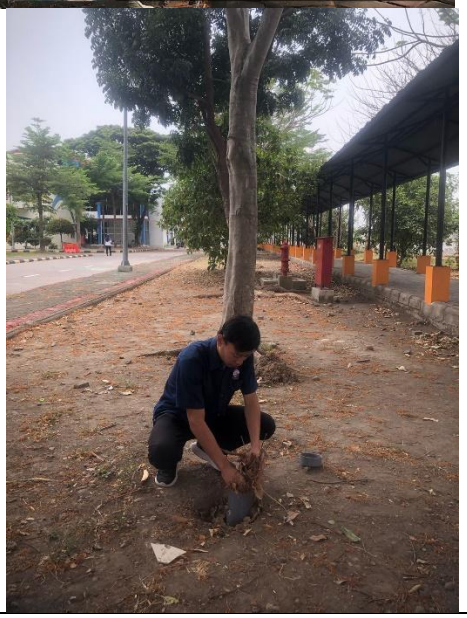
University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.3] Organic Waste Treatment

Type of waste	total	amuount (ton)			
		reduced	reused	upcycled	downcycled
organic					
- food waste	2,6			1,5	
- leaf	40,14			31,08	
Total Trash	**42,74**	**Total Waste Managed**		**32,58**	
Percentage of Amount of Waste Managed to that Generated		**76,22 %**			

Management of Organic Medical Waste in the Form of Food Leftovers using the BSF method



Management of Organic Waste in the Form of Dry Leaves using the Biopori method

Management of Organic Medical Waste in the form of food scraps and leaves that are thrown into the landfill

Description:

There are several types of organic waste produced by PPI Madiun, including: solid food waste and dry leaves. Besides office areas and classes, organic waste is often produced by dining rooms, canteens, cooperatives and green open spaces. PPI Madiun has committed to managing organic waste by managing organic waste from products resulting from activities starting from temporary storage to final management starting from recycling, namely using the BSF method, processing for animal feed to making compost fertilizer and in collaboration with other parties: Winongo TPA at Madiun City. The temporary storage process is divided into 2 places: temporary storage place for solid food waste and dry leaf waste.

The process of managing food waste organic solid waste starts from placing closed organic waste bins at all points of the building at PPI Madiun, then every day the waste is collected at the temporary storage place for food waste solid organic waste and then weighed and recorded.

Next there are three management stages, the first of which is managed using the BSF (Black Soldier Fly) method, as animal feed and the rest was handed over to the Winongo TPA. The BSF method is a method of processing organic waste using larvae (maggots) of BSF flies. The BSF maggots have the ability to degrade organic waste

faster than other insects. Yet, the method of feeding livestock is by processing leftover food to be given to livestock at PPI Madiun (Goats and Fish).

The dry leaf waste management process begins with cleaning up leftover leaves in green open spaces by the community service staff at the PPI Madiun, then collecting them and weighing and recording them, then the leaf waste is managed using the Biopori method. The Biopore method is a way of making water absorption holes in the ground to overcome standing water and increase the absorption capacity of rainwater. Biopori is a soil conservation method that has many benefits. The working principle of biopori is to make a hole in the ground and fill organic waste in it. Organic waste will trigger soil biota such as worms, ants and plant roots to create cavities in the soil). Apart from the Biopori method, leaf waste management is also carried out by utilizing empty land. First, make sure the land to be used is far from the well. Leave a distance of about ten meters. Then, dig the land approximately 1.5-2 meters wide and 1 meter deep. Put all the organic waste in the house (leaf waste) into the hole. To disguise the smell, add composted soil on top. Do this every day until the dug hole is full. Once full, then cover with soil. Press the soil until the dug hole is completely covered by soil. The organic waste will undergo composting. After three months, the compost can be used to fertilize the soil.

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

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Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.6] Total volume inorganic waste produced

Type of inorganic waste	Total Produced (ton)
- plastic bottles	3,584
- food plastic	3,168
- paperboard	2,764
- iron	0,123
Total	9,639

Description:
The types of inorganic waste produced by PPI Madiun are paper, plastic and metal waste. Organic paper waste consists of leftover office paper, used cardboard, and other paper waste. Plastic waste consists of plastic bottles, food wrappers, plastic bags and other plastic waste. Metal waste consists of metal materials left over from production and training that are no longer used. The amount or volume produced is based on the season that occurs at PPI Madiun.

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.7] Total volume inorganic waste treated

Type of waste	Amount (ton)				
	total	reduced	reused	down-cycled	up-cycled
inorganic non-toxic	9,639		1,236	1,150	0,090
- plastic bottles	3,584		0,1	1,150	
- food plastic	3,168				
- paperboard	2,764		1,136		
- iron	0,122				0,090
Total managed		2,476			
Percentage		25,69 %			

Description:
PPI Madiun has committed to manage organic waste by processing Inorganic waste from products produced from activities starting from temporary storage to final management starting from reuse, recycling or in collaboration with other parties.

In the process of managing inorganic waste by reuse, there are several paper and plastic wastes that can be reused, for example:

1. Cardboard or cardboard boxes are reused for packaging and storage,
2. Paper that is only used on one side is reused as note paper, drafts, or for other activities

In the process of managing inorganic waste using a cycle method, there are several plastic bottles and iron waste that are processed, for example:

1. Reusing iron waste into useful items, such as chairs, tables, display media for practical equipment, etc
2. Plastic bottles sold to collectors are processed into useful goods

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.8] Inorganic Waste Treatment

PPI Madiun Inorganic Waste Management

Reuse and processing of Madiun PPI Inorganic waste

Description:

The types of organic waste produced by PPI Madiun are paper, plastic and metal waste. This organic waste apart from office and lecture units is often produced by printing presses, canteens and cooperatives. PPI Madiun has committed to managing organic waste by managing organic waste from products resulting from activities

starting from temporary storage to final management starting from reuse, recycling or in collaboration with other parties. By managing organic waste from products resulting from activities starting from temporary storage to final management, starting from recycling iron waste resulting from practices, reusing used cardboard and bottles, as well as collaborating with other parties Winongo landfill (TPA) at the Madiun City. The temporary storage process is divided into 2 places: temporary storage place and final disposal place.

In the process of managing organic waste by reuse, there are several paper and plastic wastes that can be reused, for example:

1. Carton boxes or cardboard are reused for packaging and storage at various activities and events both at PPI Madiun and at External Service activities,
2. Paper that is only used on one side is reused as note paper, drafts, or for other activities
3. Reusing plastic bottles as a medium for growing plants.

In the process of managing inorganic waste using a cycle method, there are several plastic bottles and iron waste that are processed, for example:

1. Reusing iron waste into useful items, such as chairs, tables, display media for practical equipment, etc
2. Plastic bottles sold to collectors are processed into useful goods

PPI Profile: https://www.youtube.com/@ppiacid
A video is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : ww.ppi.ac.id

[3] Waste (WS)

[3.9] Total volume toxic waste produced

Code	Type of toxic waste	Total Produced (ton/year)
B107d	- electronic waste including cathode ray tubes (CRT), fluorescent lamps, Printed Circuit Boards (PCB) and metal wire	0.5
B105d	- Used lubricating oil includes used hydraulic, engine, gear, lubrication, insulation, heat transmission, grit chambers, separator and/or mixtures thereof.	5
A337-1	- Clinical waste has infectious characteristics	0.15
A337-2	- Expired pharmaceutical products	0.0017

Description:
There are several types of hazardous medical waste produced by PPI Madiun, including: electronic goods, advanced cloth, used lubricating oil, used lamps, used toner, clinical waste having infectious characteristics, and expired pharmaceutical products. Hazardous medical waste is mostly generated by health and laboratory units. PPI Madiun has committed to managing hazardous waste by managing waste from products resulting from activities starting from temporary storage to final management in collaboration with the third party: PT. ArahEnvironmental, for the destruction process.

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.10] Total volume toxic waste treated

Type of waste	Code	Amount (ton/year)				
		total	reduced	reused	down-cycled	up-cycled
- electronic waste including cathode ray tubes (CRT), TL lamps, Printed Circuit Boards (PCB) and metal wire	B107d	0.5			0.47	
- Used lubricating oil includes used hydraulic, engine, gear, lubrication, insulation, heat transmission, grit chambers, separator and/or mixtures thereof.	B105d	5		3,75		
- Clinical waste has infectious characteristics	A337-1	0.15				
- Expired pharmaceutical products	A337-2	0.0017				
TOTAL TOXIC WASTE MANAGEMENT		**5.6517**		**3,75**	**0.47**	

Description:
There are 3 processing methods for processing hazardous medical waste at PPI Madiun, including: reduced, reused, and down-cycled. The concept of reduced is to reduce the amount of waste produced. Reduced is to reuse goods or materials that can still be used after the first use, while down-cycled is a recycling process that produces products with lower quality and function than the original product. The reduced program for processing electrical waste includes using electrical devices that have a long useful life, using electronic devices correctly so that they are used optimally. The reused program uses used lubricating oil in this activity. Used oil and oil waste is reused for maintenance of railway practical equipment. The down-cycled program collaborates with third parties to collect hazardous medical waste and destroy it using an incinerator.

A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

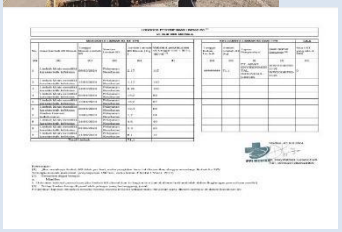
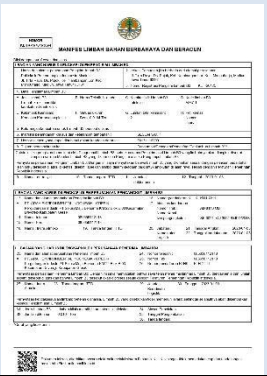
[3] Waste (WS)

[3.5] Toxic Waste Treatment

Type of waste	Code	amount (ton/year)				
		total	reduced	reused	down-cycled	up-cycled
- electronic waste including cathode ray tubes (CRT), fluorescent lamps, Printed Circuit Boards (PCB) and metal wire	B107d	0.5			0.47	
- Used lubricating oil includes used hydraulic, engine, gear, lubrication, insulation, heat transmission, grit chambers, separator and/or mixtures thereof.	B105d	5		3,75		
- Clinical waste has infectious characteristics	A337-2	0.15				
- Expired pharmaceutical products	B107d	0.0017				
Total Toxic Waste Management		**5.6517**	**Managed Waste**		**4,22**	
Percentage of Toxic Waste Management generated		**74,66 %**				






  	    
Toxic B3 Waste Management (Indonesian Railway Polytechnic Madiun)	**Management of Infectious Medical Solid Waste and Expired Medicine (Indonesian Railway Polytechnic Madiun)**

Video of Toxic Waste Treatment is available on the link : https://bit.ly/PengangkutanLimbahMedisPPI

Description:

There are 3 processing methods for processing hazardous medical waste at PPI Madiun, including: reduced, reused, and down-cycled. The concept of reduced is to reduce the amount of waste produced. Reused is to reuse goods or materials that can still be used after the first use, while down-cycled is a recycling process that produces products with lower quality and function than the original product. The reduced program for processing electrical waste includes using electrical devices that have a long useful life, using electronic devices correctly so that they are used optimally. The Reused Program uses used lubricating oil. In this activity, used oil waste is reused for maintenance of railway practical equipment. The down-cycled program collaborates with third parties to collect hazardous medical waste and destroy it using an incinerator.

The medical waste management process is:

- Appoint clinical team members who have certificates in medical waste management, one of which is K3 (Occupational Health and Safety) and Hiperkes to form a PPI (Infection Control and Prevention) team to create medical waste management guidelines;

- Next, the PPI team makes a schedule for transporting medical waste once a week/if the medical waste is full;
- After being transported, the medical waste is weighed, recorded in a logbook, and stored at a temperature below 0^0C in accordance with applicable laws and regulations due to collection of medical waste within three months;
- Finally, after 3 months the medical waste will be transported by a third party (PT. Arah Environmental) and then filled in on the Siraja website as administrative proof that infectious medical solid waste has been transported in accordance with applicable laws and regulations.

Meanwhile, other toxic B3 (Toxic and Hazardous Materials) waste management processes are:

- Sorting B3 waste in the trash bins provided in each building;
- Carry out transportation to a temporary storage place and then record it in the logbook;
- Next, the waste management team sorts out which waste can be reused (used oil) and reused (used lamps, used iron and cloth).
- Furthermore, goods that cannot be reused or recycled are transported by a third party (PT. Arah Environmental) once a year.

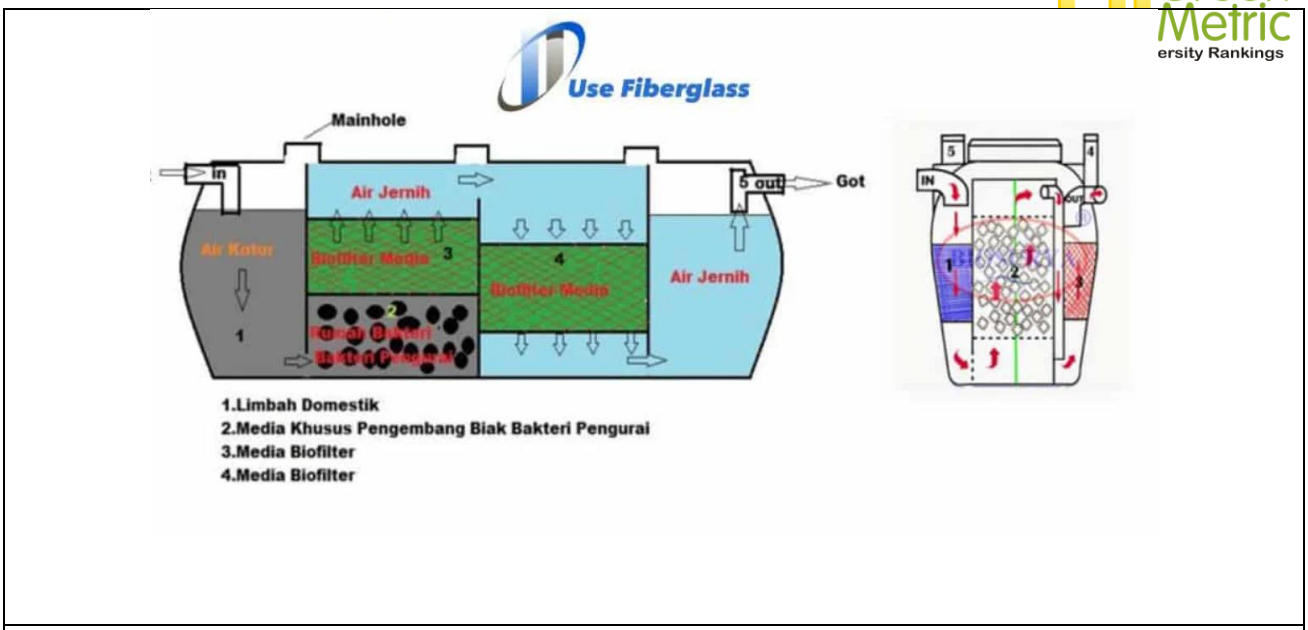
A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.6] Sewage Disposal



Sewage Disposal PPI Madiun

Description:

PPI Madiun has used Biofilter type wastewater treatment (Sewage Disposal). Where liquid waste from toilets is processed using microorganisms to degrade organic materials and reduce pollution. This system works through several stages:

1. Sewage Filtration: Waste from the toilet enters the biofilter, where solid waste will sink to the bottom and liquid waste will rise to the surface. The liquid waste is then channeled to the biological treatment system.
2. Decomposition by Microorganisms: Microorganisms in the biofilter will decompose organic waste, producing methane gas which can be used as fuel. The processed liquid waste is then filtered through a filter media to remove solid particles.
3. Disposal of Clean Water: After treatment, the cleaned water can be discharged into the sewer or reused, depending on applicable environmental standards.

PPI Madiun Profile: https://www.youtube.com/@ppiacid
A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

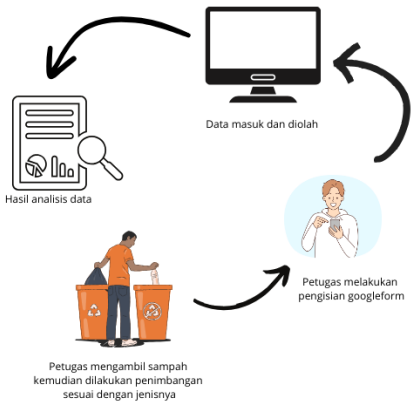
UI GreenMetric Questionnaire

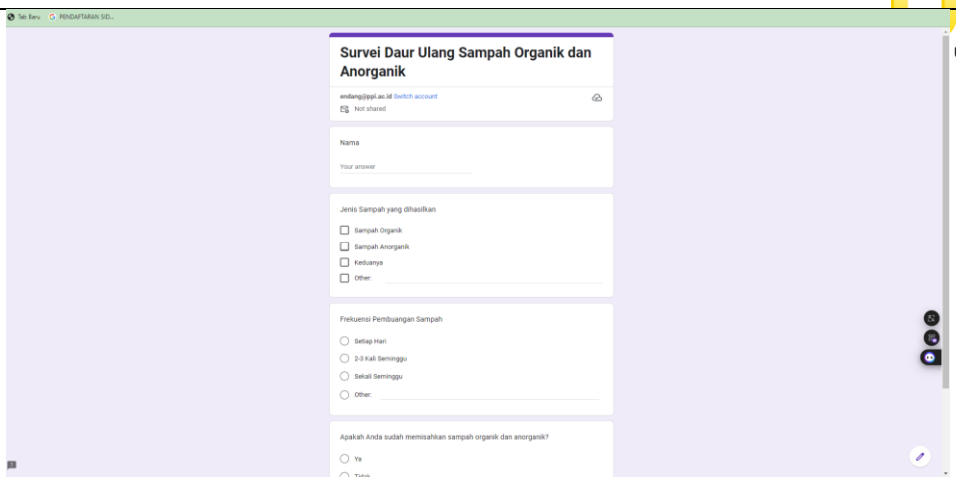
University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[3] Waste (WS)

[3.13] Planning, implementation, monitoring and/or evaluation of all programs related to Waste Management through the utilization of Information and Communication Technology (ICT)

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Initial survey of waste type and volume	Google form for data collection	Completed survey form	September 2024	Waste Management Team
Implementation	Socialization about the importance of recycling	Social Media, Posters and flyers	Photo of outreach activities	September 2024	Waste Management Team
Monitoring	Monitoring types of waste	Google spreadsheet for analysis	Respondent's monthly report	Ongoing	Waste Management Team
Evaluation	Data analysis	Google spreadsheet for evaluation	Analysis graph	Ongoing	Waste Management Team





Description:

- Planning: Initial survey to identify the type and volume of waste in the campus environment by creating a Google form which will then be filled in by the officer on duty.
- Implementation: Create a Google Form containing relevant questions and distribute it through the community WhatsApp group
- Monitoring: Using Google Spreadsheet to monitor the amount and type of waste reported
- Evaluation : Using Google Spreadsheet to analyze the collected data. The results of the data analysis are then made into graphs to visualize the type of waste and the volume produced

PPI Madiun Profile: https://www.youtube.com/@ppiacid
A video of waste management is available on the additional evidence link:
https://drive.google.com/file/d/1yUxAd0bM4YtsRmvpjB2z7-eQ-1jROSlZ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[4] Water (WR)

[4.1] Water conservation program & implementations

	The Lake of Campus of PPI Madiun Flood Control, Environmental Ecosystems, Aesthetics and Recreation, Learning and Research, Water Resources

Description:

1. **Lake**

PPI Madiun has implemented a lake conservation program as part of efforts to preserve the environment and lake ecosystem. This lake plays an important role as a water source and habitat for fish. In addition, the lake serves as a rainwater catchment basin, which helps to maintain water supplies as well as reduce the risk of floods around the campus area.

Water from the lake is used for watering plants and irrigation on campus agricultural land. The water control system is equipped with a rotary handle that regulates the flow of water. When the volume of water in the lake exceeds capacity, the water controller is opened to drain the water into the river. On the contrary, if the river overflows, the controllers will be closed to prevent water from flowing into the lake, so that the volume of water is maintained and does not increase the risk of flooding.

Parameter	Mark
Area	4.572,29 m^2
Volume Air	45.726,9 m^3
Average Depth	10 m

2. Sanitation

In terms of water use for sanitation activities in the campus area, PPI Madiun uses water from the ground, which is then filtered before finally being distributed throughout the campus area. Each building has a pump and temporary reservoir to collect water. Water is pumped into reservoirs located on the roof area of each building. Filling the reservoir takes place automatically, when it reaches the limit, the pump will turn off. This is to prevent water from overflowing and avoid damage to the system and ensure efficient use of water. With this automatic system, water supply management becomes more effective and safer.

Volume Ground Water Tank Per Tahun	109.500 m^3
Sanitation Needs Per Year	106.045 m^3

3. Biopore

Biopori is also implemented in campus areas as an effort to conserve water and soil. The following are the specifications of the biopore environment at PPI Madiun.

Diameter	4 inch
High	1,5 meter
Volume	12,154 liter
Number of biopores	184
Number of volumes	2,236.336 liters or 2.236 m^3
Total volume of water produced per year	816,14 m^3

4. Rainwater Harvesting System

Rainwater is a very potentially valuable and relatively clean water source. By collecting rainwater, we can reduce rainwater runoff, recharge groundwater, and increase the availability of clean water.

Rainwater is collected from the roof of the building using gutters or rainwater collection systems specifically designed to collect rainwater that falls from the roof. Rainwater will flow through the gutter and then go to the lake as a central water reservoir. When the lake is unable to accommodate the volume of rainwater, the water will be released into the river in front of the campus area.

Roof area (m2)	11.015,06 m^2
Rain duration	3 hours
Average Rainy Days per year	111 days
Rainwater volume	13.204,85 m^3

Water use efficiency

Total Water Requirements Per year	
Toilet, hand washing, shower	106.045 m^3
Plant watering and irrigation	21.258,53 m^3
Drinking water	949,2 m^3
Washing Vehicles	282,2 m^3
Total	**128.534,9** m^3
The total volume of water resulting from conservation	
Biopore	816,14 m^3
Rainwater harvesting system	13.204,85 m^3
Lake water	45.726,9 m^3

Total Water Requirements Per year	
Total	**58.931,75** m^3

Efficiency: $\frac{The\ total\ volume\ of\ water\ resulting\ from\ conservation}{Total\ water\ requirements\ at\ PPI\ Madiun} x\ 100\%$

$$\frac{58.931{,}75\ m^3}{128.534{,}9\ \ m^3} x\ 100\ \%$$

45,85%

[1] None. Please select this option if the conservation program is needed, but nothing has been done.

[2] Program in preparation

[3] 1 - 25% water conserved

[4] > 25 - 50% water conserved

[5] > 50% water conserved

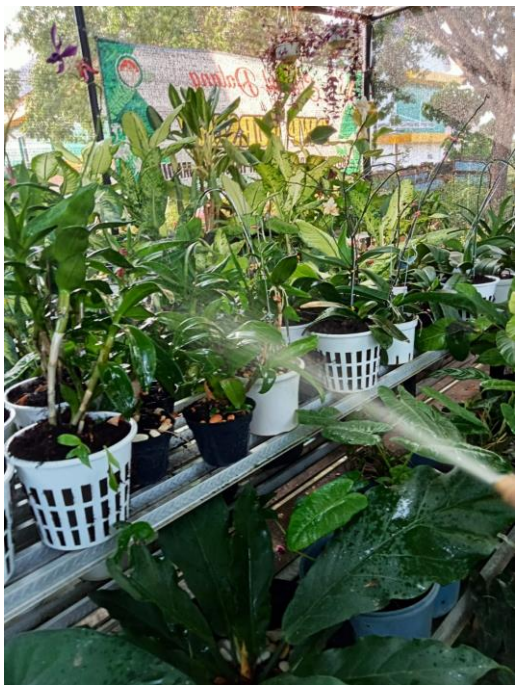
PPI Madiun Profile: https://www.youtube.com/@ppiacid
Videos and Pictures of water conservation program & implementations Additional evidence link:
https://bit.ly/3Ykp8oi
https://drive.google.com/drive/folders/1W2R2mzHfyrBBnrOF-QZr9_VjLBgY5ECm

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[4] Water (WR)

[4.2] Water recycling program implementation



#1
Water
sprinkling

Description:

PPI Madiun has implemented an innovative rainwater management system by utilizing lakes in the campus area. The collected rainwater is reused for various purposes, such as plant maintenance. This water is distributed through a piping system connected to sprinklers spread throughout the garden area, as well as taps for manual watering.

The water supply for the agricultural irrigation system at PPI Madiun also comes from lakes. This water is routed through channels that have been provided around the land to facilitate its distribution. Water from the lake is also used in vehicle washing activities, making it more environmentally friendly and economical.

Total water use	
Plant watering and irrigation	21.258,53 m^3
Washing vehicles	282,2 m^3
Total	**21.540,73** m^3
recycled water source	58.931,75 m^3

Amount of water recycled = $\frac{21.540,73\ m^3}{58.931,75\ m^3} x\ 100\%$

= 36,55%

[1] None. Please select this option if a conservation program is required, but no action has been taken yet.

[2] Program in preparation

[3] 1 - 25% water saved

[4] > 25 - 50% water saved

[5] > 50% water saved

PPI Madiun Profile: https://www.youtube.com/@ppiacid)
Videos and Pictures of waste recycling program is available on the additional evidence link:
Water UI Green Metric
Water recycling program implementation

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[4] Water (WR)

[4.3] Water efficient appliances usage




#1
Toilet, urinal, sink and hand washing area

Description:

PPI Madiun in supporting environmental sustainability and optimal resource management carries out a water use efficiency program. Several steps to realize this efficiency are through the technology application that can save water use without risking function and comfort.

One of the efforts made is to have system settings flushing toilets. On average, toilets in PPI Madiun are equipped with a dual flush system which allows users to choose the amount of water used, adjusted to their needs. This helps reduce unnecessary water use, especially when only a small amount of cleaning water is required. The application of a manual press faucet is also an efficient solution. Once pressed, this faucet is able to close the water channel itself, thereby minimizing water waste due to forgetting to turn off the faucet.

Appliance	Total Number	Total number water Efficient appliances	Percentage
Toilet	534	531	98,33%
Urinal	161	161	100%
Hand washing facilities	611	34	5,56%
		Average Percentage	**67,96%**

Apart from installing water-saving equipment, outreach has also been carried out to reduce water use through posted posters.

PPI Madiun Profile: https://www.youtube.com/@ppiacid),
Video and Pictures of water efficiency are available on the additional link:
Water UI Green Metric
Water efficient appliances usage

[1] < 20% of water efficient appliances installed
[2] 20 - 40% of water efficient appliances installed
[3] > 40 - 60% of water efficient appliances installed
[4] > 60 - 80% of water efficient appliances installed
[5] > 80% of water efficient appliances installed

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[4] Water (WR)

[4.4] Consumption of treated water

	#1 The main campus of PPI Madiun

Description:

At PPI Madiun, water consumption covers various needs, such as drinking water, watering plants and irrigation, washing vehicles, washing hands, bathing and requiring toilet water. Water sources to meet this need come from two main places, those are **ground water tanks** and **lakes**. Ground water tanks are used to accommodate groundwater, while lakes are an additional water source to meet irrigation and plant watering needs. The combination of these two sources ensures sufficient water supply for daily activities at PPI Madiun.

No	Item	Volume Air (m3)
1	Drinking water	949,2
2	Plant Watering and irrigation	21.258,53
3	Vehicle Washing	282,2
4	Air toilet, wash hands, shower	106.045
Grand Total		**128.534,93**
Water sources		
1	Ground Water Tank/ GWT	**109.500**
2	Lake	**45.726,9**
Grand Total		**155.226,9**

Percentage of water consumed = $\frac{Amount\ of\ water\ consumed}{Water\ sources} x\ 100\%$

= $\frac{128.534,93}{155.226,9} x\ 100\%$

= 82,80%

[1] None
[2] 1 - 25% of treated water is consumed
[3] > 25 - 50% of treated water consumed
[4] > 50 - 75% of treated water is consumed
[5] > 75% of treated water is consumed

PPI Madiun Profile: https://www.youtube.com/@ppiacid)
Video and Pictures are available on the additional evidence link:
Water UI Green Metric
Consumption of treated water

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[4] Water (WR)

[4.5] Water pollution control in the campus area

#1
WWTP

Description:

Controlling water pollution at PPI Madiun is an important part to maintain environmental quality and to improve the health of the ecosystem around the campus. PPI Madiun, as an institution that cares about environmental sustainability, can take strategic steps to prevent and control water pollution.

One of the main steps in controlling water pollution is by wastewater treatment. Liquid waste originating from campus activities such as dormitories, canteens and laboratories must go through a processing process first before being discharged into the environment.

The Waste Water Treatment Plant (IPAL) system is used to separate hazardous substances and ensure that the waste water discharged meets safe water quality standards.

[1] Water pollution control policies and programs are currently in the planning stage
[2] Water pollution control policies and programs are currently under construction
[3] Water pollution control policies and programs are still in the initial implementation stage.
[4] Water pollution control policies and programs are fully and occasionally implemented monitored
[5] Water pollution control policies and programs are fully implemented and monitored periodically.

PPI Madiun Profile: https://www.youtube.com/@ppiacid)
Video and Pictures are available on the following link:
Water UI Green Metric
Water pollution control in the campus area

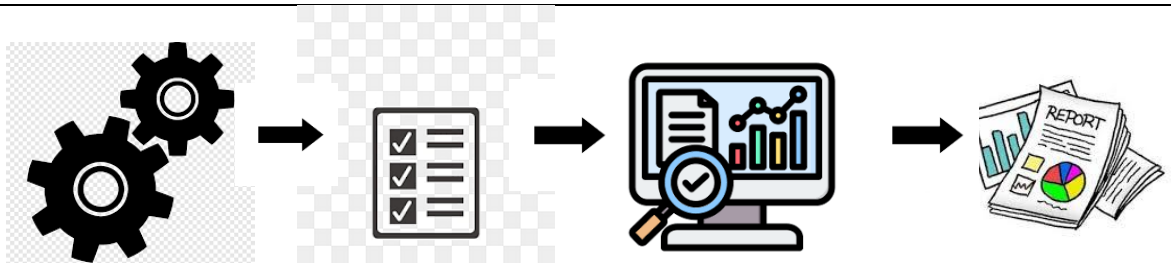
UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun
Country : Indonesia
Web Address : www.ppi.ac.id

[4] Water (WR)

[4.6] Planning, implementation, monitoring and/or evaluation of all programs related to Water Management through the utilization of Information and Communication Technology (ICT)

Stage	Activities/ Programs	ICT Utilization	Evidence	Timeline	Responsible Team/ Department
Planning	sistem pemantauan terhadap ketinggian air dan kualitas air	memakai sensor ketinggian air, menggunakan google form untuk mencatat data	database pemantauan ketinggian air dan kualitas air	september 2024	tim pengelola air
Implementation	memasang sensor ketinggian air di danau, membuat google form untuk mencatat data kualitas dan distribusi air	aplikasi pemantauan	dokumentasi	september 2024	tim pengelola air
Monitoring	pemantauan hasil pencatatan	google spreadsheet dengan tabel pivot	laporan rekap per bulan	sedang berlangsung	tim pengelola air
Evaluation	analisis data	google spreadsheet untuk evaluasi	grafik analisis	sedang berlangsung	tim pengelola air

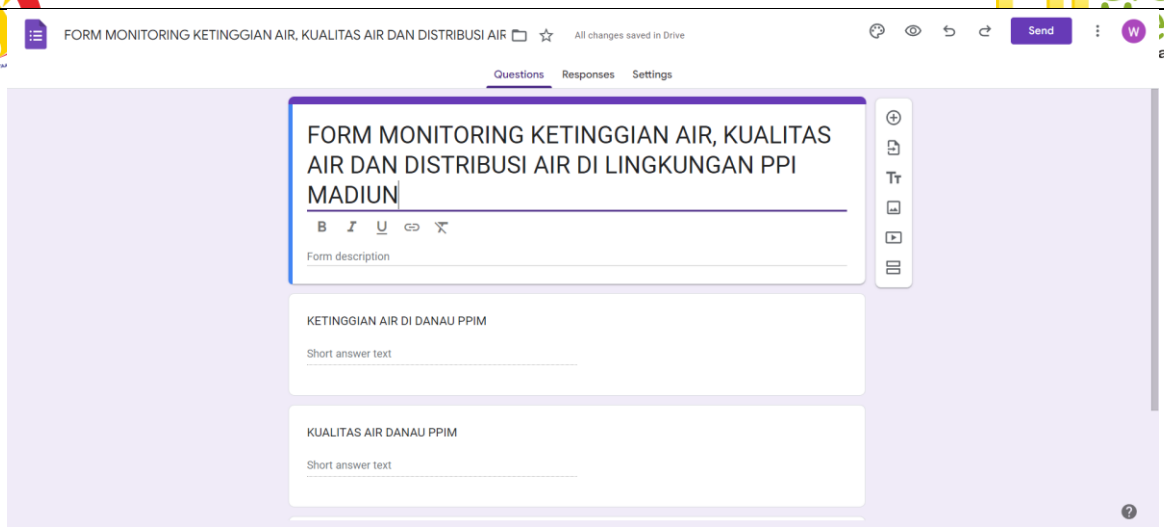


sensor ketinggian air dan alat water quality tester

aplikasi blynk yang dihubungkan ke smartphone dan google form untuk pencatatan data

monitoring menggunakan google spreadsheet

evaluasi menggunakan google spreadsheet



google form untuk mencatat data monitoring

Description:

- planning : membuat sistem monitoring ketinggian air dan kualitas air. untuk mencatat datanya menggunakan google form
- implementation : ketinggian air danau menggunakan sensor ketinggian air dan aplikasi blynk, untuk kualitas air menggunakan alat water quality tester
- monitoring : menggunakan google spreadsheet untuk mengolah data monitoring yang sudah diinput dari google form
- evaluation : menggunakan google spreadsheet untuk menganalisis data yang terkumpul, hasil analisis data yang berupa grafik analisis. apabila terdapat lonjakan air dan kualitas air yang memburuk maka dapat segera ditangani.

(Our Profile: https://www.youtube.com/@ppiacid)
Additional evidance link :

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.4] The total number of vehicles (cars and motorcycles) divided by total campus population

No	Vehicle	Total Number
1	Car managed by the university	22
2	Car entering the university	20
3	Motorcycles entering the university	95
	Total	137

#1
The main campus of PPI Madiun

5.4 = 137 / 813 = 0.17

Description:

1. The total number of academicians at the PPI Madiun reached 813 people, including teaching staff, education staff, and cadets currently studying.
2. Of the 813 people at the PPI Madiun, there are 137 vehicles, including official vehicles and private vehicles.
3. The campus environment of the PPI Madiun has 137 vehicles, of which there are 22 official vehicles for employee use and 115 private vehicles (20 cars and 95 motorbikes).
4. Based on the comparison results between the number of vehicles available in the campus environment and the population at PPI Madiun, the result obtained was 0.17, which falls into category number 3.

PPI Madiun: https://www.youtube.com/@ppiacid
Additional evidence link:
Video
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing
Photo
https://drive.google.com/drive/folders/1XP01GwGBBTvcnRtdxfBOvYfU8eTqpog9?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.5] Shuttle services

The patrev at PPI Madiun is equipped with an electric system

Free shuttle service using Hiace

Shuttle Bus Routes

#1
The main campus of PPI Madiun

Description:

The PPI Madiun shuttle operates during specific hours, connecting key points within PPI Madiun, including the rectorate, dormitory, and workshop. This service provides convenient transportation for students and staff, eliminating the need for private vehicles. One of the eco-friendly shuttle vehicles runs on electric power, which aligns with sustainability goals. The campus shuttle service is vital in promoting sustainability by providing efficient mobility and reducing the overall carbon footprint. The campus has established pedestrian pathways to interconnect vital areas, including the mosque, rectorate, auditorium, classes, dormitories, polyclinics, laboratories, and workshops, creating a pedestrian-friendly environment throughout the campus.

PPI Madiun Profile: https://www.youtube.com/@ppiacid
Additional evidence link:
Video
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing
Photo
https://drive.google.com/drive/folders/1Xr-UqbzsGH7Fgo9dknAmsqRBdMmiX6ik?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.9] Zero Emission Vehicles (ZEV) availability on campus

Track Motor Car (TMC) at PPI Madiun utilizing an electric motor system

The patrev at PPI Madiun is equipped with an electric system

#1
The main campus of PPI Madiun

1st generation lorries at the front and 2nd generation lorries at the back, both utilizing an electric system   an electric bicycle owned by an employee at PPI Madiun	

Description:

In the PPI Madiun area, various zero-emission vehicles (ZEVs) are offered, including Track Motor Car (TMC), 1st generation Lori and 2nd generation Lori, Patrev, Electric Bicycle, and Electric Motor. While there are currently no electric vehicle charging stations on campus, policies and regulations are in place to support the use of ZEVs, such as rental or vehicle-sharing programs. Facilities that promote zero-emission vehicles (ZEVs) are already in place, although not fully developed. These include dedicated parking for electric vehicles and an adequate number of charging stations. The campus is also actively involved in programs and initiatives to educate the campus community about the benefits of ZEVs and how to use them. Additionally, PPI Madiun features dedicated bicycle lanes and pedestrian pathways that connect the entire campus, with bicycle lanes also available on public roads and ample bicycle parking within the campus area.

PPI Madiun Profile: https://www.youtube.com/@ppiacid
Additional evidence link:
Video
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing
Photo
https://drive.google.com/drive/folders/1EBe-1_fcERXNJg4z351M_ON2cd2ueEFj?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.11] The total number of Zero Emission Vehicles (ZEV) divided by total campus population

Number	Vehicle	Total
1	managed by the university	4
2	entering the university	6
Total Number		10

#1
The main campus of PPI Madiun

Description:

1. There are numerous emission-free vehicles in the PPI (Number of ZEV) = 10
2. The entire population on campus comprises:
   a. 654 students (statistics as of August 2024),
   b. 154 employees,
   c. and 5 daily visitors.
3. Ratio:

$$\text{Ratio} = \frac{Total\ of\ ZEV}{The\ entire\ population\ on\ campus} = \frac{10}{813} = 0{,}012$$

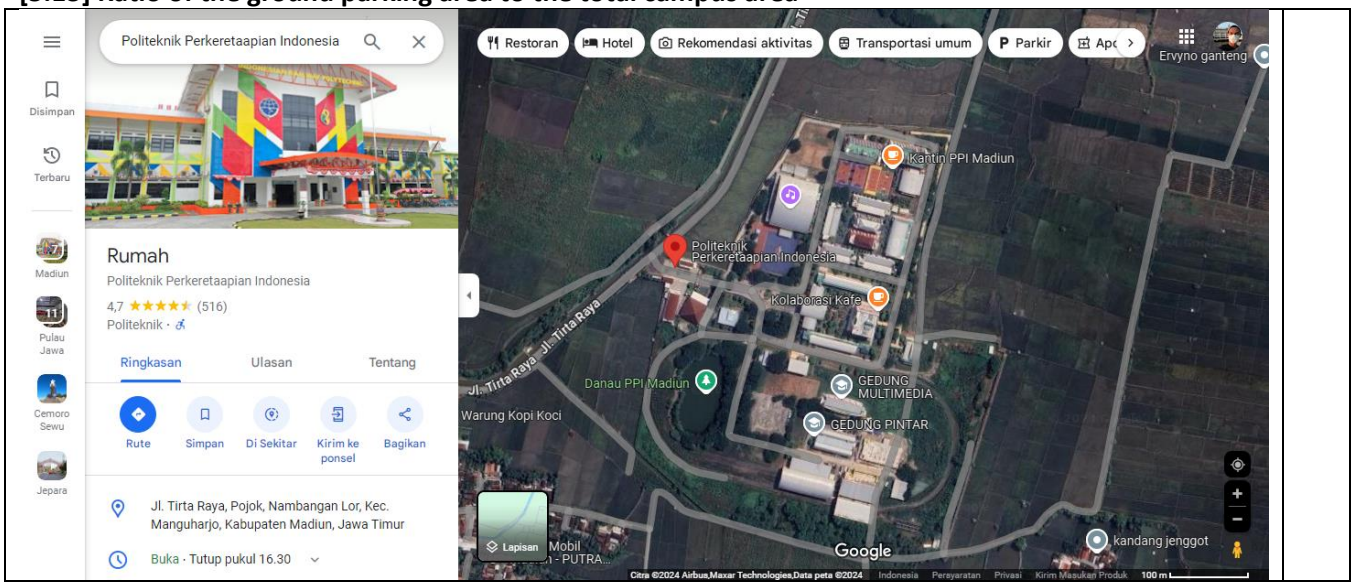
PPI Madiun Profile: https://www.youtube.com/@ppiacid
Additional evidence link:
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.13] Ratio of the ground parking area to the total campus area



Description:

Total main campus area = 179.981 m^2
Total parking area = 1.000 m^2
Car Parking Area = 300 m^2
Motorcycle Parking Area = 500 m^2
Bicycle Parking Area = 200 m^2

Ratio = **0.00556**

PPI Madiun Profile: https://www.youtube.com/@ppiacid
Additional evidence link:
Video
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing
Location on Google Maps
Politeknik Perkeretaapian Indonesia - Google Maps

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.14] Program to limit or decrease the parking area on campus for the last 3 years (from 2021 to 2023)

	#1 The main campus of PPI Madiun

Description:

1. Limit parking zones for the entire academic community and conduct awareness campaigns: to educate the campus community about the benefits of sustainable transportation and the negative impacts of excessive car use.
2. Free to rent bicycles on campus, build the Bicycle lanes: Construct safe and well-maintained bicycle lanes on campus.
3. Pedestrian walkways: Improve pedestrian walkways and crossings to make walking more accessible.
4. Electric vehicles for transportation on campus: Electric vehicles (EVs) offer a sustainable and efficient solution for campus transportation. By transitioning to EVs, campuses can reduce their carbon footprint, improve air quality, and create a more environmentally friendly environment.
5. Monitoring and evaluation: Continuously monitor the effectiveness of implemented programs and make necessary adjustments.

   By implementing a combination of these strategies, campuses can effectively limit or decrease the parking area, promoting sustainable transportation and improving the overall campus environment

#1
The main campus of PPI Madiun

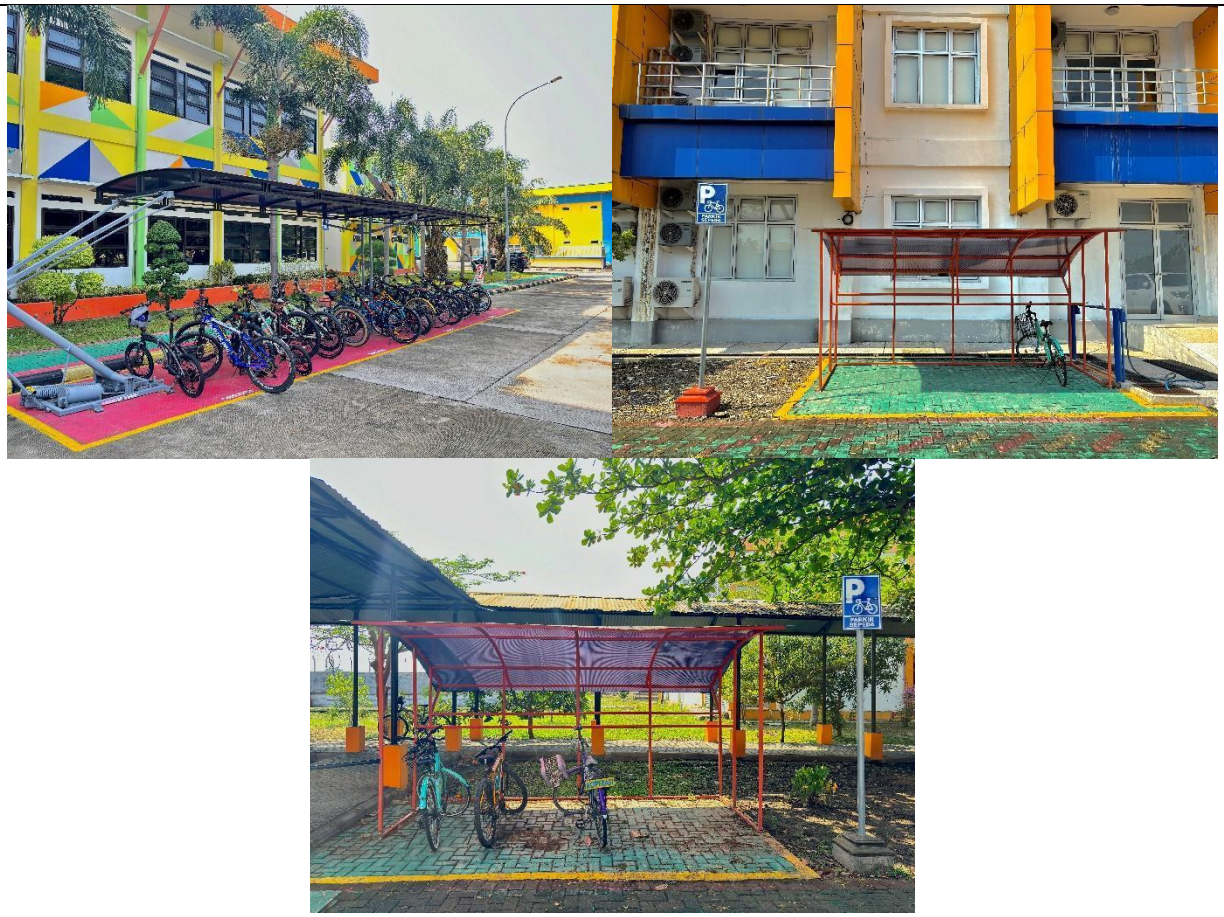
PPI Madiun Profile: https://www.youtube.com/@ppiacid
Additional evidence link:
Video
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing
Photo
https://drive.google.com/drive/folders/1ftP-Fzt6v4X69AI7R2qGRTfOYs1gh_Ee?usp=sharing

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[5] Transportation (TR)

[5.15] Number of Transportation Initiatives to Decrease Private Vehicles on Campus



Free Bicycle for Rent

Shuttle Vehicles For Mobility Within The PPI Madiun Campus

Description:

1. The free bicycle-for-rent program at PPI Madiun has been introduced to reduce staff use of private vehicles while promoting eco-friendly mobility. By using these bikes, staff can move quickly and efficiently between campus facilities without needing motor vehicles. In addition to reducing emissions and pollution, the program aims to create a greener and healthier campus environment. These free bikes provide convenience for daily mobility, encourage an active lifestyle, and support the campus's efforts to maintain environmental sustainability.
2. The shuttle vehicles on the PPI Madiun are provided to facilitate the mobility of students, staff, and guests from one location to another. These shuttles operate on routes connecting the campus's main facilities, such as the rectorate, classrooms, library, dormitories, workshops, laboratories, and more, making it easier to access various points without walking long distances. With the shuttle service, travel within the campus becomes more efficient, especially for those with busy schedules or when the distances between facilities are considerable. In addition to providing comfort, this shuttle service also supports reducing personal vehicle use on campus, helping preserve the environment by using electric power.
3. Students on the PPI Madiun are required to walk as part of an initiative to create a healthier, more orderly, and environmentally friendly campus. This policy is implemented to reduce the use of motor vehicles within the campus area, thereby decreasing air pollution and noise. Additionally, walking encourages students to be more physically active, improves their health, and provides opportunities to engage with their surroundings. With a campus design that supports pedestrians, including safe and comfortable walkways, this policy is expected to foster a more conducive, green, and sustainable campus.

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Additional evidence link:
Video
https://drive.google.com/file/d/10ikVWsCCV_cijkoMlR8qH2CwaUIJMxOQ/view?usp=sharing
Photo
https://drive.google.com/drive/folders/1pokcs_n8C_INAPAxY7qiVHSiBwgfq8DT?usp=sharing

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[5] Transportation (TR)

[5.16] Pedestrian Path Policy on Campus





pedestrian, guiding block, dan ramp in PPI Madiun

Description:

1. The pedestrian paths within the PPI Madiun are designed to provide comfort and safety for students, staff, and guests. These paths connect the campus's main facilities, such as classrooms, the library, cafeteria area, dormitories, workshops, laboratories, places of worship, and more, making it easier to move around the campus.
2. The solar-powered lights installed along the pedestrian paths on the PPI Madiun are part of efforts to promote sustainability and energy efficiency. These lights use solar energy stored during the day to provide adequate illumination at night, ensuring the paths remain safe and comfortable. With this eco-friendly technology, the campus reduces electricity consumption and contributes to lowering its carbon footprint. In addition to being functional, the solar-powered lights enhance the campus environment with their modern design and soft lighting.
3. To support accessibility, it is also equipped with guiding blocks and special paths in the form of textured tiles designed to help the visually impaired navigate. These guiding blocks guide their steps safely to various campus facilities. In addition, the campus also provides disability-friendly ramps, making it easier for wheelchair users or those with limited mobility to access buildings around the campus without difficulty.

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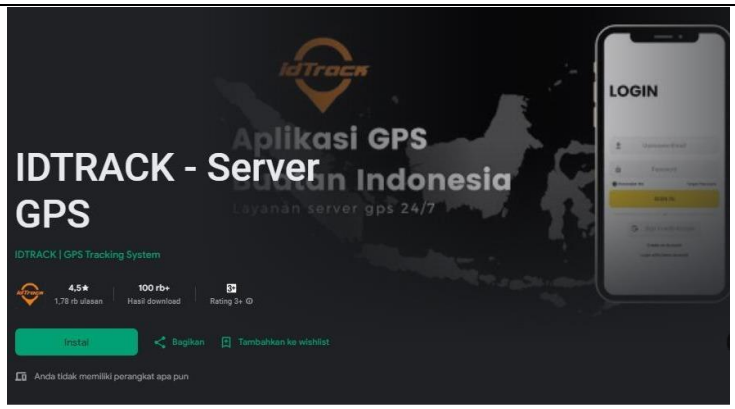
[5] Transportation (TR)

[5.18] Planning, implementation, monitoring, and/or evaluation of all programs related to Transportation through the utilization of Information and Communication Technology (ICT)

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Detect the location of the campus' bicycle	• GPS Tracker • Campus' bicycle • Application	• Campus' bicycle installed with GPS Tracker • App installed on users' mobile phone	October 2024 - February 2025	• Div of Internal Affair • IT Unit
Planning	Detect the location of the shuttle car (inside campus)	• GPS Tracker • Shuttle car • Application	• Shuttle car installed with GPS Tracker • App installed on users' mobile phone	October 2024 - February 2025	• Div of Internal Affair • IT Unit
Planning	Detect the location of the shuttle car/shuttle bus (outside campus)	• GPS Tracker • shuttle car/shuttle bus	• Shuttle car /shuttle bus installed with GPS Tracker • App installed on users' mobile phone	October 2024 - February 2025	• Div of Internal Affair • IT Unit
Implementation	Procurement of GPS Tracker as needed	• GPS Tracker	• Campus' bicycle and shuttle car installed with GPS Tracker • Apps on users' mobile phones	March 2025 - April 2025	• Div of Internal Affair • IT Unit
Monitoring	by usage	Real-time tracking software	• by usage	June 2025 - July 2025	• Div of Internal Affair • IT Unit
Evaluation	Evaluate shuttle service efficiency	Data analysis tools, user feedback surveys	• Efficiency reports, survey results	Annually	• Div of Internal Affair • IT Unit



Mini GPS Tracker and mobile apps

#1
The main campus of PPI Madiun

Shuttle cars, shuttle buses, and bicycles will be equipped with GPS Tracker

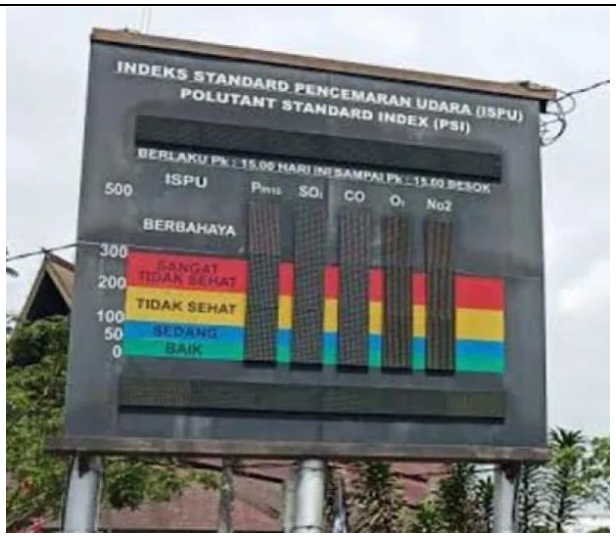
Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Controlling the cars/motorcycles' circulation	• Tapping-Gate (motors and cars, separated) • Dedicated (tapping) card	• Tapping-Gate installed at the entrance gate •	Completely installed	• Div of Internal Affair • IT Unit
Implementation	Register each employee's ID card to the system	Card programmer	• Every employee uses the tapping card to enter/exit the campus	January 2025	• Div of Internal Affair • IT Unit
Monitoring	by usage	Real-time (ID card) vehicle counting software	by usage	Feb 2025	• Div of Internal Affair • IT Unit
Evaluation	Evaluate (or limit) the number of vehicles entering (and exit)	Data analysis tools, user feedback surveys	survey results	six month	Div of Internal Affair IT Unit




A tapping gate is installed at the main gate, where the motor-gate and car-gate are separated

#1
The main campus of PPI Madiun

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Measure the air quality	Carbon monoxide meter	Carbon monoxide meters were installed at several locations inside campus	October 2024 - February 2025	Div of Internal Affair IT Unit
Implementation	Installation Carbon monoxide meter	Carbon monoxide meter	Carbon monoxide meters were installed at several locations inside the campus	March 2025 - April 2025	Div of Internal Affair IT Unit
Monitoring	Periodic Inspection	Monitoring air quality in the campus environment	Controlled air quality	June 2025 - July 2025	Div of Internal Affair IT Unit
Evaluation	Evaluate the air quality	Data analysis tools, user feedback surveys	survey results	Every six month	Div of Internal Affair IT Unit



Carbon monoxide meter to measure the air quality

#1
The main campus of PPI Madiun

Description:

GPS Tracker

- **Planning:** Assess the number of GPS Tracker needs.
- **Implementation:** Install GPS Tracker to shuttle bus/shuttle cars and bicycles, install mobile app to all employees' mobile phone, based on the decree SK-PPIM 417 Tahun 2024 director determination of guidelines for information system development in Politeknik Perkeretaapian Indonesia Madiun https://drive.google.com/file/d/1uh-qqmp4a2PUZE8RRO1iwWkflKK8h69G/view?usp=sharing
- **Monitoring:** Track shuttle and bicycle usage. Employ real-time tracking software to monitor shuttle locations, passenger numbers, and bicycle users.
- **Evaluation:** Evaluate the efficiency and effectiveness of the shuttle and bicycle services. Use data analysis tools to assess performance metrics and gather user feedback through surveys.

Tapping-gate

- **Planning:** due to the installment of the tapping-gate completed, the planning focused on assessing the number of tapping-cards needed.
- **Implementation:** provision/distribute the tapping card to all employees, based on the decree SK-PPIM 417 Tahun 2024 director determination of guidelines for information system development in Politeknik Perkeretaapian Indonesia Madiun https://drive.google.com/file/d/1uh-qqmp4a2PUZE8RRO1iwWkflKK8h69G/view?usp=sharing
- **Monitoring:** monitoring the number of vehicles entering and exiting the campus.
- **Evaluation:** Evaluate the number of vehicle circulation inside the campus.

Carbon monoxide meter

- **Planning:** Assign 2 locations to install the carbon monoxide meter to measure the air quality in the campus environment.
- **Implementation:** Everyone can see the installation of a carbon monoxide meter in a strategic location in real-time, based on the decree SK-PPIM 417 Tahun 2024 director determination of guidelines for information system development in Politeknik Perkeretaapian Indonesia Madiun https://drive.google.com/file/d/1uh-qqmp4a2PUZE8RRO1iwWkflKK8h69G/view?usp=sharing
- **Monitoring:** Regular maintenance and calibration, to maintain the tool's performance and record reading data periodically.
- **Evaluation:** Evaluate the air quality to improve safety and health in risky environments.

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Photo
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UI GreenMetric Questionnaire

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[6] Education and Research (ED)

[6.1] Number of courses/subjects related to sustainability offered

A. D-III BUILDING AND RAILWAY TECHNOLOGY

No	Course Title	Note
1	Railway Infrastructure Technology	This course provides about technological developments in the field of railway infrastructure so students are able to master the concept of future vehicle technology, where one of the achievements is being able to analyze and classify the use of environmentally friendly technology in components and construction work methods.
2	Professional Ethics and Work Culture	Professional ethics and work culture courses are provided to provide knowledge and practice of transparency, responsibility and integrity, while sustainable work culture encourages environmentally and socially friendly practices. With both, students can justify and identify positive impacts on society and the environment.
3	Materials Science	The materials science courses given focus on the development and use of environmentally friendly and efficient materials. This includes the study of materials that have minimal impact on the environment, such as recycled materials, biomaterials, or materials that reduce the carbon footprint. By understanding the properties and performance of various materials, students can design and identify more sustainable products and processes, optimize resource use and minimize waste.
4	Building Components and Railway Tracks I	The building components and railway tracks I course is given in a sustainability context focusing on design and construction for the scope of railways and railway bridges that prioritizes resource efficiency and minimal environmental impact.

No	Course Title	Note
5	Building Components and Railway Tracks II	The building components and railway tracks II course is given in a sustainability context focusing on design and construction for the scope of tunnels and other civil buildings in the railway sector that prioritizes resource efficiency and minimal environmental impact.
6	Building and Railway Track Systems Engineering	This course is provided to provide knowledge related to the application of energy efficiency, environmental management, impact reduction as well as mobility and accessibility in building systems and railway lines.
7	Construction Management	This course is to provide construction management principles that can help produce projects that are not only economically efficient but also sustainable and environmentally responsible.
8	Building and Railway Track Maintenance I	The railway building and track maintenance course is given in the context of sustainability, focusing on practices and strategies that ensure infrastructure, including railways and bridges, remains efficient and environmentally friendly and continues to function as specified by design.
9	Hydrology and Hydraulics	In the hydrology and hydraulics courses, learning is provided regarding more efficient and environmentally friendly management of water resources, so it is able to support the design and development of rail transportation on a sustainable and environmentally friendly basis.
10	Construction of Buildings and Railway Tracks I	In the building and railway track construction I course, learning material is provided regarding designing and implementing standard operational procedures that integrate sustainability principles in every stage of building and railway track construction. Deep understanding of environmentally friendly construction methods, equipment and stages, taking into account the efficient use of natural resources, waste management and minimizing impacts on the ecosystem.
11	Building and Railway Track Maintenance II	The railway building and track maintenance course is given in the context of sustainability, focusing on practices and strategies that ensure infrastructure, including tunnels, stations and other supporting buildings, remains efficient and environmentally friendly and continues to function as specified by design.
12	Testing of Buildings and Railway	In the railway building and track testing course, learning

No	Course Title	Note
	Tracks	material is provided related to the principles of sustainability in the implementation, supervision, inspection and testing of railway infrastructure. Skilled in applying environmentally friendly methods and techniques in managing railroad, bridge, tunnel and station building construction components. Able to carry out inspections and tests using the latest technology to ensure the long service life of these assets. In addition, accustomed to collecting and reporting data accurately and efficiently to support sustainable decision making.
13	Transportation and Environment	The transportation and environment course is designed to provide an understanding of how transportation systems, especially railways, can be designed and operated taking into account sustainability principles. The material includes studies on the basics of transportation, the environmental impacts of railway infrastructure projects, as well as the application of AMDAL as a tool for measuring and managing environmental risks. The ultimate goal is to equip students with the ability to assess railway projects from a sustainability perspective and propose innovative solutions to achieve environmentally friendly transport
14	Construction of Buildings and Railway Tracks II	The building and railway track construction II course aims to equip students with the skills to manage resources sustainably, master effective bridge and tunnel construction techniques, and apply standard operating procedures in accordance with regulations, in order to produce graduates who are ready to contribute to sustainable infrastructure development.

B. D-III RAILWAY ELECTRICAL TECHNOLOGY

No	Course Title	Note
15	Electrical Measurements	This course is provided to make the students understand the importance of electrical measurements in supporting sustainability initiatives and optimizing the use of energy resources in the railway sector.
16	Electronic Network I	This course is provided to help students understand the relationship between electronics and sustainability, as well as prepare them to face challenges in the energy and environmental fields in the railway sector
17	Electric Circuit I	This course aims to equip students with knowledge that can be implemented in electricity in the context of energy management and utilization so as to realize energy saving

No	Course Title	Note
		and environmental friendliness in the railway sector.
18	Technology Digital	This course aims to equip students with the skills needed to develop and apply digital technology in digitalization in the railway sector to create an energy efficient and environmentally friendly railway system.
19	Algorithms and Programming Languages	This course provides students with an in-depth understanding of how algorithms and programming can be applied to improve railway operations with good energy efficiency and environmental friendliness.
20	Electronic Computer Applications	This course equips students with the skills needed to apply computer and electronics technology for emission reduction, energy efficiency, integrated transport and sustainable train operations
21	Railway Electrical Substation	This course provides students with an in-depth understanding of how electrical substation systems can contribute to sustainability in railway operations, where the aim is to operate trains with low emissions, high energy efficiency and an integrated operating system.
22	Electronic Circuits II	This course aims to provide an in-depth understanding of advanced electronic circuits and their application in a sustainability context, especially in the railway sector. Students will learn how electronic technology can be used to increase energy efficiency, reduce environmental impact, and support sustainable transportation systems.
23	Electrical Circuits II	This course is designed to equip students with advanced knowledge about electrical circuits and their applications in efficient and environmentally friendly energy management. The main focus is the application of electrical technology to support sustainability in the railway sector.
24	Sensors And Actuators	This course aims to provide an understanding of sensor and actuator technology and its application in improving sustainability in the railway sector. Students will learn how this technology can be used to optimize operations, reduce environmental impact, and increase energy efficiency.
25	Control System	This course aims to equip students with the knowledge and skills in control systems necessary to design and implement sustainable technological solutions in the railway sector. Students will learn about the theory and application of control systems in improving operational efficiency and sustainability.

No	Course Title	Note
26	Telecommunication Basics	This course aims to provide a basic understanding of telecommunications principles and their application in improving the sustainability of the rail transportation system. Students will study various telecommunications technologies that support operational efficiency, safety and minimal environmental impact.
27	Electrical Materials Science	This course aims to provide an understanding of the properties of electrical materials and their application in supporting sustainability in the railway sector. Students will learn about efficient, environmentally friendly materials and the latest technology used in train electrical systems
28	Transportation And Environment	The transportation and environment course is designed to provide an understanding of how transportation systems, especially railways, can be designed and operated taking into account sustainability principles. The material includes studies on the basics of transportation, the environmental impacts of railway infrastructure projects, as well as the application of AMDAL as a tool for measuring and managing environmental risks. The ultimate goal is to equip students with the ability to assess railway projects from a sustainability perspective and propose innovative solutions to achieve environmentally friendly transport
29	Professional Ethics and Work Culture	This course aims to equip students with an in-depth understanding of professional ethics and work culture that supports sustainability in the railway industry. Students will learn about relevant ethical principles, professional responsibilities, and how a positive work culture can influence sustainable practices.
30	Railway Signaling Interlocking	This course aims to provide an in-depth understanding of interlocking systems in railway signaling and how their application can improve operational sustainability. Students will study working principles, the latest technology, and the impact of this system on efficiency and safety in train operations.
31	Visual Programming And Interfaces	This course aims to provide an understanding of visual programming and user interface (UI) development that supports sustainability in the railway sector. Students will learn programming techniques that can be applied to create efficient and environmentally friendly applications.
32	Railway Electric Signaling	This course aims to provide an understanding of electrical signaling systems in railways and how their application can support operational sustainability. Students will learn

No	Course Title	Note
		working principles, the latest technology, and the impact of these systems on efficiency and safety.
33	Microcontroller System	This course aims to provide an understanding of controller systems, especially microcontrollers, and their application in supporting sustainability in the railway sector. Students will learn how to design and implement microcontroller-based solutions that are efficient and environmentally friendly.
34	System Programmable Logic Control (PIC)	This course aims to provide an understanding of the Programmable Logic Control (PLC) system and its application in supporting sustainability in the railway sector. Students will learn how to design, implement and optimize PLC-based control systems that are efficient and environmentally friendly.
35	Railway Telecommunications	This course aims to provide an understanding of telecommunication systems in railways and how their implementation can support sustainability. Students will study telecommunications technologies that improve operational efficiency and safety in the railway sector.
36	Upstream Electricity Transmission and Distribution	This course aims to provide an understanding of overhead electricity transmission and distribution systems and their application in supporting sustainability in the railway sector. Students will learn technologies that increase energy efficiency and minimize environmental impact.
37	Project Management	This course aims to provide an understanding of project management in the context of sustainability in the railway sector. Students will learn methodologies, techniques and best practices in managing projects focused on efficiency, environmental impact and sustainability.
38	Operations Facility Design	This course aims to provide an in-depth understanding of operational facility design, especially in signaling and telecommunications systems, in the context of sustainability in the railway sector. Students will learn the principles of efficient and environmentally friendly design, as well as how to implement strategies that support operational sustainability. Through needs analysis, application of the latest technology, and effective resource management, students will be equipped with the skills to design systems that not only meet safety standards, but also contribute positively to the environment.
39	Electrical Machines	This course aims to provide an in-depth understanding of electric engines and their application in the context of

No	Course Title	Note
		sustainability in the railway sector. Students will learn the basic principles of electrical machines, including various types of machines and how they work, as well as focus on energy efficiency. In addition, students will explore how electric engine technology can be integrated to support sustainable railway operations, including the use of renewable energy and reduced environmental impact. With this approach, students are expected to be able to design innovative and environmentally friendly solutions in the railway system.
40	Operations Facility Testing	In this lesson, students are taught about the importance of testing in maintaining safety, efficiency and the environmental impact of railway operations. They will learn appropriate testing techniques, performance analysis, and environmental impact evaluation of these systems. With this approach, students are expected to be able to design and implement innovative and sustainable solutions in the railway industry.
41	Maintenance and Inspection of Operational Facilities	This course aims to provide an in-depth understanding of the maintenance and inspection of signaling, telecommunications and electrical systems in the context of sustainability in the railway sector. Students will learn the importance of efficient maintenance to ensure these systems function optimally and support environmentally friendly operations.
42	Railway Automatic Signaling System	This course aims to provide an in-depth understanding of automatic signaling systems in the context of sustainability in the railway sector. Students will study the technology and methodology used in automated signaling systems, as well as their impact on operational efficiency and reduced environmental impact.
43	Telecommunication Transmission Engineering	This course aims to provide an in-depth understanding of telecommunications transmission techniques used in the railway sector, with a focus on sustainability. Students will study various transmission methods, the latest technologies, and their impact on operational efficiency and reduced environmental footprint.
44	Electronic Instrumentation	This course aims to provide an in-depth understanding of the principles and applications of electronic instrumentation in the context of sustainability in the railway sector. Students will study various types of instruments used for measurement and control, and their impact on operational

No	Course Title	Note
		efficiency and reduced environmental impact.

C. D-III RAILWAY MECHANICAL TECHNOLOGY

No	Course Title	Note
45	Combustion Motor Engineering	The combustion motor engineering course equips students with an in-depth understanding of main drive systems in railway facilities, especially in the context of performance optimization and energy efficiency. Students will be invited to analyze the pulling force of locomotives, identify the properties of combustion engines, and evaluate the latest technologies that can reduce emissions and increase the sustainability of rail transportation. Thus, graduates have the competencies needed to contribute to the development of a more environmentally friendly transportation system
46	Regulatory Engineering and Digital Electronics	The digital electronics and regulatory engineering course provides an understanding of various number systems, from the familiar decimal numbers to the binary, octal, hexadecimal and duodecimal number systems that are often used in digital data representation. Next, students will study basic logic and various types of logic gates which are fundamental components in building efficient digital circuits. An in-depth understanding of registers such as JK Flip-Flop and SISO equips students with the knowledge to design reliable and dependable digital systems. By mastering this material, it is hoped that students will be able to contribute to the development of environmentally friendly and sustainable digital technology.
47	Pneumatic And Hydraulic Engineering	This course provides students with an in-depth understanding of the design and maintenance of sustainable pneumatic and hydraulic control systems. Students will be able to design efficient and environmentally friendly systems, as well as carry out regular maintenance to ensure optimal performance and long service life. In this way, students can actively contribute to efforts to reduce energy consumption and minimize environmental impacts in industry.
48	Thermodynamics	This course invites students to explore an in-depth understanding of the principle of conservation of energy and its application in the context of thermodynamics. By studying the law of conservation of energy, students are invited to appreciate the limitations of natural resources and the importance of energy efficiency. Furthermore, through a deep understanding of thermodynamics, students are able to analyze various energy processes that occur in the universe, as well as design innovative solutions to overcome increasingly complex energy

No	Course Title	Note
		challenges.
49	Air Conditioning Engineering	In this course, the students learn effective methods for calculating cooling loads arising from various building elements, such as walls, roofs and glass, as well as dynamic loads due to changes in environmental conditions. In addition, students are invited to analyze the air humidification and dehumidification processes, as well as the effect of mixing air with water on the cooling load. Skills in designing efficient and sustainable cooling installation layouts are also honed, with a focus on head loss calculations and equivalent pipe lengths. Through this course, it is hoped that students will be able to design optimal, energy efficient and environmentally friendly building cooling systems, as well as contribute to realizing sustainable buildings.
50	Materials Technology	This course invites students to explore the principles of materials mechanics with a sustainable approach. Through an in-depth understanding of axle systems, partial differentials, and stress and strain analysis, students will be able to evaluate the performance of various types of structures and materials, especially those used in the railway industry. In this way, students are expected to be able to contribute to designing and building efficient, safe and environmentally friendly transportation infrastructure. The material that is discussed includes basic concepts of material mechanics, stress and strain analysis in beams, as well as calculations of transverse forces and bending moments. A comprehensive understanding of this material equips students with the skills needed to optimize material use, reduce waste, and increase the service life of railway infrastructure.
51	Mechatronics	This course provides students with an in-depth understanding of the application of electronic principles in modern railway and industrial systems. Through in-depth study, students are able to optimize energy use and minimize environmental impacts through programmed control of electrical and mechanical systems. Thus, graduates have the competence to contribute to the development of more sustainable transportation and industrial systems, in line with global sustainability principles.
52	Mechanical Technology	This course invites students to explore the concept of axial and partial differential systems as a foundation for an in-

No	Course Title	Note
		depth understanding of the mechanical behavior of materials. Armed with this knowledge, students are able to carry out comprehensive evaluations of mechanical components on various facilities. The ability to identify and explain the function of each component is not only important in the context of maintenance, but also in efforts to design sustainable, innovative solutions. Through a deep understanding of material mechanics, students are expected to be able to contribute to the development of more efficient and environmentally friendly technology.
53	Electric Driven Facilities	This course invites students to dive into the world of sustainable electric rail transportation. Through an in-depth understanding of electric trains and their components, students are invited to analyze efficient and environmentally friendly drive systems. Apart from that, students will also study braking systems and optimal distribution of electric current, in order to maximize the performance of electric trains in supporting sustainable urban mobility. In this way, students are expected to be able to contribute to the development of greener railway technology and be able to answer future mobility challenges.
54	Non-Driven Means	This course equips students with an in-depth understanding of sustainable management of railway facilities. Students will learn to carefully identify various components of railway facilities, from efficient placement of locomotives to optimal procedures for filling carriages. In addition, students will study the applicable regulations regarding the arrangement of train trains, both for passengers and goods, with the aim of maximizing operational performance while maintaining safety and security. Through a comprehensive understanding of the special equipment used in rail operations, students are able to contribute to efforts to reduce environmental impacts and increase energy efficiency in the rail transportation sector.
55	Maintenance and Inspection of Railway Facilities	This course equips students with an in-depth understanding of sustainable maintenance practices for non-electrical driven facilities. The material that is discussed includes types of treatment, optimal treatment goals, as well as classification of effective treatment cycles and groupings. Students are trained to identify the need for precise maintenance of facilities, both at the depot

No	Course Title	Note
		and at the service center. In this way, students are expected to be able to optimize facility performance, extend their service life, and minimize environmental impacts through implementing sustainable maintenance practices.
56	Machine Elements	This course invites students to dive deeply into the world of machine elements. With a sustainable approach, students will be invited to not only become familiar with the types, functions and technical applications of machine elements, but also understand how these elements play a role in a more efficient and environmentally friendly production system. This comprehensive understanding will equip students with skills in designing and selecting optimal machine elements, so that they can contribute to creating sustainable industrial solutions.
57	Quality And Project Management System	This course leads students to understand in depth the principles of sustainable project management. The students are equipped with the ability to define and analyze various aspects of project management, from planning to implementation. Special focus is placed on developing skills in carrying out accurate cost and time estimates, taking into account sustainability factors such as environmental and social impacts. In addition, the students learn effective and efficient procurement procedures, and understand the importance of comprehensive procurement documents in supporting the achievement of sustainable project goals.
58	Maintenance and Inspection of Railway Facilities II	This course equips students with an in-depth understanding of sustainable maintenance practices for non-electrical driven facilities. Through in-depth study of various types of maintenance, maintenance objectives, and maintenance cycles, students are able to optimize asset performance and extend the service life of facilities. Apart from that, this course also focuses on the identification and classification of appropriate maintenance in the depot environment, so that it can contribute to maintaining operational sustainability and reducing environmental impacts. Thus, graduates have relevant competencies to manage assets efficiently and responsibly, in line with sustainability principles.

No	Course Title	Note
59	Transportation And Environment	This course hones students' abilities in designing and building integrated, or intermodal, transportation models. Students explore how transportation systems, especially trains, interact with the surrounding environment. With an in-depth understanding of exhaust emissions and other environmental impacts, students will be able to evaluate and design sustainable transportation solutions
60	Operating Techniques for Driven Facilities	This course equips students with comprehensive locomotive operational skills, both electric and non-electric locomotives. Through simulation practice, students will be trained to operate trains in various track conditions and facilities that may be encountered in the real world, including in emergency situations. This knowledge and skills are not only important to ensure the smooth operation of trains, but also contribute to improving energy efficiency and safety in rail transport, in line with sustainability principles.
61	Design and Engineering of Facilities	This course equips students to design and evaluate simple mechanical systems on railway facilities from a sustainability perspective. Students learn to design mechanical systems that not only meet functional needs, but also consider energy efficiency, minimized environmental impact, and resilience to climate change. Apart from that, this course also provides an in-depth understanding of the concept of sustainability in the railway context, starting from basic understanding to the role of technology in overcoming environmental challenges. In this way, graduates are expected to be able to contribute to the development of a more sustainable and environmentally friendly railway system
62	Facility Testing and Certification	This course equips students with an in-depth understanding of the preparation of important documents in railway testing, with a focus on sustainability aspects. Students will learn to design a comprehensive Test Minutes Concept, prepare efficient test administration, and formulate a sustainable facilities operation worthiness test certificate sheet concept. Through this course, it is hoped that students can contribute to realizing a safe, reliable and environmentally friendly railway system.
63	Professional Ethics	This course provides an in-depth understanding of the foundations of ethics and morals in the context of professionalism. understand the concepts of ethics,

No	Course Title	Note
		morals and character, and how these values form responsible individuals. Furthermore, this course specifically discusses professional ethics, including the application of a code of ethics, analysis of cases of violations, and the importance of ethical communication in the world of work. Apart from that, students are invited to dig deeper into the characteristics of professionalism, work ethic and sustainable work culture. Using real-world examples, especially from the railway sector, this course aims to equip you with the knowledge and skills necessary to contribute positively to building an ethical, productive and sustainable work environment.

D. D-III RAILWAY TRANSPORTATION MANAGEMENT

No	Course Title	Note
64	Computer Science I	This course equips students with computational skills relevant to the field of statics. Through exploring various software applications, students learn to implement the principles of statics effectively and efficiently. By mastering the various formulas and analytical tools available, students are able to evaluate and design sustainable physical structures. A sustainability-oriented approach is emphasized, so that students can contribute to creating engineering solutions that are environmentally friendly and have a positive impact on future generations.
65	Computer Science II	This course equips participants with operational skills in using the Visual Basic programming language. Participants will be invited to explore the potential of Visual Basic in creating sustainable, innovative solutions. Through a deep understanding of programming syntax and logic, participants are expected to be able to develop efficient and environmentally friendly applications. Thus, graduates become valuable assets in an industrial world that increasingly demands sustainable technological solutions.
66	Leadership And Decision Making	This course provides an in-depth understanding of the concepts of leadership and sustainable decision making. Students will be invited to explore how a leader can integrate sustainability principles in every action, from formulating an organizational vision that has a positive impact to making strategic decisions that consider environmental, social and economic aspects holistically.
67	Excellent service	This course provides students with an understanding of the concepts of customer satisfaction and excellent service in the

		context of business sustainability. Students are invited to understand the fundamental principles that underlie the creation of meaningful and sustainable customer experiences. This course also discusses in depth the standards and quality of service expected by customers in the modern era, as well as the various types of customers and the unique expectations they have. With this comprehensive understanding, students are expected to be able to contribute to building strong and sustainable relationships with customers, so that they can support long-term business sustainability.
68	Railway Transportation Economics	This course provides students with an in-depth understanding of sustainability evaluation of railway transportation projects. Through comprehensive economic and financial analysis, students are able to evaluate the long-term environmental, social and economic impacts of projects. In this way, students can contribute to the development of a transportation system that is not only efficient, but also sustainable and meets the needs of future generations.
69	Financial Management and Marketing	This course thoroughly examines the dynamics of the advertising industry in Indonesia, with a focus on the environmental and social impacts it causes. Students are invited to explore the evolution of advertising, from history to current trends, and analyze how advertising messages shape public perceptions and influence consumption behavior. This course also discusses in depth aspects of the advertising business, such as financial management, marketing planning, and sustainable media selection. With a comprehensive understanding, participants are expected to be able to design advertising strategies that are not only effective in achieving business goals, but also responsible for the environment and society.
70	Railway Safety	This course provides an understanding of the world of sustainable transportation, with a special focus on the railway sector. Students are taught to understand the basic concepts of railway safety which are integral in creating a safe and efficient transportation system. Apart from that, this course also discusses the basic principles of transportation in general, in order to provide a comprehensive understanding of the role of transportation in supporting sustainable development. In conclusion, students learn railway safety audit procedures, an important step in ensuring the quality and reliability of rail services.
71	Environmental Impact Analysis	This course discusses the complex interactions between

		transportation systems, especially railways, and the environment. Students are taught to explore the basics of transportation and understand how transportation activities, especially the construction of railway infrastructure, can have a significant impact on the ecosystem. Furthermore, this course will equip students with an in-depth understanding of Environmental Impact Analysis (AMDAL) as an important instrument in measuring and minimizing the negative impacts of railway infrastructure projects. By mastering the principles and methods of environmental impact assessment, students are expected to be able to make sustainable decisions in planning and implementing railway projects, so as to create a balance between economic growth and environmental preservation.
72	Modern Railway Technology	This course provides an in-depth understanding of the world of sustainable future transportation. With a focus on fast trains as an icon of modern mobility, students are invited to explore the latest technology that supports train operations. In addition, a basic understanding of information technology is an important provision for analyzing operational data and optimizing high-speed train performance. Through this course, it is hoped that students can contribute to the development of a transportation system that is efficient, environmentally friendly, and able to meet the mobility needs of society which continues to grow.
73	Railway Logistics Management	This course leads students to an in-depth understanding of sustainable railway logistics management. Through a comprehensive study, participants are able to explain the basic concepts, objectives and history of logistics management in the railway industry. Apart from that, this course also discusses in detail the practices of procurement, storage, distribution, payment, and disposal of logistics assets efficiently and responsibly. Students are equipped with knowledge about various logistics facilities, as well as sustainable planning and management strategies. Thus, graduates are expected to be able to contribute to optimizing a railway logistics system that is efficient, effective and environmentally friendly.
74	Train Performance Management	This course equips students with an in-depth understanding of comprehensive railway infrastructure performance evaluation. Through a sustainable approach, students will learn to calculate and analyze a variety of performance metrics, from energy efficiency to environmental impact. In this way, it is hoped that graduates will be able to contribute to the development of a railway system that is not only efficient, but also environmentally friendly and sustainable,

		thereby supporting the creation of quality and highly competitive public transportation.
75	Transportation Planning	This course hones students' abilities in understanding the transportation system as a whole, starting from existing types of transportation to planning sustainable transportation systems. Specifically, this course explores the train operating system as a mode of transportation that has great potential in reducing carbon emissions and supporting environmentally friendly mobility. Students are invited to analyze how complex train operating systems work, as well as evaluate their impact on the environment and society. In this way, it is hoped that students can contribute to designing innovative and sustainable transportation solutions for the future.
76	Transportation Modeling	This course provides students with learning to understand and explain fundamental concepts in transportation modeling. Students are invited to think about how an efficient and sustainable transportation system can be designed through a modeling approach. With in-depth understanding, students are able to contribute to creating environmentally friendly transportation solutions, reducing congestion, and improving the quality of life of the community
77	Station Systems and Management	This course equips students with an in-depth understanding of the application of sustainability principles in the management of rail transportation security and safety, especially in the station environment. Students learn holistic strategies for planning, implementing, and evaluating effective and efficient security systems in station environments and train travel. With a focus on risk mitigation, resource optimization, and improving passenger welfare, this course aims to create a rail transportation ecosystem that is safe, comfortable, and sustainable for all users.
78	Professional Ethics and Work Culture	This course equips students with the skills and attitudes needed to become professionals with responsibility and integrity in their field of expertise. Through in-depth learning, students hone their ability to work innovatively, provide excellent service, and always prioritize a sustainable work ethic. Thus, graduates are expected to be able to contribute actively to sustainable development, both in the work environment and society at large.
79	Conflict Management	This course equips students with in-depth analytical skills to identify the roots of complex problems facing the world today. By understanding the basic principles of problem

		solving methods, students are able to design innovative and sustainable solutions that are not only effective in the short term, but also contribute to the development of a better future for all living things and the environment
80	Dynamics of Movement of Means	This course equips students with an in-depth understanding of sustainable rail transportation systems. Through an in-depth study of the working mechanisms of automatic train operating systems, students are able to analyze and evaluate the efficiency and environmental impact of the system. In addition, understanding the dynamics of rolling stock movements enables students to design innovative solutions to improve the performance and capacity of rail transportation systems, while minimizing energy consumption and greenhouse gas emissions.
81	Corporate Risk Management	This course provides learning related to risk management and company operations from a sustainability perspective. Students will be trained to understand, analyze and manage business risks that can threaten the sustainability of the company and the environment. In addition, students also learn the principles of efficient and sustainable operations management, so they can contribute to creating a business that is not only financially profitable, but also has a positive impact on society and the environment.
82	Emergency Response Planning	This course equips students with an in-depth understanding of disaster risk management and sustainability. Students are invited to understand key concepts in emergency planning and emergencies, and apply them in the context of sustainable development. Through this course, students are expected to be able to design effective disaster mitigation strategies, build community resilience, and actively contribute to post-disaster recovery efforts, thereby creating a safer, fairer and more sustainable environment for future generations.
83	KA Network Loading And Scheduling Techniques	This course equips students with an understanding of optimal techniques for loading and arranging train trains. Through in-depth study, students are able to design circuit configurations that are not only operationally efficient, but also sustainable. In other words, students learn how to maximize train transport capacity without sacrificing aspects of safety, passenger comfort and energy efficiency. This knowledge is crucial in supporting an environmentally friendly and sustainable transportation system.
84	Railway Facilities Operation Techniques	This course equips students with an understanding of sustainable operating techniques for railway facilities. Through an in-depth study of the operational management

		of equipment, facilities and automated train systems, students will be able to optimize operational performance while still upholding the principles of work safety (K3). In this way, students are ready to contribute to the development of a rail transportation system that is efficient, safe and environmentally friendly, and able to meet the demands of sustainable future mobility.

E. RAILWAY TECHNICAL TRAINING

No	Course Title	Note
1	Testing of Railway Tracks and Buildings	Education and training on Railway Track and Building Testing is one of the training programs at PPI Madiun in maintaining the sustainability of the railway transportation system. This program equips professionals with in-depth knowledge and skills to ensure railway infrastructure including tracks, stations, bridges and other buildings operates optimally, safely and environmentally friendly. Through a series of comprehensive learning modules, students understand the principles of sustainable engineering, non-destructive testing techniques, and data management to support evidence-based decision making. Thus, graduates of this program will play an active role in realizing an efficient, reliable and sustainable rail transportation system, and contribute to future-oriented development.
2	Testing of Railway Operation Facilities	Education and training on Train Operation Facility Testing is one of the training programs implemented at PPI Madiun which emphasizes sustainable principles in ensuring the continuity of safe, efficient and environmentally friendly train operations. This program is designed to develop the competency of professionals in comprehensively evaluating all aspects of an operating facility, from the outdoor infrastructure (Money Orders, Facility Detectors and Signaling), to the exclusion system. By adopting a sustainable approach, this program not only focuses on technical aspects, but also encourages understanding of the importance of preserving the environment at every stage of testing. Participants are equipped with the knowledge and skills to identify potential risks, apply best practices in testing, and formulate innovative solutions that support greener and more sustainable rail transportation.
3	Testing of Electric Driven Railway Facilities	Education and training in testing electric-powered railway facilities is a crucial step in realizing sustainable transportation. This program not only produces a competent workforce in ensuring the safety and reliability of electric

No	Course Title	Note
		train systems, but also contributes to environmental preservation. By understanding electric train technology in depth, students can play an active role in optimizing energy use, reducing carbon emissions, and creating an environmentally friendly transportation system.
4	Testing of Non-Electric Driven Railway Facilities	Education and training in testing non-electric powered rolling stock is a strategic investment for a better future. This program produces a competent workforce in maintaining optimal performance of non-electric locomotives, both in terms of efficiency and reliability. In this way, we can reduce environmental impacts, increase operational efficiency, and ultimately provide better transportation services for society.
5	Executive Level Railway Facilities Nurse	Railway facility nurses play an important role in ensuring environmentally friendly train operations. Through comprehensive education and training, nurses can identify potential early damage, optimize energy use, and minimize negative impacts on the environment. For example, by carrying out regular maintenance on the exhaust system, train exhaust emissions can be reduced, thereby contributing to better air quality.
6	Implementing Level Railway Facilities Inspector	Education and training of implementing level railway facility inspectors is an important investment in ensuring the sustainability of train operations. Armed with adequate knowledge and skills, inspectors can detect early damage to railway facilities, thereby preventing travel disruptions that can be detrimental both economically and environmentally. Through optimal maintenance, the service life of railway facilities can be extended, reducing waste and minimizing energy consumption.
7	Maintenance of Railway Facilities with Electric Drives at Executive Level	Education and training in the maintenance of electrically powered railway facilities at the implementation level is a strategic step to build a transportation system that is socially, economically and environmentally sustainable. This program produces graduates who are able to maintain the reliability of electric trains, thereby ensuring smooth community mobility and supporting economic growth. In this way, we can reduce the negative impact of transportation on the environment, increase economic productivity, and create a fairer and more prosperous society.
8	Railway Operations Facilities Inspector	Through comprehensive education and training, railway operating facility inspectors can ensure that all aspects of safety and security are met. In this way, the risk of accidents can be minimized, and public confidence in rail

No	Course Title	Note
		transportation can be increased. In addition, trained inspectors can also identify potential improvements and increased efficiency in train operations, thereby contributing to cost savings and optimizing resource use.
9	Automated Rolling Stock Crew	Education and training of automated railway facility crews is a strategic investment in realizing sustainable transportation. This program aims to produce workers who are competent in operating and maintaining automatic train systems, so as to increase efficiency, safety and travel comfort. By adopting automatic train technology, we not only reduce energy consumption and greenhouse gas emissions, but also open up opportunities to develop a transportation system that is smarter and more responsive to society's needs. Through comprehensive training, train crews can optimize system performance, minimize operational disruptions, and contribute to sustainable city development.
10	Special Railway Facilities Crew	Specialized railway facility crew education and training is designed to equip the workforce with very specific skills, to support the efficient operations of the business entity. By deeply understanding the characteristics of the rolling stock used, crews can optimize asset performance, reduce downtime and increase overall productivity. This training also emphasizes the importance of regular maintenance to extend equipment life and reduce waste.
11	Assistant Railway Facilities Examiner	Education and training of railway rolling stock test assistants is a strategic investment for companies to increase operational efficiency and productivity. By equipping officers with relevant knowledge and skills, companies can ensure that rolling stock remains in top condition, minimize the risk of operational disruption, and ultimately improve overall company performance. This program is also in line with the principle of sustainability, where the company seeks to optimize resource use and reduce waste through effective asset maintenance.
12	Assistant Railway Infrastructure Examiner	Education and training for Railway Infrastructure Examiner Assistants is a strategic step in realizing sustainable railway transportation. This program not only produces a competent workforce in ensuring the safety and reliability of railway infrastructure, but also encourages the implementation of environmentally friendly practices. By understanding the environmental impact of rail operations, students can contribute to optimizing resource use, reducing carbon emissions, and building a greener transportation system.

No	Course Title	Note
13	Electric Power Line Maintenance	Education and training in railway power line maintenance (Upstream Power) contributes to sustainable development. This program not only produces a competent workforce, but also increases the resilience of energy infrastructure. By maintaining the reliability of the electricity system across railways, we can support economic growth, increase productivity and improve people's quality of life. Apart from that, this program can also create new jobs and reduce dependence on foreign workers.
14	Substation And Distribution System Equipment Inspection And Maintenance	Education and training on inspection and maintenance of substation and distribution system equipment is an important investment in realizing a sustainable energy system. This program aims to equip the workforce with the skills necessary to ensure the safe, efficient and reliable operation of electrical systems. By understanding in depth the critical components in an electric power system, students can play an active role in optimizing equipment performance, minimizing downtime and reducing waste. This program also encourages the adoption of the latest technology that is more environmentally friendly and energy efficient, thereby contributing to efforts to preserve the environment and mitigate climate change.
15	Railway Electrical Installation Training	Through training in electrical installations in the railway sector, it is hoped that graduates can play an important role in aspects of sustainability with several approaches, including energy efficiency, managing waste generated from installation and maintenance of electrical systems, including recycling components and hazardous materials. It is hoped that increased safety which is influenced by the suitability of electrical installations can be realized.

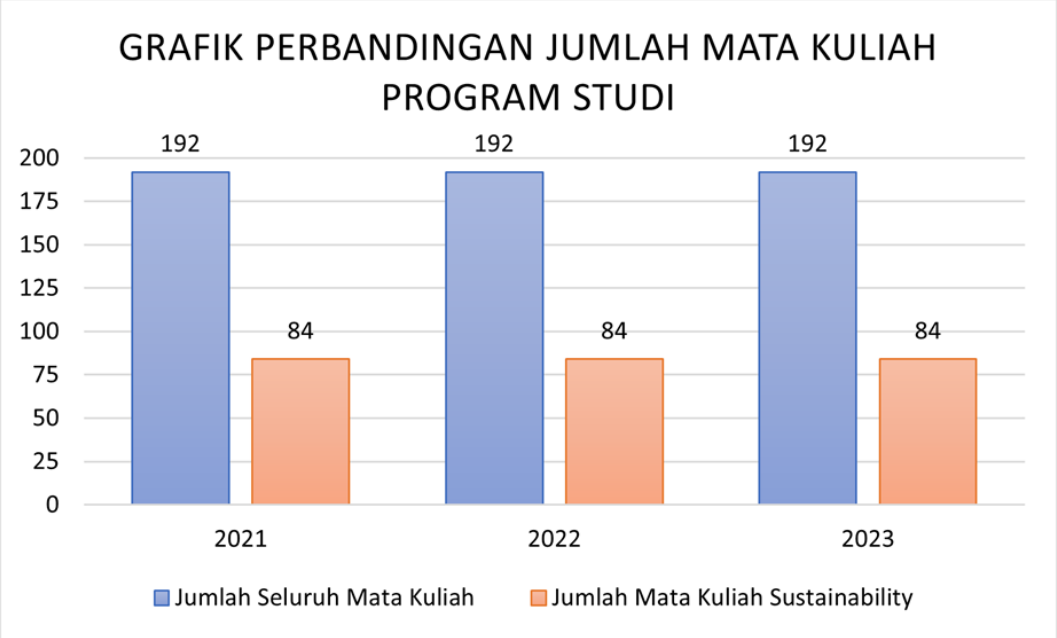
UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.2] Total Number of Courses/Subjects Offered

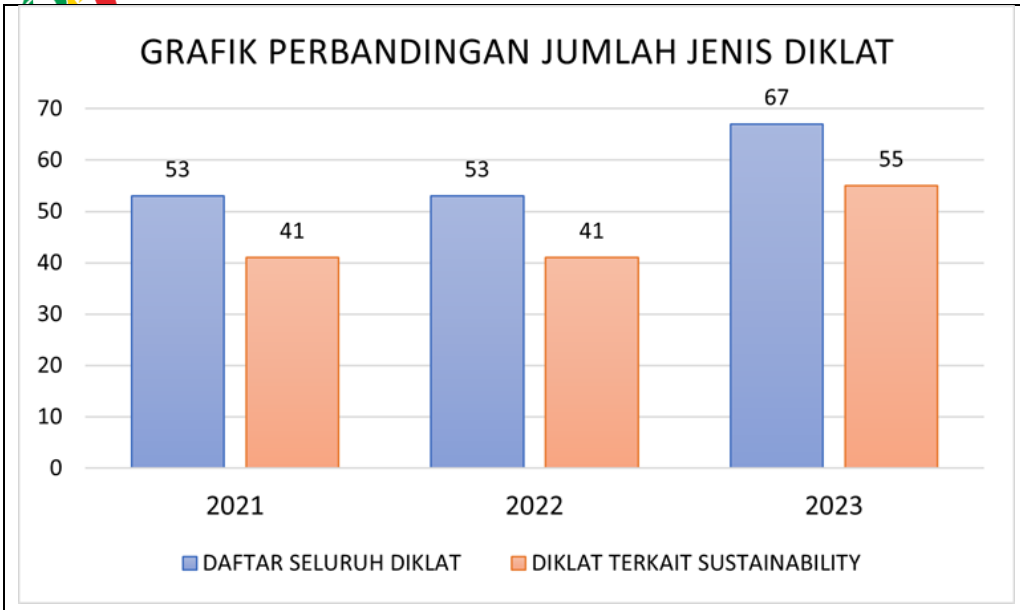
A. GRAPH OF THE NUMBER OF COURSES



Notes :
The curriculum used in the past 3 (three) years period has not undergone any changes, this is because PPI Madiun implemented the 2020 curriculum during that period.

B. GRAPHIC TOTAL EDUCATION AND TRAINING

#1
The main campus of PPI Madiun



The training offered related to sustainability in 2023 has increased compared to previous years.

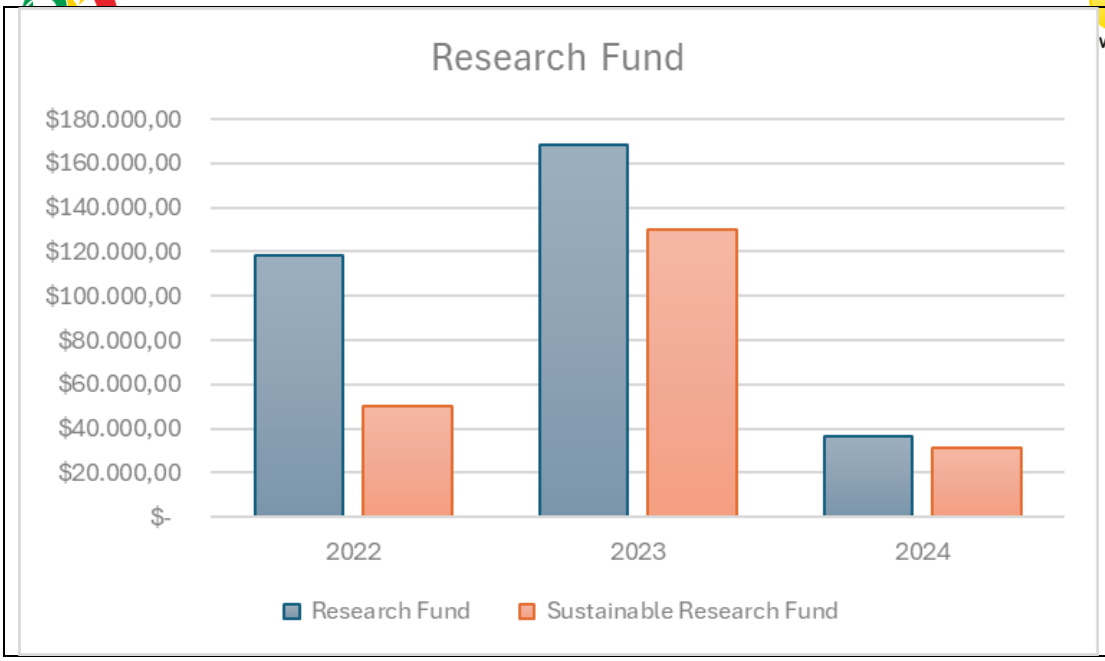
Courses list is available on the additional link:
https://docs.google.com/spreadsheets/d/1QwNNEImWVrxSvw2lZa4WDsl23loGAFjY/edit?usp=sharing&ouid=108785574565876317972&rtpof=true&sd=true

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.4] Total Research Funds Dedicated to Sustainability Research (in US Dollars)



#1
The main campus of PPI Madiun

Description:
PPI Madiun dedicates research funds for sustainability research. Dedication to sustainable research is proven by research results published in national and international journals. Research activities were carried out by lecturers from permanent and non permanent lecturers of PPI Madiun and students from PPI Madiun. Continuous research is carried out not only in the form of tool making but also in the form of literature studies in the field of transportation.

Total research funding for sustainable research in 2022 = 49,966.77 US Dollars
Total research funding for sustainable research in 2023 = 130,015.80 US Dollars
Total research funding for sustainable research in 2024 = 31,019.12 US Dollars
Average three-year research funding for ongoing research = 70,334.12 US Dollars

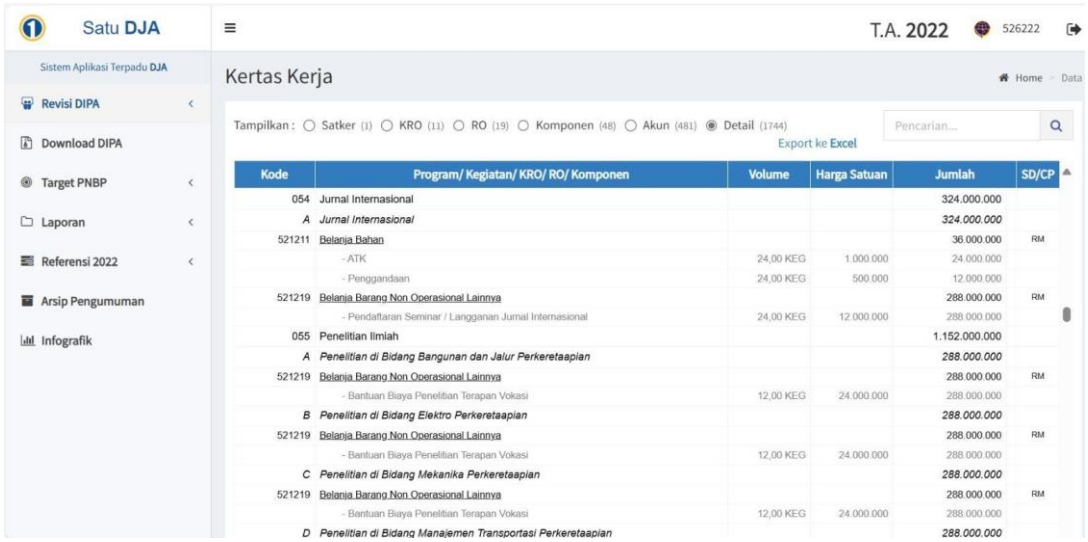
PPI Madiun Profile: https://www.youtube.com/@ppiacid

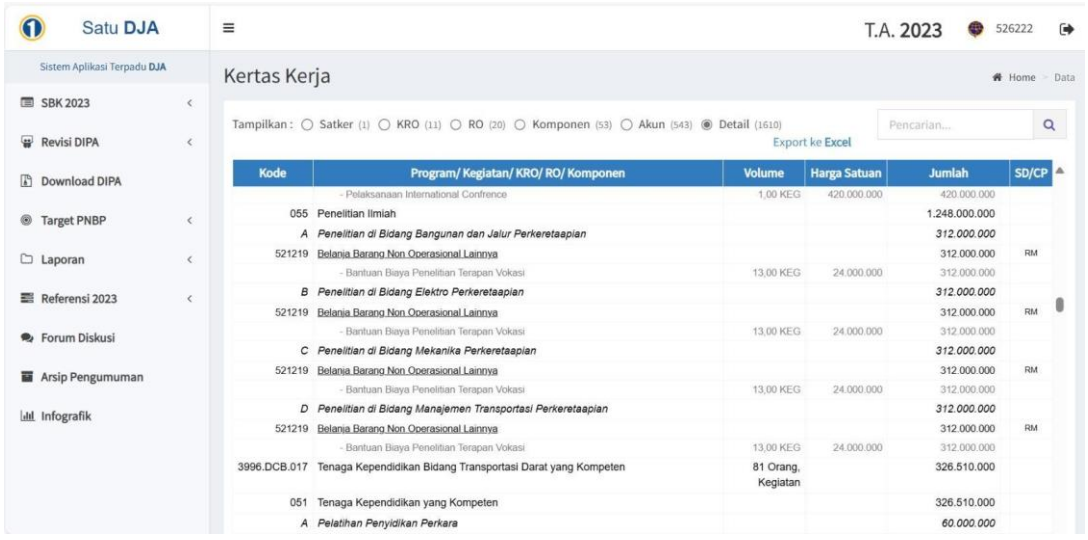
UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

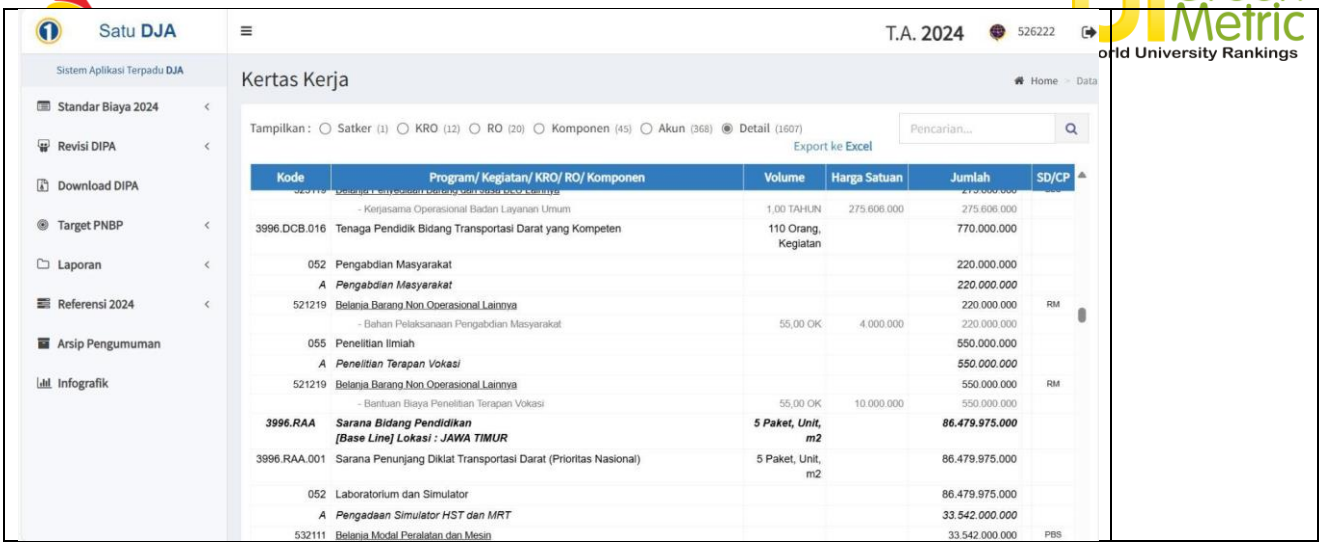
[6] Education and Research (ED)

[6.5] Total Research Funds (in US Dollars)





#1
The main campus of PPI Madiun



Description:

PPI Madiun dedicates research funds for sustainability research. Dedication to sustainable research is proven by research results published in national and international journals. Research activities were carried out by lecturers PPI Madiun involving permanent and non-permanent lecturers at the PPI Madiun and students at PPI Madiun. Continuous research is carried out not only in the form of tool-making but also in the form of literature studies in the field of transportation.

Total research funds in 2022 = 118,216.34 US Dollars
Total research funds in 2023 = 168,091.77 US Dollars
Total research funds in 2024 = 36,168.51 US Dollars

Average three-year research funding for ongoing research = 107,492.2 US Dollars

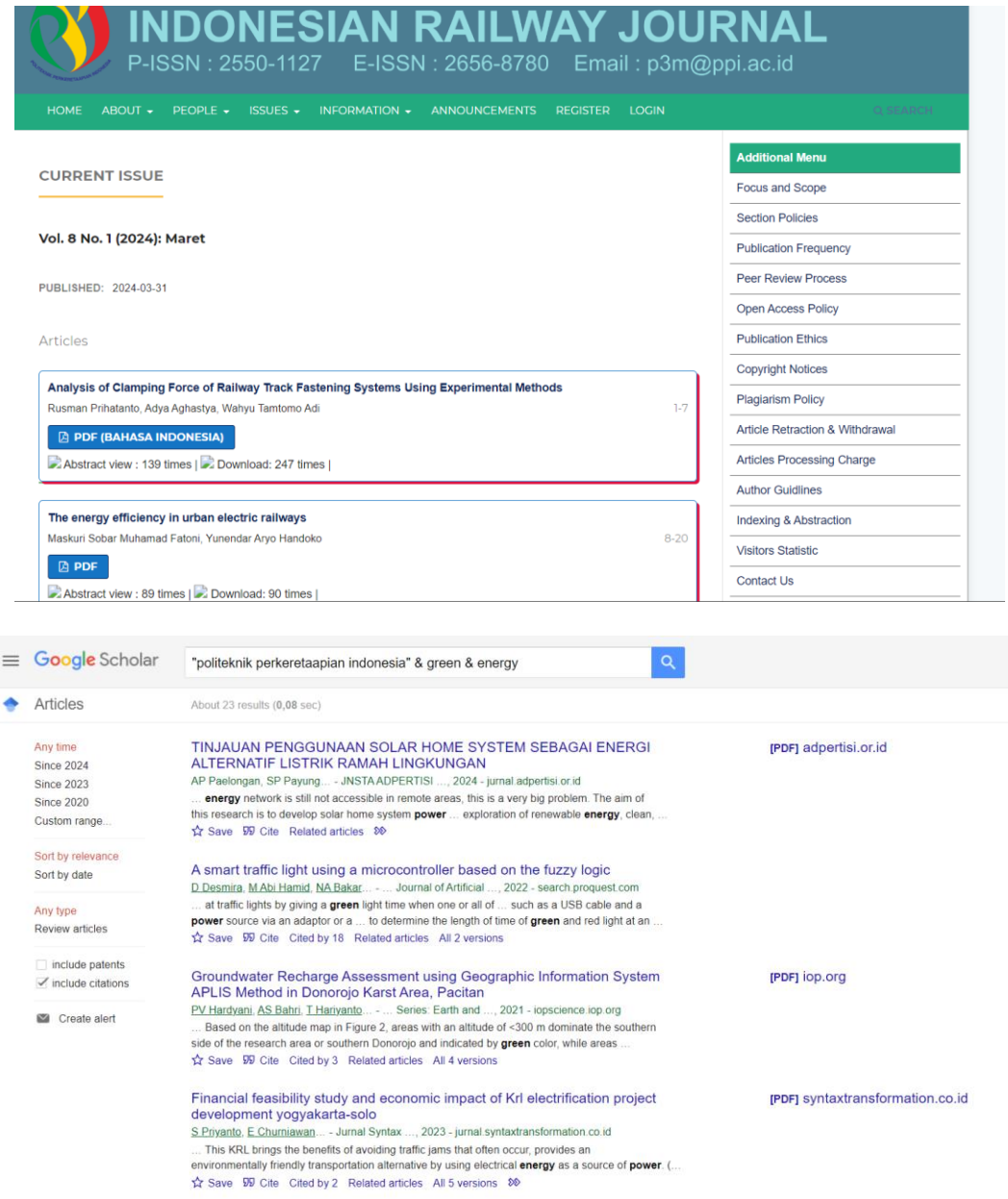
PPI Madiun Profile: https://www.youtube.com/@ppiacid

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.7] Number of scholarly publications on sustainability



#1
The main campus of PPI Madiun

Description:

PPI Madiun annually actively conducts scientific publications related to sustainable transportation. Research conducted by the PPI Madiun includes research aimed at increasing the efficiency of energy use in railway transportation so that it has an impact on reducing emissions on trains. Some of the research that has been done is to design a particulate reducer as an effort to reduce exhaust emissions on inspection trains and analyze the temperature treatment of fuel on exhaust gas capacity and fuel consumption. The research illustrates the efforts of the Indonesian Railway Polytechnic Madiun in order to reduce exhaust emissions. In addition, the PPI Madiun seeks to analyze the efficient use of materials in the construction of projects in railway transportation such as identifying the causes of material waste and analyzing the elemental content and structure of coal waste fly ash. The following are some of the titles of ongoing research at the PPI Madiun over the past three years. These studies are in line with the research roadmap of thePPI Madiun which has a vision to develop environmentally friendly railway transportation.

Nr	Year	Title
1	2022	1. High speed railway operations expert training development in Indonesia 2. Pelatihan Wawancara Kerja Bagi Mahasiswa di Kota Madiun 3. Revealing University Students' Attitudes toward English Language Learning in Indonesian Contexts 4. A smart traffic light using a microcontroller based on the fuzzy logic 5. An Analysis of Passengers' Safety Risk at the Infrastructure Improvement Project of Railway Station 6. Analisis Peralatan Persinyalan Kereta Api dengan Persinyalan Elektrik Silsafe4000 Di Stasiun Lempuyangan Yogyakarta 7. Analysis of Railway Station Development Potential in Madura with Railway Reactivation 8. Design of Micro Hydro Power Plant In Girimulyo Village 9. Efforts To Prevent Work Accidents with Failure Mode and Effect Analysis (FMEA) Method 10. Phenomenology of asset revaluation in the public sector 11. Flipped classroom in online speaking class at Indonesian university context

		12. Information and service challenges in the 5.0 Industrial Revolution on student satisfaction: Empirical analysis in the department of electronics 13. Infrastructure and Built Environment (SIBE-2022)–Challenges on Sustainable and Resilient Infrastructure and Built Environment", 8th-9th March 2022 14. Integrating task and game-based learning into an online TOEFL preparatory course during the COVID-19 outbreak at two Indonesian higher education institutions 15. Kecenderungan Penumpang Menggunakan Moda Kereta Api Antar Kota Dengan Penerapan Protokol Kesehatan Di Era New Normal 16. Pelatihan tune up sepeda motor sebagai peningkatan kompetensi praktikal siswa pada wilayah ulapan (ubud, tegalalang, dan payangan) untuk mendukung kawasan strategis pariwisata nasional (KSPN) 17. Pembuatan situs web penyedia freelancer desain bangunan sipil bagi masyarakat umum 18. Pengaruh pelatihan keselamatan dan kesehatan kerja (K3) terhadap sikap kerja selamat dalam perawatan sarana KA. 19. Penggunaan Solar Tracker untuk Analisis Pencarian Daya Maksimal pada Panel Surya 20. Peramalan Data Real Time Pada Pergeseran Tanah Jalur Kereta Api Menggunakan Metode Fuzzy Time Series 21. Power Flow Analysis Of Dc Train Substation System 22. Railroad Crossings Seen from Indonesia's Positive Law 23. Rancang Bangun Pembangkit Listrik Tenaga Air (PLTA) Skala Kecil Menggunakan Turbin Tipe Crossflow Berbasis Internet of Things 24. Review Design Pembuatan Saluran Sistem Drainase Pada Proyek DDT (Double-Double Track) Lintas Kranji â€"Bekasi Km 25+ 500 SD KM 26+ 600 25. Sosialisasi Peningkatan Keselamatan Perlintasan Sebidang Kepada Para Pegiat Media Sosial Di Tulungagung 26. Studi Komparatif GFDM dan OFDM untuk Sistem Komunikasi Perkeretaapian
2	2023	1. Integrating Task-Based Learning and ICT in Reading and Writing Classes in Hybrid Setting 2. Pursuing Maritime Education in Digital Era: Students' Voices 3. Perencanaan Pembangunan Sarana Sanitasi Kerjasama Dengan Kampung Cihikeu Wetan, Cianjur 4. The Influence of Service Quality and Timeliness on Passenger Loyalty, Yogyakarta International Airport Train 5. A new geometric planning approach for railroads based on satellite imagery 6. Aliran Daya Aktif dan Efisiensi Vertical Axis Wind Turbine (VAWT) secara Stand Alone System 7. Analisis Pembangunan Zona Lalu Lintas dengan Standard Deviation Control Kepadatan Area Terbangun Studi Kasus: Kabupaten Klungkung, Provinsi Bali 8. Analysis Of Noise Intensity In The Railway Facility Maintenance Work Environment 9. Analysis Of The Influence Of Organizational Commitment And Job Satisfaction On Turn Over Intention In Hospitality Industry 10. Analysis of Train Travel Patterns Case Study of Bogor Double Track Construction-Sukabumi 11. Desain Alat Pengisi Minyak Pelumas Kompresor Pada Lokomotif 12. Enhancing students' learning outcomes through MALL in TOEFL preparation class for railway mechanical technology 13. Financial feasibility study and economic impact of Krl electrification project development yogyakarta-solo 14. Fostering Self-Assessment in English Learning with a Generative AI Platform: A Case of Quizizz AI. 15. Game-based Learning in TOEFL Preparatory Course

		16. Geoelectric survey for reactivation planning from Madiun-Slahung railway track in Indonesia 17. High speed railway operations expert training development in Indonesia 18. Implementation Of The Minimum Service Standard Policy For Transportation Of People By Train On The Yogyakarta-Solo Electric Rail Train 19. Juridical Review of Minimum Service Standards at Manggarai Station 20. Kajian Anjlokan Kereta Api Pada Lintas Rangkasbitung-Tanah Abang Berdasarkan Track Quality Index (TQI) 21. Menstimulasi Minat Dan Inovasi Siswa Smk Di Bidang Teknologi Perkeretaapian Melalui Studi Lapangan 22. Optimalisasi Jumlah Perjalanan Krl Lintas Jakarta Kota-Bogor Terhadap Demand Penumpang Menggunakan Arima Box-Jenkins 23. Pelatihan Implementasi Kurikulum Merdeka pada Raudatul Athfal dan Madrasah Ibtidaiah di Pontianak Utara 24. Pemanfaatan Teknologi Computer Vision Untuk Implementasi Deteksi Masker Menggunakan Metode Supervised Learning 25. Pembuatan Sistem Grounding Axle Counter Berdasarkan Tahanan Jenis Tanah dan Kedalaman Grounding 26. Pemetaan Pola Persebaran Kecelakaan Pada Perlintasan Sebidang Di Jawa Timur Dengan Gis 27. Pendampingan Implementasi Open-Power Net Software 28. Penerapan Internet of Things Untuk Rancang Bangun Pengukuran Tingkat Kebisingan pada Sarana Perkeretaapian 29. Pengenalan Sistem Pengisian Baterai Nirkabel Dengan Induksi Elektromagnet Pada Bengkel-Bengkel Listrik Dan Elektronika 30. Perbandingan Realisasi Biaya Pelaksanaan Terhadap RAB Berbasis BIM 5D Pada Pekerjaan Struktural Bangunan (Comparison Of Implementation Cost Realization Against 5D BIM-based Cost Budget Plan on Structural Building Works) 31. Perencanaan Pembangunan Sarana Sanitasi Kerjasama Dengan Kampung Cihikeu Wetan, Cianjur 32. Precautions For Jakarta-Bandung High-Speed Rail Infrastructure Project Cooperation: Construction At Night And In Storm 33. Probing the Needs of Injecting Technical Communication in English Module in Indonesia Railways Polytechnic: A Students' Perspectives 34. Prototype of Making Endpost Rail Joint on Railroads Made of CFRP (Carbon Fiber Reinforcement Plastic) 35. Realtime And Centralized Solar Panel Online Monitoring System Design Using Thingspeak 36. The Effectiveness of SOLE on EFL Learning for Vocational Students in Indonesia 37. The effectiveness of using Quillbot in improving writing for students of English Education Study Program 38. The Influence Of E-Customer Satisfaction, E-Service Quality And Sales Promotion On E-Customer Loyalty Of Tokopedia Customers 39. The Influence Of Job Satisfaction, Career Development And Teamwork On Employee Retention In Government-Owned Cultural Destinations 40. The Relationship of The Implementation of Warta DNAS O/153 with The Performance of Operations Officers 41. Upaya Meningkatkan Peran Dan Nilai Strategis Msdm Guna Menunjang Daya Saing Organisasi, Perspektif: Competence Dan Talent.
3	2024	1. Emisi Gas Rumah Kaca Pada Pembangunan Jembatan Bh314a Menggunakan Metode Intergovermental Panel On Climate Change 2. Ability To Pay (ATP) and Willingness To Pay (WTP) Jakarta Mass Rapid Transit 3. Analisis Beban Pendinginan Pada Kereta TMC PPI Madiun

4. Analisis Keekonomian Pembangunan Pembangkit Listrik Tenaga Surya (PLTS) Atap pada Stasiun Yogyakarta
5. Analisis Kuat Jepit (Clamping Force) Sistem Penambat Rel Kereta Api Dengan Metode Eksperimen
6. Analysis of Mode Integration Facilities at Madiun Station
7. Analysis Of The Influence Of Spiritual Capital, Motivation And Work Competencies On Performance Of Human Resource In Smes Sector
8. Analyzing Hybrid Systems for Railway Crossing Energy Generation
9. Artificial Intelligence in Regenerative Braking for Trains: A Systematic Review
10. Collapse Behavior and Energy Absorption Characteristics of Design Multi-Cell Thin Wall Structure 3D-Printed Under Quasi Statistic Loads
11. Design of Testing E-Form and Reminder of Calibration Schedule for Operation Facility Testing Equipment
12. Double Track Railway Planning of Terminal Petikemas Surabaya-Surabaya Pasar Turi
13. Evaluating the Google English Speaking and Pronunciation Practice Tool
14. Evaluation Of Remaining Materials For Railway Construction Project
15. Exploring Innovative Strategies for Sustainable Organizational Growth
16. Feature Selection In Support Vector Machine And Random Forest Algorithms For The Classification Of Recipients Of The Smart Indonesia Program
17. Geometric Evaluation of Highways and Railroads on Safety at Crossings (Case Study of JPL 136 and JPL 138 Madiun City)
18. Impact of mission and vision on academic services mediated by governance and human resources in higher education institutions of Indonesia
19. Inventarisasi Kepadatan Perlintasan Sebidang Kereta Api Berdasarkan Warna Peta Jalan pada Aplikasi Google Maps di Kota Madiun”
20. Kajian Pemanfaatan Aset Ruang Tunggu Ka Feeder di Stasiun Bandung dalam Rangka Peningkatan Pendapatan Non-Farebox
21. Magang MBKM Sebagai Sarana Meningkatkan Adaptabilitas Karir Mahasiswa Teknik Mesin
22. Pelatihan Penulisan Artikel Ilmiah Terindeks Scopus Berbantu Aplikasi Mendeley
23. Pembelajaran Berbasis Game: Pelatihan Membuat Media Pembelajaran Menarik Dengan Teknologi
24. Penerapan Teknologi Augmented Reality Dalam Menyajikan Materi Pembelajaran Untuk Meningkatkan Minat Belajar Siswa
25. Pengaruh Jumlah Penumpang dan Durasi Buka Tutup Pintu Terhadap Perubahan Suhu (Studi Kasus: Kereta Inspeksi PPI Madiun)
26. Pengaruh Kewirausahaan Dalam Meningkatkan Kualitas Pelayanan Keperawatan: Analisis Pengalaman Praktisi Bisnis Keperawatan
27. Pengembangan Sistem Pengenalan Wajah Berbasis Deep Learning Untuk Keamanan Komputer
28. Penggunaan Aplikasi Turnitin Dan Chat Gpt Dalam Penyusunan Karya Ilmiah Terindeks Scopus
29. Peran Internet Of Things (IOT) Dalam Transformasi Pendidikan
30. Perencanaan konseptual dan perhitungan kuantitas bangunan institusi pendidikan untuk peningkatan demand stasiun jombang dengan menggunakan autodesk revit
31. Ragam Bahasa Teknik Tenaga Perawatan dan Pemeriksaan Sarana Perkeretaapian di Wilayah Kerja Daop 7 Madiun
32. Risk Management of Box Culvert Construction Work at Bh 1149 Cross Cirebon-Kroya with Failure Mode and Effect Analysis and Fault Tree Analysis Method
33. Selection of The Cirebon-Semarang High Speed Railway Phase I (Cirebon-Brebes) Using Arcgis 10.8
34. Simulasi Pemanfaatan Aplikasi Sistem Deteksi Pengguna Masker Pada Ruangan Laboratorium

		35. Students' Perception In Pursuing Maritime Higher Education In Digital Era 36. Studi biaya kecelakaan di perlintasan sebidang berpalang pintu dan tanpa palang pintu di jawa timur 37. Tantangan dan Peluang Pengoperasian Kereta Api Cepat dalam Mewujudkan Sistem Transportasi Maju di 38. Tantangan dan Peluang Pengoperasian Kereta Api Cepat dalam Mewujudkan Sistem Transportasi Maju di Indonesia 39. Teknologi energi baru terbarukan dan konservasi energi: pemberdayaan lahan dengan sistem ketahanan pangan terpadu terbarukan “SAPTA” 40. The Ability to Pay and Willingness to Pay for LRT Bandung Raya Planning Babakansiliwangi Leuwipanjang 41. The Effect of Fiber Content on Long-Term Compression Behavior of Tropical Fibrous Peat 42. The efisiensi energi pada perkeretaapian listrik perkotaan 43. The influence of train noise in residential areas (case study in a residential area near railways in winongo district 44. The Influence of Training and Competency Development on Employee Performance at the Manpower and Transmigration Service of Musi Banyuasin Regency 45. Tinjauan Penggunaan Solar Home System Sebagai Energi Alternatif Listrik Ramah Lingkungan 46. Use of the Internet of Things (IoT) in the Context of Ubiquitous Learning in Higher Education 47. Wawasan Pendidikan: Teori dan Konsep Pengelolaan Pendidikan 48. Wayside Wifi-Repeater as a Railway Operation Facility for Optimizing Traffic Density Detection Cameras at Level Crossings

The number of publications of sustainable scientific papers in 2022-2024 averages 38 publications per year.

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.8] Number of events related to sustainability (environment)

1. Tree planting activities to commemorate World Tree Day	
 	#1 The main campus of PPI Madiun

Description:
In the framework of World Tree Day, the PPI Madiun held a tree planting event around the campus environment by cadets and academics. The tree planting activity was an effort to increase awareness of the importance of trees for the environment and human life as well as to build a commitment to environmental conservation.
2022: 1 activity
Year 2023: 1 activity
Year 2024: 1 activity

2. Employee Volunteering	
 	#1 The main campus of PPI Madiun

Description:
Employee Volunteering activities held by the Madiun branch of BPJL Employment and PPI Madiun with the theme "A Healthy Environment Has a Strong Spirit." This activity aims to increase awareness of the importance of protecting the environment and encourage active involvement in nature conservation. In this event, participants distributed plant seeds consisting of various types of trees and ornamental plants, which were then planted together in the campus area to increase greening. Apart from that, this activity also includes the

distribution of separate waste bins, which aims to encourage waste sorting and better waste management. Through this activity, it is hoped that a cleaner and healthier environment can be created, as well as building a spirit of mutual cooperation among the academic community and cadets, thereby creating a strong spirit in protecting and preserving the surrounding environment.
Year 2022: - activities
Year 2023: 1 activity
Year 2024: - activities

3. Employee Routine Community Service	
 	#1 The main campus of PPI Madiun

Description:
Community service activities by PPI Madiun academic community are carried out regularly every month as a form of shared commitment to maintaining the cleanliness and beauty of the campus environment. In this activity, leaders, cadets, lecturers and staff work together to clean the area around campus, including parks, courtyards and public facilities. This activity does not only focus on physical cleanliness, but also aims to build a sense of concern and shared responsibility for the environment. This community service is a moment to strengthen ties between the academic community, creating a more harmonious and comfortable campus atmosphere. With a collaborative spirit, each individual contributes to creating a clean and healthy environment, as well as raising awareness of the importance of maintaining cleanliness as part of everyday life.
2022: 12 activities
2023: 12 activities
2024: 12 activities

4. Garden and Rail Track Cleaning	
 	#1 The main campus of PPI Madiun

Description:
The activity of cleaning gardens and practice rail tracks by cadets and academics at PPI Madiun is an important initiative to maintain the cleanliness and safety of practice areas. In this activity, cadets and the academic

community work collaboratively to clean gardens and railroad tracks from rubbish, weeds and other materials that could interfere with practical activities. This activity not only serves to create a clean and safe environment, but also provides direct experience to cadets about the importance of maintaining a work environment. It can foster a sense of responsibility for the facilities used. With the spirit of mutual cooperation, they are committed to maintaining cleanliness and comfort, in order to support optimal teaching and learning processes.
2022: 1 activity
Year 2023: 1 activity
Year 2024: 1 activity

5. Making Biopores	
	#1 The main campus of PPI Madiun

Description:
The activity of making biopores at PPI Madiun was carried out as an effort to improve the quality of organic waste management and support the sustainability of the campus environment. This activity is a labor-intensive activity which aims to open up employment opportunities for the community. The aim of making biopores is to process organic waste into compost naturally, as well as increase the soil's water absorption capacity, which can prevent puddles and reduce the risk of flooding. Through this activity, it is hoped that it can raise awareness of the importance of protecting the ecosystem, as well as build a sense of responsibility towards the environment among students.
Year 2022: - activities
Year 2023: - activities
Year 2024: 1 activity

6. DWP Garden and DWP Nursery	
	#1 The main campus of PPI Madiun

Description:
DWP's (*Dharma Wanita Persatuan)* activities in creating the DWP Garden and DWP Nursery are an effort to support environmental preservation while improving the quality of green open spaces around campus. In this activity, DWP members actively participated in designing and planting various types of ornamental plants and vegetables in the gardens that had been prepared. The DWP Garden functions as an educational area and green area for plant management by Dharma Wanita PBB, while the DWP Nursery provides plant seeds which in the

future will encourage the greening of the environment around the campus. Through this activity, it is hoped that it can foster a sense of love for plants and the environment, as well as strengthen social ties between members. This activity is also a forum for sharing knowledge about plant care, so as to increase awareness of the importance of sustainability and nature conservation.
2022: 4 activities
2023: 4 activities
2024: 4 activities

7. Scientific Oration	
 	#1 The main campus of PPI Madiun

Description:
The scientific oration delivered at every graduation at PPI Madiun is an important moment which is the highlight of the event for the graduates. In this oration, the speaker, who is usually a leading academic figure or practitioner, conveys thoughts and views regarding current issues in the field of railways and technology, as well as the importance of graduates' contributions to nation building. This oration not only inspired the graduates to apply the knowledge they had gained, but also encouraged them to think critically and innovatively in facing challenges in the world of work. This scientific oration is an opportunity for reflection for graduates about their educational journey and hopes for the future, creating an atmosphere full of emotion and enthusiasm. Through this activity, it is hoped that graduates can leave the graduation ceremony with strong motivation and determination to contribute positively to society and industry.
2022: 1 activity
Year 2023: 1 activity
Year 2024: 1 activity

8. Socialization of Electricity Use	
 	#1 The main campus of PPI Madiun

Description:
PPI Madiun is carrying out socialization on the use of electricity as an energy saving effort with the aim of increasing awareness of the academic community and cadets regarding the importance of energy efficiency. In this event, participants, consisting of cadets and employees, were given education regarding the efforts that must be made to create a more energy efficient campus environment. Through this activity, participants are encouraged to implement simple but effective steps in their daily lives, so as to reduce costs and environmental

impacts. It is hoped that the implementation of this outreach can create a culture of energy saving on campus, as well as make a positive contribution to environmental sustainability.
2022: 1 activity
Year 2023: - activities
Year 2024: - activities

9. Socialization of the use of public transportation during business trips	
 	#1 The main campus of PPI Madiun

Description:
The director's socialization of the use of public transportation during business trips to all employees at PPI Madiun aims to encourage awareness of the importance of choosing environmentally friendly and efficient modes of transportation. In this outreach session, the director explained the benefits of using public transportation, such as reducing congestion, reducing carbon emissions, and efficiency in business travel costs. Through this outreach, employees are invited to discuss the various options available for official travel. It is hoped that this activity will not only change employees' mindset towards transportation, but also build a collective commitment to creating a cleaner and more sustainable environment. With this outreach, it is hoped that all employees can more actively participate in efforts to reduce carbon emissions.
Year 2022: - activities
Year 2023: 1 activity
Year 2024: - activities

10. Practical Training on Energy Saving Electrical Installations	
 	#1 The main campus of PPI Madiun

Description:
The community service training program, Practical Energy Saving Electrical Installation Training, aims to provide knowledge and skills to participants in installing efficient and environmentally friendly electrical systems. In this training, participants will be involved in in-depth theoretical and practical sessions, including an understanding of energy-saving electrical components, installation techniques, and how to optimize energy use. By prioritizing the concept of sustainability, this program is expected to make a significant contribution to society in reducing energy consumption and electricity costs, while increasing awareness of the importance of energy efficiency.
2022: 12 activities

2023: 20 activities
2024: 12 activities

11. Heavy Equipment Education and Training	
 	#1 The main campus of PPI Madiun

Description:
Heavy Equipment Education and Training plays an important role in creating environmental sustainability by educating operators about the efficient and environmentally friendly use of heavy equipment. Through this training, participants are taught operating techniques that reduce emissions and negative impacts on the environment, as well as the importance of equipment maintenance to maximize service life and energy efficiency. By integrating best practices in heavy equipment operation and maintenance, this program aims to support sustainable infrastructure development and minimize the ecological footprint, thereby contributing to efforts to maintain environmental balance.
2022: 12 activities
2023: 20 activities
2024: 12 activities

12. Hospitality Training	
 	#1 The main campus of PPI Madiun

Description:
Education and training in the hospitality sector focuses on implementing sustainable practices that support environmental sustainability in the service industry. Through this program, participants are taught about efficient resource management, such as waste reduction, use of renewable energy, and wise water management. In addition, this training emphasizes the importance of integrating local culture and sustainability in services, thereby supporting the local economy and maintaining the authenticity of the environment. By raising awareness of ecological responsibility, this educational program contributes to the creation of a more responsible and sustainable hospitality industry.
Year 2022: - activities

Year 2023: 1 activity
Year 2024: 1 activity

13. One Employee One Tree Movement	
 	#1 The main campus of PPI Madiun

Description:
The One Employee One Tree Movement at PPI Madiun is an initiative that supports environmental sustainability by caring for one tree for each employee. This program aims to increase awareness of the importance of reforestation and the role of trees in absorbing carbon dioxide and maintaining ecosystem balance. By involving the entire academic community, this movement not only contributes to reducing the impact of climate change, but also creates green spaces that can be used as learning and recreation areas. In addition, this program strengthens the polytechnic's commitment to environmental conservation and supports sustainable development goals
Year 2022: - activities
Year 2023: 1 activity
Year 2024: - activities

14. Increasing awareness of young children regarding safety at level crossings	
 	#1 The main campus of PPI Madiun

Description:
Increasing awareness of early childhood regarding safety at level crossings focuses on education that supports environmental sustainability by emphasizing the importance of safety and protection of transportation infrastructure. This program teaches children about the risks associated with train crossings, as well as safe ways to interact with their surroundings. By building awareness from an early age, it is hoped that children can become agents of change who care about safety and the environment, and contribute to reducing accidents. This initiative also supports efforts to create safer and more sustainable communities in the future.
2022: 12 activities
2023: 12 activities
2024: 12 activities

15. Increasing awareness of elementary school students regarding safety at level crossings	
 	#1 The main campus of PPI Madiun

Description:
Increasing awareness of elementary school students regarding safety at level crossings is a strategic step that supports environmental sustainability and transportation safety. Through this educational program, students are taught about the risks associated with train crossings, as well as the importance of complying with safety rules to avoid accidents. Apart from that, this program instills the values of environmental responsibility, such as the need to maintain the cleanliness and safety of areas around crossings. By equipping children with knowledge and awareness, it is hoped that they can contribute to safer communities, and become agents of change who care about safety and the environment in the future.
2022: 12 activities
2023: 12 activities
2024: 12 activities

16. Increasing awareness of junior high school students regarding safety at level crossings	
 	#1 The main campus of PPI Madiun

Description:
Increasing awareness of junior high school students regarding safety at level crossings is very important in the context of environmental sustainability and transportation safety. This program aims to provide an in-depth understanding of the risks faced when interacting with train crossings, as well as how safe actions can reduce accidents. In addition, students are taught about the negative impacts of accidents on the environment, including pollution and damage to ecosystems. By equipping them with knowledge and an attitude of responsibility, it is hoped that students can play an active role in creating a safer and more sustainable environment, as well as becoming safety ambassadors for their friends and communities.
2022: 6 activities
2023: 6 activities
2024: 6 activities

17. Increased Awareness of High School Students Regarding Safety at Level Crossings	
 	#1 The main campus of PPI Madiun

Description:
Increasing awareness of high school students regarding safety at level crossings plays a crucial role in supporting environmental sustainability and transportation safety. Through this program, students are given an in-depth understanding of the consequences of accidents at train crossings, including their impact on ecosystems and society. Additionally, they are taught to analyze and promote safety practices that not only protect themselves, but also protect the surrounding environment. By involving students in awareness campaigns, it is hoped that they can become active agents of change, spreading knowledge about safety and the need to maintain a balance between infrastructure development and environmental sustainability in their communities.
2022: 6 activities
2023: 6 activities
2024: 6 activities

18. Education and Training of Railway Facility Examiners and Assistant Examiners	
 	#1 The main campus of PPI Madiun

Description:
Education and Training for Railway Facilities Testers and Assistant Testers focuses on developing skills that support environmental sustainability through testing and evaluating efficient and safe means of transportation. This program teaches participants about testing techniques that prioritize environmental standards, including emissions and energy efficiency, thereby ensuring that rolling stock operates with minimal environmental impact. By preparing a competent test workforce, this initiative contributes to improving safety and sustainability in the transportation sector, while encouraging the use of more environmentally friendly modes of transportation, such as trains, which can reduce the carbon footprint compared to motorized vehicles.
2022: 1 activity
Year 2023: - activities
Year 2024: 1 activity

19. Education and Training of Railway Infrastructure Examiners and Assistant Examiners	
 	#1 The main campus of PPI Madiun

Description:
Education and Training for Railway Infrastructure Examiners and Assistant Examiners has an important role in supporting environmental sustainability through monitoring and evaluating transportation infrastructure. This program provides participants with knowledge of safety and sustainability standards, including techniques for minimizing the environmental impact of building and maintaining rail infrastructure. With a focus on the use of environmentally friendly materials and efficient resource management, this training aims to ensure that railway infrastructure is not only safe but also contributes to reducing carbon emissions. Thus, this initiative supports the creation of a sustainable and environmentally friendly transportation system, and contributes to the development of better communities.
2022: 1 activity
Year 2023: - activities
Year 2024: 1 activity

20. Education and Training of Railway Infrastructure Inspectors and Nurses	
 	#1 The main campus of PPI Madiun

Description:
Education and Training for Railway Infrastructure Inspectors and Maintainers contributes to environmental sustainability by emphasizing the importance of maintaining efficient and environmentally friendly infrastructure. This program equips participants with the skills to carry out proper inspection and maintenance of infrastructure, ensuring that all infrastructure elements function optimally without causing damage to the surrounding ecosystem. With a focus on best practices, such as the use of sustainable materials and low-impact maintenance techniques, the training aims to reduce the ecological footprint of railway operations. Thus, this initiative not only improves transportation safety, but also plays a role in preserving the environment for future generations.

2022: 19 activities
2023: 9 activities
2024: 15 activities

21. Transportation Sector Environmental Technical Coordination Meeting	
 	#1 The main campus of PPI Madiun

Description:
Transportation Sector Environmental Technical Coordination Meeting with the aim of supporting environmental sustainability. In this meeting, policies and implementation of preventing environmental impacts in transportation activities, low-carbon and climate-resilient development planning strategies, which play an important role in mitigating climate change and controlling greenhouse gas (GHG) emissions, were discussed. Energy sector policies are also in the spotlight, especially in supporting environmentally friendly transportation. Teluk Lamong Terminal is a clear example, by implementing wastewater treatment from operational activities for reuse, thereby reducing pollution and maximizing resource efficiency. This initiative reflects a commitment to creating a sustainable and environmentally friendly transportation system, as well as achieving the target of national contribution to climate change.
Year 2022: - activities
Year 2023: - activities
Year 2024: 1 activity

22. ICORT	
 	#1 The main campus of PPI Madiun

Description:
The International Conference on Railway and Transportation (ICORT) is an important forum that brings together international experts, researchers and practitioners to discuss the latest innovations and developments in the field of railways and transportation. These activities usually include a series of presentations, discussion panels and workshops covering various topics, from the latest technology in transportation systems to infrastructure

development policies and strategies. ICORT aims to strengthen international collaboration and knowledge sharing in order to improve the efficiency and sustainability of the global transportation system. With participation from various stakeholders, this conference is not only an opportunity to introduce the latest research, but also to network and expand insight into the challenges and opportunities in the future transportation industry.
2022: 1
2023: 1
2024: -

Environment and sustainability related events hosted or organized by the University in the 2022-2024 academic year.
Total number of sustainability/environment related events in:
2022: 102
2023: 109
2024: 99
A total average per annum over the last 3 years of **103 events**

Some pictures of sustainability events are available on the additional link:
https://drive.google.com/drive/folders/1XR5gxr2vUvNUqACTOAgffTehhNrV49eK

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.5] Number of activities organized by student organizations related to sustainability per year

1. Dormitory Environmental Cleaning Activities by the Cadet Corps Battalion	
 	#1 The main campus of PPI Madiun

Description:
Dormitory Environmental Cleaning Activities by the Cadet Corps Battalion contribute significantly to environmental sustainability by increasing awareness of the importance of maintaining cleanliness and preserving the ecosystem. Through this collective action, the cadets not only cleaned the area around the dormitory, but also instilled the values of environmental responsibility in themselves. This activity helps reduce waste and pollution, as well as creating a healthier and more comfortable environment to live in. By involving cadets in environmental activities, it is hoped that they can build a culture of sustainable environmental care, so that they become agents of positive change in their communities in the future. Clean-up activities by cadet corps battalions are carried out 24 times a year

2. Tree planting activities in the campus environment by the Cadet Corps Battalion	
 	#1 The main campus of PPI Madiun

Description:
The Tree Planting activity in the Campus Environment by the Cadet Corps Battalion is a strategic step in supporting environmental sustainability. Through this action, the cadets not only contribute to greening the

campus, but also play a role in mitigating climate change by increasing carbon dioxide absorption. Planting trees helps improve air quality, maintain biodiversity, and create comfortable open spaces for academic and social activities. Apart from that, this activity also educates cadets about the importance of protecting the environment and responsibility towards nature, so that they can become active agents of change in encouraging environmental awareness in society. Thus, these activities not only provide short-term benefits, but also contribute to a more sustainable future.

3. Scientific Writing Competition	
 	#1 The main campus of PPI Madiun

Description:

The Scientific Writing Competition activity by cadets with the theme "Implications of the Application of Technology and Transportation on the Environment, Equity and Sustainability" serves as a forum to explore and educate about the relationship between technological innovation in the transportation sector and its impact on the environment. Through this competition, cadets are encouraged to conduct in-depth research, explore innovative solutions that can minimize the negative impact of transportation on the ecosystem, and evaluate how technology can improve accessibility and social justice. By emphasizing the importance of sustainability, this activity not only increases participants' awareness of environmental issues, but also encourages them to think critically about how technological solutions can be applied to create a more environmentally friendly and sustainable transportation system. It is hoped that the results of this competition can make a real contribution to more sustainable transportation policies in the future.

4. Socialization activities for Daop 10 PPI Madiun Team regarding Security at JPL	
 	#1 The main campus of PPI Madiun

Description:

The PPI Madiun Daop 10 Team's socialization activities regarding Safety at JPL (Crossing Routes) focus on increasing awareness of safety and environmental sustainability in transportation operations. In this outreach, participants were given information about the importance of maintaining safety on train crossings, which has a direct impact on reducing the risk of accidents and environmental pollution. The Daop 10 PPI Madiun Team explains the preventative steps that must be taken to protect the surrounding ecosystem and how good security practices can reduce negative impacts on society and the environment. By building collective awareness about safety at JPL, this activity contributes to the creation of a more sustainable and safe transportation system, and strengthens our shared commitment to environmental protection.

5. Practical Environmental Cleaning Activities by the Daop 10 PPI Madiun Team	
 	#1 The main campus of PPI Madiun

Description:
Practical Environmental Cleaning Activities (railway) by the Daop 10 PPI Madiun Team focuses on maintaining the cleanliness and preservation of the ecosystem around the railway line. In this activity, the team cleans up rubbish and waste that can disturb the environment and potential safety, such as blocking water flow and destroying habitats. With this action, the team not only created a safer and more comfortable environment, but also increased awareness of the importance of maintaining cleanliness in public areas. This activity is part of a larger effort to support environmental sustainability, encourage good practices in communities, and strengthen the link between safe transportation and nature protection. Cleaning activities are carried out 12 times a year

6. Health Webinar Activities	
 	#1 The main campus of PPI Madiun

Description:
Health Webinar activities held by cadets play an important role in promoting environmental sustainability by educating participants about the relationship between human health and environmental conditions. In this event, cadets discussed issues such as the impact of pollution, the importance of air quality, and access to clean natural resources. By providing insight into healthy living practices that are also environmentally friendly, such

as sustainable eating patterns and reducing waste, this activity aims to encourage participants to become more aware of their role in protecting the ecosystem. This initiative invites young people to contribute to the health of the environment and society, creating a sustainable positive impact for the future.

7. Volleyball Sparing Activity by the PPI Madiun Cadet Volleyball Team	
 	#1 The main campus of PPI Madiun

Description:
The volleyball sparring activity held by the PPI Madiun Cadet Volleyball Team is an event that not only hones athletic skills, but also builds team unity and spirit. In this match, cadets have the opportunity to train intensively and compete with other teams, so they can improve their game strategy and physical endurance. Apart from that, this activity also functions as a means to strengthen relationships between team members and increase the sense of solidarity between them. With high sports enthusiasm, this sparring is an important moment for cadets to channel their talents and create a positive atmosphere in the campus environment. Volleyball sparring activities are held 12 times a year

8. Basketball Sparing Activity by the PPI Madiun Cadet Basketball Team	
 	#1 The main campus of PPI Madiun

Description:
The basketball sparring activity held by the PPI Madiun Cadet Basketball Team is a valuable opportunity to improve playing skills and build solidarity between team members. In this match, cadets not only practice game techniques and strategies, but also support each other in creating a healthy competitive atmosphere. This sparring helps hone physical and mental endurance, as well as strengthen cooperation in the field. Apart from that, this activity also serves as an opportunity to strengthen friendship and solidarity among team members, creating stronger bonds and a spirit of togetherness that will contribute positively to the team's future achievements. Basketball sparring activities are held 12 times a year

9. Futsal Sparing Activity by the PPI Madiun Cadet Futsal Team	
 	#1 The main campus of PPI Madiun

Description:
The futsal sparring activity held by the PPI Madiun Taruna Futsal Team is an important event to hone the team members' playing skills and strategies. In this competition, the cadets competed with high enthusiasm, taking advantage of the opportunity to improve teamwork and communication on the field. This activity also functions as a means to build a sense of solidarity and friendship among team members. With an atmosphere full of enthusiasm, futsal sparring not only improves physical fitness, but also strengthens bonds between cadets, creating a positive atmosphere that supports the team's future development. Futsal sparring activities are held 12 times a year

10. Sharing Knowledge between the Daop 10 PPI Madiun Team and the Pecel +63 Railfans Community	
 	#1 The main campus of PPI Madiun

Description:
The Knowledge Sharing activity between the Daop 10 PPI Madiun Team and the Pecel +63 Railfans Community regarding railways is an initiative aimed at increasing understanding and appreciation of the world of railways. In this event, team members and the community discussed various aspects of railways, from the latest technology, safety, to the social and environmental impacts of train transportation. This exchange of information not only enriches the participants' insight, but also strengthens relations between railway professionals and railway enthusiasts. With an interactive and enthusiastic atmosphere, this activity is expected to build synergy between the parties involved, as well as encourage innovation and development of the railway sector in Indonesia.

11. Greening activities by cadets and academics	#1

 	The main campus of PPI Madiun

Description:
Greening activities carried out by cadets and academics of the Madiun Indonesian Railway Polytechnic in Madiun City's green open spaces are a significant initiative in an effort to improve the quality of the urban environment. In this event, participants planted coconut trees which not only beautify the area, but also contribute to carbon sequestration and reducing air pollution. Through this joint action, cadets and the academic community not only express concern for the environment, but also play an active role in creating public spaces that are healthier and more comfortable for the community. This activity is also an important educational tool, inviting people to care more about environmental sustainability and the importance of maintaining biodiversity in the city. With a collaborative spirit, it is hoped that this greening will be the first step towards a greener and more sustainable city.

12. River Cleaning Activities by cadets and academics	#1 The main campus of PPI Madiun
 	

Description:
The river cleaning activity held by the cadets and academic community of PPI Madiun at the Bantaran River, Madiun City, is a real action in maintaining environmental cleanliness and sustainability. In this activity, participants collaborate to remove rubbish and waste that pollutes rivers, so that they can restore ecosystem function and improve water quality. Through this cleanup, cadets and the academic community not only contribute to the beauty of the environment, but also increase public awareness of the importance of keeping rivers clean as a source of life. This activity is an educational tool that invites all parties to care more about the environment, as well as instilling the value of shared responsibility in preserving nature. With the spirit of mutual cooperation, it is hoped that this activity can create a cleaner and healthier environment for the people of Madiun City.

13. Collection of clothes not used by cadets to be distributed to local communities who need them	#1

 	The main campus of PPI Madiun

Description:
The activity of collecting unused clothes by PPI Madiun cadets and cadets is a social initiative that aims to help people in need. In this event, participants collect clothes that are still suitable for use from themselves and from the surrounding environment, then prepare them to be distributed to those who are less fortunate. This activity creates a sense of solidarity and care among campus members, as well as educating the community about the importance of sharing and reducing textile waste. With a spirit of togetherness, cadets and cadets not only provide direct assistance, but also instill deep human values, making this action a concrete form of their contribution to the welfare of society. This activity is carried out once a year.

14. Mount Lawu Expedition	
 	#1 The main campus of PPI Madiun

Description:
Every year, to celebrate the anniversary of PPI Madiun, the Nature Lovers Taruna organization (TARUPALA) holds a Mount Lawu expedition. This activity is not just a climb, but also a form of concern for the environment. The TARUPALA team invites members and participants to work together to clean up the rubbish found during the trip, as a real action to preserve natural beauty. In an atmosphere of togetherness and a spirit of sharing, they try to leave a positive footprint in nature, while strengthening bonds between members. With stunning views and fresh mountain air, this activity is an unforgettable moment, reminding all participants of the importance of protecting the environment and preserving nature for future generations.

The number of activities organized by student organizations related to sustainability per year is 80 activities per year

Some Pictures of sustainability activities are available on the additional evidence link:
https://drive.google.com/file/d/1uHlGQRGw1e65rbpfOD-8iu-7eOfC3XtN/view?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.12] Sustainability Report

<table>
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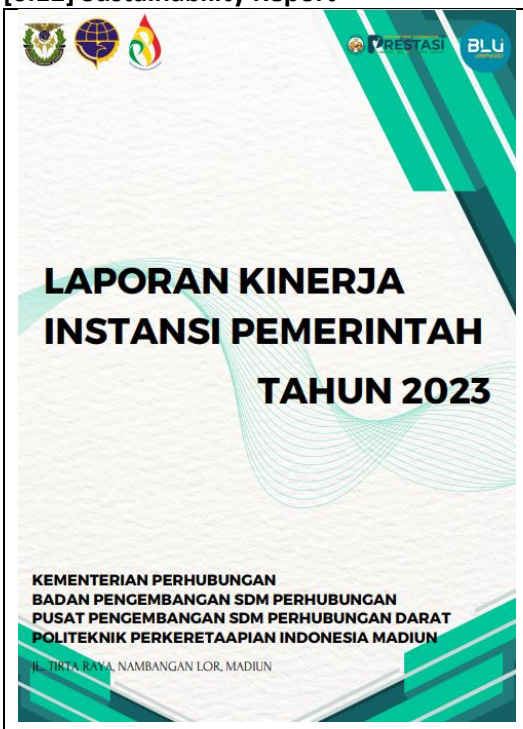
<td> 
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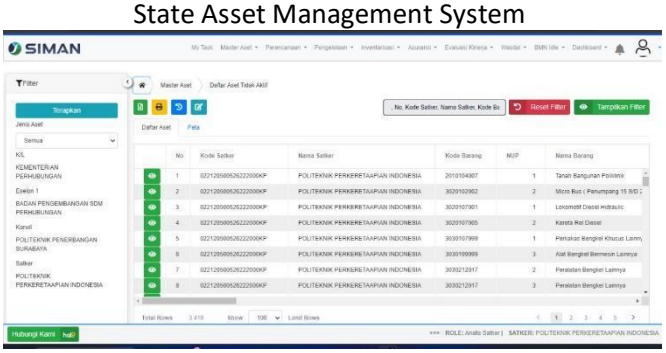
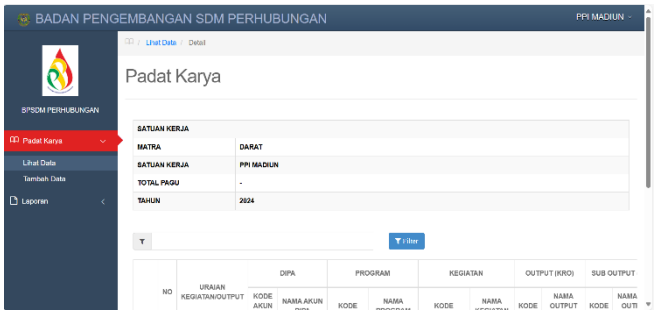
 

Labor Intensive Activities
 
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<td>#1 The main campus of PPI Madiun</td>
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<tr>
<td>Sustainability Report</td>
<td>Management Process Monitoring Dashboard</td>
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</table>

Description:
Sustainable activities carried out by PPI Madiun are listed in the performance reports of government agencies which are made every year. The report contains data on the vision and mission of PPI Madiun, work programs, performance targets and realization, service and financial performance reports, governance and accountability. Apart from that, PPI Madiun has a state asset monitoring dashboard which is usually called SIMAN (state asset management system) and labor-intensive activity monitoring dashboard

The full text of the 2023 Madiun Indonesian Railway Polytechnic Sustainability Report is available at this link: https://shorturl.at/JDBFK

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.14] Number of cultural activities on campus (e.g.Cultural Festival)

1. Batik Competition for the Anniversary	
 	#1 The main campus of PPI Madiun

Description:
In commemoration of the Anniversary of PPI Madiun, we are holding a Batik Making Competition which aims to preserve the art and culture of batik as Indonesia's cultural heritage. It is hoped that this activity can increase cadets' and academic community's appreciation of batik art and explore creativity. This competition will be held at PPI Madiun with participants from the cadets and academic community. The announcement of the winners will be made at the peak of the anniversary celebration accompanied by prize giving. Through this competition, we hope to encourage the younger generation to know and love batik culture better, as well as making this activity a forum for sharing inspiration and creative ideas.

2. Reog Ponorogo Art	
 	#1 The main campus of PPI Madiun

Description:
As part of the series of graduation ceremonies for PPI Madiun cadets, there was a Reog Ponorogo Dance performance, a traditional art that is rich in cultural and symbolic values. The Reog Ponorogo dance originates from East Java and is known for its dynamic movements and magnificent costumes, depicting the legendary

story of the battle between King Jenggala and King Ponorogo. This performance is not only entertainment, but also a form of respect for local culture that needs to be preserved. The dancers, consisting of cadets and cadets, will present a dance full of energy and expression, accompanied by typical gamelan music. In every movement, they will display courage and beauty, bringing the audience to a deep experience of the meaning and philosophy of Reog dance. It is hoped that this event will provide a more cheerful and memorable atmosphere at the graduation moment, as well as inviting graduates and invited guests to get to know and appreciate Indonesian culture better. Thus, the Reog Ponorogo Dance performance has become a symbol of diversity and cultural richness that should be celebrated at every opportunity.

3. Conditions for wearing traditional clothes every Tuesday	
 	#1 The main campus of PPI Madiun

Description:
In an effort to preserve and promote local culture, the Director of PPI Madiun made regulations regarding the use of traditional clothing every Tuesday on campus. This activity aims to increase awareness and appreciation of the richness of Indonesian culture, especially in the form of various traditional clothing. Every Tuesday, the entire academic community is required to wear traditional clothing from various regions in Indonesia. With this provision, it is hoped that the entire academic community can better appreciate and love national culture, and make it part of their everyday identity.

4. Traditional Dance Performance for Parents Day	
 	#1 The main campus of PPI Madiun

Description:
As part of the Parents Day event, PPI Madiun presented a Traditional Dance performance which aims to introduce the richness of Indonesian culture to the parents and families of the cadets. This activity is not only a means of entertainment, but also a form of appreciation for traditional art which is the nation's identity. The dancers, consisting of cadets, will perform dynamic and meaningful movements, depicting cultural and traditional stories. By presenting Traditional Dance on Parents Day, we hope to increase the feeling of love and

pride for Indonesian culture among students and parents, as well as making this moment a means to strengthen ties between families and PPI Madiun.
Traditional dance performance activities 5 times per year

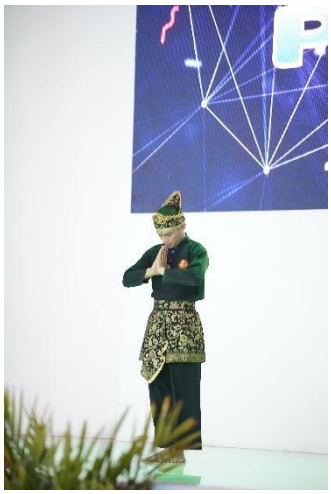
5. Dance Extracurricular	
 	#1 The main campus of PPI Madiun

Description:
Extracurricular Dance at PPI Madiun is a very important cultural activity because it provides space for cadets to develop dance skills, as well as strengthening a sense of togetherness and cultural identity. Extracurricular dance activities are carried out regularly every week. Extracurricular Dance is an important forum for cadets to express themselves, be creative, and be involved in cultural activities that enrich the cadets' academic experience.
Traditional dance extracurricular activities are held 24 times every year

6. Traditional Dance and Gamelan Dance	
 	#1 The main campus of PPI Madiun

Description:
As a series of graduations, dies natalis or other events,PPI Madiun presents dance performances, dance performances are performances that combine elements of dance, drama and music. Usually tells stories from mythology, legends, or everyday life. The ballet performance was designed and played by the cadets and accompanied by gamelan music which was also played by PPI Madiun cadets. This Traditional Dance and Gamelan Sendra performance is not only an artistic event, but also a means of preserving artistic traditions and providing an opportunity for cadets to learn about their cultural heritage.

7. Pencak Silat performance	#1

  	The main campus of PPI Madiun

Description:
As part of the cultural event, PPI Madiun held a performance of Pencak Silat, a traditional martial art that is rich in cultural and philosophical values. This activity aims to introduce and preserve Pencak Silat as a unique and valuable Indonesian cultural heritage. This performance will be performed by cadets who have trained in Pencak Silat, who will demonstrate technical skills and elegant and dynamic martial arts movements. In this performance, they will not only display defensive and attacking techniques, but also demonstrate the beauty of movements inspired by nature, as well as values such as discipline, courage and respect. We hope that this Pencak Silat performance can inspire the younger generation to know and love the nation's culture, and encourage them to be active in preserving traditional arts.

Total number of on-campus cultural activities organized by the university: 34 Events per year

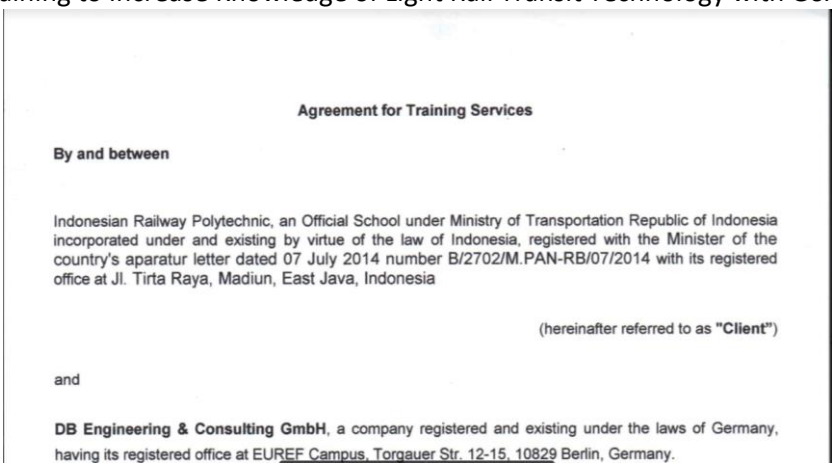
The pictures about cultural activities on campus are available at the evidence Link:
https://drive.google.com/drive/folders/1MLV4NZTlpHw4zU7yGbKXAaxBMljVvyH6?usp=drive_link

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.15] Number of university program(s) with international collaborations

1. Training to Increase Knowledge of Light Rail Transit Technology with GoA 3  **Agreement for Training Services** **By and between** Indonesian Railway Polytechnic, an Official School under Ministry of Transportation Republic of Indonesia incorporated under and existing by virtue of the law of Indonesia, registered with the Minister of the country's aparatur letter dated 07 July 2014 number B/2702/M.PAN-RB/07/2014 with its registered office at Jl. Tirta Raya, Madiun, East Java, Indonesia (hereinafter referred to as **"Client"**) and **DB Engineering & Consulting GmbH**, a company registered and existing under the laws of Germany, having its registered office at EUREF Campus, Torgauer Str. 12-15, 10829 Berlin, Germany.	#1 The main campus of PPI Madiun

Description:

Through the activity program to increase knowledge of light rail transit technology with GOA 3 in 2022, carried out in collaboration with the DB Rail Academy, where participants come from the Directorate General of Railways and PPI Madiun, have great potential in supporting transportation sustainability. Some of the positive impacts include:

Increased Awareness: The public and stakeholders better understand the benefits of LRT, including energy efficiency and reduced carbon emissions.

Adoption of New Technology: Better knowledge encourages governments and operators to use more advanced and environmentally friendly LRT technology.

Transportation System Integration: Encourage the integration of LRT with other modes of transportation, creating a more efficient system.

Sustainable Planning: Facilitate better urban planning, making LRT an integral part of spatial planning that supports sustainability.

Public Participation: Increase community involvement in transportation decisions, ensuring solutions adopted meet needs.

Economic Impact: Encourages regional economic growth through investment and job creation.

Thus, programs like GOA 3 are critical to advancing the sustainability of the transportation system as a whole.

Year 2022: 1 activity
Year 2023: - activity
Year 2024: 1 activity

2. Capacity Building Training Supervision of Safety Implementation in the Operation of High Speed Trains

MEMORANDUM OF UNDERSTANDING

BETWEEN

Southwest Jiaotong University, P.R. China

AND

Politeknik Perkeretaapian Indonesia Madiun

Politeknik Perkeretaapian Indonesia Madiun and Southwest Jiaotong University, desiring to establish collaborative relations between the two universities to promote friendship and to co-operate in a mutually beneficial partnership, have agreed that:

Description:

The capacity building program for safety supervision of the operation of high-speed trains in 2023 in collaboration with Southwest Jiaotong University was carried out to provide training to the Directorate General of Railways and lecturers at PPI Madiun regarding the significant impact of supervision of the operation of high-speed trains on the sustainability of transportation. Some of the impacts include:

1. Improved Safety: Improve oversight to minimize the risk of accidents and maintain public trust.
2. Operational Efficiency: Improve train operational efficiency, reducing travel time and costs.
3. Emission Reduction: Minimizes dependence on private vehicles, contributing to reduced carbon emissions.
4. Technological Innovation: Driving the adoption of new technologies that are safer and more efficient.
5. Enhancement of Workforce Skills: Train the workforce for better and safer management of the train system.
6. Economic Impact: Increases regional economic attractiveness, attracts investment, and creates jobs.

Year 2022: - activity
Year 2023: 1 activity
Year 2024: - activity

3. Program Knowledge Sharing for Indonesia - Ministry of Land, Infrastructure and Transport and KORAIL

Program Information

Program:
Knowledge Sharing Course for Indonesia

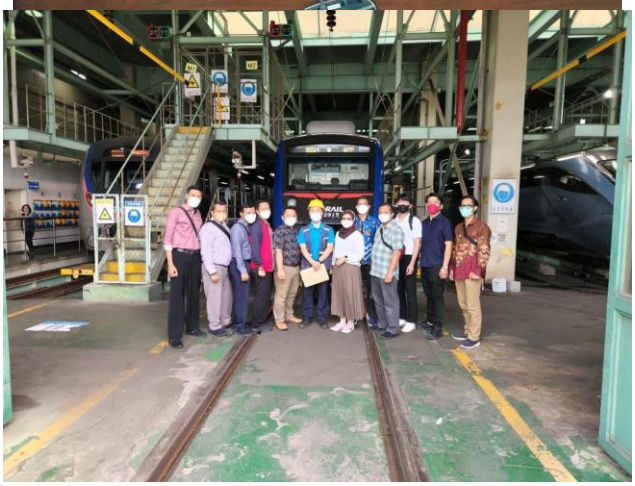
August 1 (MON) – 27 (Sat), 2022
Seoul, Korea

Ministry of Land, Infrastructure and Transport

KORAIL KOREA RAILROAD

Date	Duration	Contents	Remark
8.16.	10:00 ~ 11:30	(Lecture_1) Korea's railway operation and development	
	13:30 ~ 14:30	(Lecture_2) Developing Cooperation Programme for Nurturing Railway Experts	
	15:00 ~ 16:00	Businnes meeting & Country Report Preparation	
	16:00 ~ 17:00	(Action Plan_1) Initial presentation of PCP	
	17:00 ~ 18:00	(Visit_1) Seoul Station	서울
8.17.	09:30 ~ 10:30	Korea's railway rolling stock maintenance system	
	10:30 ~ 11:30	Public Transport and Metro Railroad	
	13:00 ~ 14:00	(Lecture 5) International Cooperation Project Strategies and Cases	

Date	Duration	Contents	Remark
	15:00 ~ 18:00	(Vist 2) Highspeed Train Maintenance Depot	
8.18.	09:30 ~ 10:30	(Lecture 6) Korea's status in Mobility using ITS	
	10:30 ~ 11:30	(Lecture 7) ITS Architecture & Standardization	
	13:00 ~ 14:00	(Lecture 8) Integrated Ticketing Platform for Seamless Mobility	
	15:00 ~ 17:00	(Vist 3) Korea Expressway Corporation Traffic Center	
8.19.	09:30 ~ 10:30	(Lecture 9) Introduction of Korea's Road Safety Policy	
	10:30 ~ 11:30	(Lecture 10) Road Management System	
	13:00 ~ 18:00	(Vist 4) Driving Simylator	
8.20.	-	Korean culture Experience	
8.22.	09:30 ~ 11:30	(Action Plan_2) Reviewing and discussion with experts	
	13:00 ~ 14:00	(Lecture 11) Korea Logistics-related Construction Policy and Technology Trend	
	1400 ~ 15:00	(Lecture 12) Development Direction for Trans-Korean Railway Logistics	
	16:00 ~ 18:00	(Vist 5) LogisValley	
8.23.	09:30 ~ 10:30	(Lecture 12) Overloaded Vehicle Control SYstem	
	10:30 ~ 11:30	(Lecture 13) Future Mobility	
	14:00 ~ 18:00	The 12th Korea-Asean cooperation forum	
8.24.	09:30 ~ 10:30	(Lecture 14) Bridge Inspection Technology	
	10:30 ~ 11:30	(Lecture 15) Developing Rolling Stocks Powered by Hydrogen Fuel Cell	
	14:00 ~ 15:00	(Vist 6) Railway Traffic Control Centre	
	16:00 ~ 18:00	(Vist 7) Hyundai Motors Studio	
8.25.	09:30 ~ 11:30	(Vist 8) Obong Station & Uiwang ICD	
	13:00 ~ 14:00	(Lecture 17) Human recourse development strategy and system	
	14:00 ~ 16:00	(Vist 9) KORAIL HRD Institute	

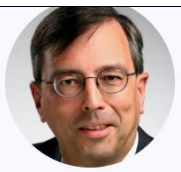


Description:

This program was attended by PPI Madiun where in this program the development and experience of the Korean government was provided in building green energy for its trains as well as sustainable transport systems and their integration. Through the program in 2022, a sustainable program will be prepared to realize collaborative cooperation between Indonesia and Korea in developing railways in Indonesia.

Year 2022: 1 activity
Year 2023: - activity
Year 2024: - activity

Prof. Ir Leksmono Suryo Putranto M.T., Ph.D
Universitas Tarumanagara, Indonesia
|Google|Scopus|



Prof. Dr.Ing. Jorn Pachl
Institut Fur Eisenbahnwesen Und Verkehrssicherung, German
|Google|Scopus|

Prof. Ir. Sri Atmaja P. Rosyidi M.Sc., Ph.D
Universitas Muhammadiyah Yogyakarta, Indonesia
|Google|Scopus|

Anggy Eka Pratiwi, S.T., M.E
Indian Institute of Technology Jodhpur, India
|Google|Scopus|

Dr. Willy Artha Wirawan, M.T
Politeknik Penerbangan Surabaya, Indonesia
|Google|Scopus|

Dra. Atik R.R. Siti Kuswati, M.M.Tr
Politeknik Perkeretaapian Indonesia Madiun
|Google|Scopus|

Description:
Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun) actively manages international journals Journal of Railway Transportation and Technology, in the process of reviewing articles submitted to the journal, in collaboration with professors from the Technische Universität Braunschweig, lecturers from the Indian Institute of Technology Jodhpur, India. Through this collaboration, articles discussing sustainable transport have been screened and published over the years this journal has been published.

Year 2022: 2 activity
Year 2023: 2 activity
Year 2024: 2 activity

ICORT2023 Keynote

Development of transportation towards sustainable, energy-efficient, and respectful for the environment.

Hiroyasu Kobayashi (Chiba University, Japan)

CHIBA
UNIVERSITY

Description:
PPI Madiun holds the ICORT International conference, with the big theme of Sustainability Transportation, where in this activity various foreign universities are invited to provide ideas in the field of sustainability transportation which can stimulate joint research activities in this field.
Year 2022: 1 activity
Year 2023: 1 activity
Year 2024: - activity

Number_of_university_sustainability_program(s)_with_international_collaborations
Total number of sustainability/environment related events in:
2022: 5
2023: 4
2024: 3
A total average per annum over the last 3 years of **4 program**

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.16] Number of sustainability community services project organized and/or involving students

Project Name	Participants	Project Duration	Project Area
Optimization of SHM Utilization (*Solar Home System*) As an Environmentally Friendly Electric Energy Generator	50 people	April 20, 2021 (1 day)	YES, EC
Utilization Training *Fly Ash* As a mixture for making bricks in Geger Madiun	100 people	14-15 September 2021 (2 days)	WS
Creation and Socialization of Wind Turbine Energy Harvesting *Savonius Type Helix* For the 21st Motto for the Millennial Generation	40 people	September 12, 2023 (1 day)	EC, TR
Increasing Competency Through Railway Electrical Installation Training	100 people	June 14, 2023 (1 day)	ED
Counseling on the Use of Solar Energy as Alternative Energy at the Subulul Huda Islamic Boarding School	300 people	November 23, 2021 (1 day)	EC
PPI Madiun Cares for the Earth Implements River Cleaning and Tree Planting in Madiun City	150 people	September 21, 2024 (1 day)	WR
Power Plant Design *Micro Hydro* (PLTMH) PPI Madiun	50 people	January 5, 2021 (1 day)	YES, EC
Socialization and Installation of Solar Cell-Based Street Lights in Dongol Hamlet, Geneng District, Ngawi District	20 people	4-5 October 2021 (2 days)	AND
Socialization of the concept of energy efficient housing	20 people	May 12, 2022 (1 day)	EC, ED

Description:

1. Optimization of SHM Utilization (*Solar Home System*) As an Environmentally Friendly Electric Energy Generator

   Technology development *Solar Home System* (SHM) is in line with the vision *greenmetric* which focuses on environmental sustainability and the use of renewable energy. SHM, which uses solar power as an environmentally friendly energy source, helps reduce people's dependence on fossil energy and the PLN

electricity network whose costs continue to increase. This community service program supports the initiative *GreenMetric* by offering energy solutions that are clean, efficient, and accessible to communities in remote areas, while encouraging the use of renewable energy in accordance with the principles of sustainable development in Indonesia.

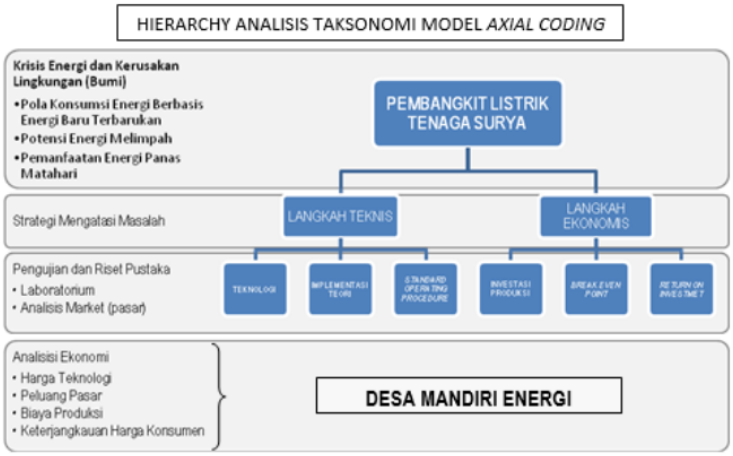


Figure 1. Energy analysis

2. Utilization Training *Fly Ash* As a mixture for making bricks in Geger Madiun

Usage of fly *ash* in making bricks in line with the initiative greenmetric which focuses on waste management and the use of environmentally friendly materials. Utilizing fly ash waste from coal as a brick mixture contributes to reducing the negative environmental impacts produced by industrial waste, as well as supporting the reduction in the use of cement which requires a lot of energy in the production process. This training program not only strengthens the skills of brick craftsmen in Geger, Madiun, but also supports sustainability goals by maximizing the use of waste into more cost-effective and environmentally friendly products.

Figure 2. Implementation of direct practice of making bricks with a mixture *fly ash*

3. Creation and Socialization of Wind Turbine Energy Harvesting *Savonius Type Helix* For the 21st Motto for the Millennial Generation

Use of wind energy through turbines *Savonius type helix* in this activity supports the program *greenmetric* which emphasizes the use of renewable energy and environmentally friendly technology. Wind energy, as a clean and easily accessible energy source, is a sustainable solution to meet energy needs, especially for the 21 train system. This program not only introduces renewable energy technology to the millennial generation, but also encourages the implementation of more efficient and environmentally friendly innovations in the transportation sector, in accordance with sustainability principles.

Figure 3. Socialization of wind turbines to electrify Slogan 21
Source: https://drive.google.com/file/d/1drUEGDcpueFRuYO7fIX5Z9ztiBmHBuiX/view?usp=drive_link

4. Increasing Competency Through Railway Electrical Installation Training

   This railway electrical installation training is in line with the GreenMetric program which emphasizes the importance of safety and the application of sustainable technology. By improving technicians' skills in implementing appropriate electrical installation standards, this program plays a role in reducing the risk of fire due to installation errors, as well as ensuring that railway infrastructure operations occur safely and efficiently. Apart from providing practical skills to participants, this activity also contributes to the sustainability of public transportation operations which are safer and more environmentally friendly.

Figure 4. Practical implementation of exchange switch applications in electrical installations
Source: https://drive.google.com/file/d/1U6ofXO9DKy33DY5Jw4tztMs-awU-jEui/view?usp=drive_link

5. Counseling on the Use of Solar Energy as Alternative Energy at the Subulul Huda Islamic Boarding School

   Counseling about the use of solar energy as an alternative at the Subulul Huda Islamic Boarding School is in line with the greenmetric program, which focuses on the use of renewable energy and reducing dependence on conventional energy sources. By increasing students' understanding of the benefits of solar energy as an alternative electricity generator, this program also encourages awareness of the importance of environmental sustainability. Apart from providing practical insight into clean energy technology, this activity also plays a role in forming a community that cares more about the environment and supports the implementation of sustainable energy in the future.

Figure 5. The team explained the performance of the tool to the students

6. PPI Madiun Cares for the Earth Implements River Cleaning and Tree Planting in Madiun City

   The "PPI Madiun Cares for the Earth" activity, which includes river clean-up actions and tree planting, is in line with the GreenMetric initiative which emphasizes environmental conservation and ecosystem sustainability. By carrying out river clean-up actions, this program aims to reduce water pollution and improve environmental quality in Madiun City. In addition, tree planting plays a role in reforestation efforts and carbon sequestration, which is crucial for fighting climate change. This activity not only increases public awareness of the importance of protecting the environment, but also encourages active participation in preserving nature for a more sustainable future.

(a) (b)

Figure 6. The team carried out (a) cleaning rivers and (b) planting trees in Madiun City
Source: https://www.youtube.com/watch?v=rl1RLzO8Ih4

7. Power Plant Design Micro Hydro (PLTMH) Indonesian Railway Polytechnic Madiun

   The "Design and Build a Micro Hydro Power Plant (PLTMH)" project at PPI Madiun is in line with the GreenMetric initiative which emphasizes the use of renewable energy and sustainability. By utilizing hydropower sources from reservoir channels on campus, this project aims to develop a simple electricity generation system that combines micro-hydro and solar power. The research methods used include making tool prototypes and measuring various parameters from the use of turbines and solar panels. The research results show that the available water flow is 14 liters per minute, where the micro hydro generator can produce varying voltages, while the solar panels function as an effective backup source. This initiative not only provides clean and sustainable energy solutions, but also increases public awareness about the importance of efficient use of natural resources.

Figure 7. Generator prototype *micro hydro*

8. Socialization and Installation of Solar Cell-Based Street Lights in Dongol Hamlet, Geneng District, Ngawi District

   The project "Socialization and Installation of Solar Cell Based Street Lights in Dongol Hamlet" is in line with the GreenMetric initiative which focuses on the use of renewable energy and environmental sustainability. By utilizing solar cells as a power source for street lighting, this activity provides education to the public about the importance of switching to environmentally friendly energy, as well as involving them in the practice of directly installing solar-based PJUs. This program not only broadens the community's insight and skills in using clean energy, but also strengthens relations between the campus and the community, while making a real contribution to sustainable development in the village.

Figure 8. Socialization of how solar cell-based PJUs work

9. Socialization of the concept of energy efficient housing

   The "Socialization of the Concept of Energy-Efficient Housing" program supports the initiative *greenmetric* which focuses on energy efficiency and sustainability. This project aims to educate the public about the importance of saving energy in residential homes and offer practical steps for its implementation. By delivering material that is easy to understand and supported by experts, the public is introduced to basic

energy saving concepts and how to apply them. Apart from increasing awareness, this activity also encourages concrete action in households to reduce energy consumption, as well as strengthening commitment to environmental conservation and long-term sustainability.

Figure 9. Alternative energy for the future

The PPI Madiun Channel is available at the link: https://www.youtube.com/@ppiacid)

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : www.ppi.ac.id

[6] Education and Research (ED)

[6.17] Number of sustainability-related startups

No.	Information
1	**Startup name:** PPI Madiun Livestock Cage **Startup category in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** WS, WR **Description:** Startup livestock enclosure PPI Madiun is committed to implement sustainability principles that are in line with standards *greenmetric*, with a focus on developing a more environmentally friendly and efficient livestock environment. Through the use of renewable energy technology such as biogas from livestock waste as well as optimal and sustainable land use, this startup plays a role in supporting green metric efforts to reduce carbon emissions and maximize resource efficiency. The PPI Madiun livestock pen also encourages the creation of a sustainable livestock ecosystem that is oriented towards a greener future. Number of officers: 1 person Starting Business: 2023 Business profit per year: 2023 : 0 2024 : 0 Note: Livestock business is currently not a university business priority, and there are no experts in this field **Photos:**  **Figure 1.** Livestock enclosure at PPI Madiun

2	**Startup name:** Porang Plant Cultivation **Startup category in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** WS, WR **Description:** *Startup* Porang cultivation is committed to implement sustainability principles according to greenmetric standards with the aim of creating an efficient and environmentally friendly agricultural system. By optimizing sustainable land management and utilizing modern agricultural technology, this startup supports the green metric vision in reducing carbon emissions and increasing resource efficiency. Porang cultivation plays an important role in developing agricultural models that preserve the environment, as well as contributing to the sustainability of the agricultural sector in the future. Number of officers: 2 people Starting Business: 2020 Business profit per year 2020 : 0 2021 : 0 2022 : 0 2023 : 0 2024 : 0 Note: Livestock business is currently not a university business priority, and there are no experts in this field **Photos:**  **Figure 2.** Porang cultivation at PPI Madiun

3	**Startup name:** Bottled Drinking Water (AMDK) **Startup category in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** WR **Description:** *Startup* Sustainable management of bottled drinking water focuses on reducing environmental impacts through various innovations. By using a replenishment system, companies can minimize resource use. Additionally, efficient water purification technology ensures that the produced water is not only safe for consumption, but also minimizes energy use. This approach supports environmental sustainability by educating consumers about the importance of reusing packaging and maintaining the quality of water resources, making it the ultimate solution to the challenge of the water crisis. Number of employees: Starting Business: 2020 Business profit per year: 9 people 2020 : 0 2021 : 0 2022 : 0 2023 : 0 2024 : 0 Information: The AMDK business is currently still being produced internally for the university **Photos:**  **Figure 3.** Management of Bottled Drinking Water at PPI Madiun

4	**Startup name:** Wet Kitchen **Startup category in UI Greenmetric questionnaire (SI, EC, WS, WR, TR, ED):** WS, WR

	Description: *The* wet kitchen start-up located near the student dining room is designed to support a sustainability concept based on standards *greenmetric*. This kitchen processes organic waste from cooking activities into compost which is used as fertilizer for plants in the campus area. In addition, wet kitchens implement efficient clean water management, by utilizing water optimally and minimizing waste. This approach not only helps reduce carbon emissions, but also creates an ecosystem that supports sustainable resource management in the campus environment. Number of officers: 32 officers Starting Business: 2022 Profit/year: 2022 : 0 2023 : Rp. 50,000,000 2024 : Rp. 150,000,000 **Photos:**   **Figure 4.** The wet kitchen is located near the student dining room

The PPI Madiun Channel is available at the link:
https://www.youtube.com/@ppiacid

UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : ppi.ac.id

[6] Education and Research (ED)

[6.18] Total number of graduates with green jobs (for the last 3 years)

Academic Year	Faculty/Department	Total Graduates	Graduates with Green Jobs	Description of Green Jobs	Data Source
2020/2021	Building and Railway Technology	**72**	**8**	• The work carried out by alumni in the field of inspection and testing on tracks and buildings aims to ensure the reliability of railway civil infrastructure for the safe operation of train journeys in the context of sustainable transportation • The work carried out by alumni in the field of civil infrastructure maintenance aims to reduce environmental impacts through maintaining environmentally friendly infrastructure, increasing energy efficiency, and implementing green technology • The work carried out by alumni in the field of monitoring and data management of railway track and building infrastructure directly contributes significantly to efforts to protect the environment and support sustainable development in the transportation sector	**Tracer Study**

2020/2021	Railway Electrical Technology	72	20	• The work carried out by alumni in the field of inspection and testing of train operating facilities in the form of electrical and electronic devices aims to ensure the reliability of the operating system for safe train travel in the framework of sustainable transportation • Work carried out by alumni in the field of maintenance and increasing the efficiency of train electronic devices to reduce energy consumption and emissions, as well as ensure optimal performance that supports a sustainable transportation system. • The work carried out by alumni in the field of monitoring and data management of railway operating facilities directly contributes significantly to efforts to protect the environment in the management of efficient and green technology-based railway operations.	**Tracer Study**

2020/2021	Railway Mechanics Technology	68	36	• Work carried out by alumni in the field of inspection and testing of railway facilities which aims to ensure the reliability of railway facilities for efficient, energy-saving and sustainable railway operations • Work carried out by alumni in the field of maintaining train mechanical components to increase efficiency, reduce resource consumption, and extend equipment life, thereby supporting a more sustainable and energy efficient transportation system. • The work carried out by alumni in the field of monitoring and data management of railway facilities directly contributes significantly to the development of more sustainable and environmentally friendly railway transportation	**Tracer Study**

2020/2021	Railway Transportation Management	99	49	• The work carried out by alumni in the field of train operations as organizers and controllers of train travel aims to optimize the management of operations, routes and transport capacity to increase energy efficiency, reduce emissions and support the safety and sustainability of more environmentally friendly transportation. • Work carried out by alumni in the field of evaluating train services and operations by analyzing energy performance, auditing the suitability of service and operational performance so as to create a sustainable transportation system	**Tracer Study**

2021/2022	Building and Railway Technology	77	26	• The work carried out by alumni in the field of inspection and testing on tracks and buildings aims to ensure the reliability of railway civil infrastructure for the safe operation of train journeys in the context of sustainable transportation • The work carried out by alumni in the field of civil infrastructure maintenance aims to reduce environmental impacts through maintaining environmentally friendly infrastructure, increasing energy efficiency, and implementing green technology • The work carried out by alumni in the field of monitoring and data management of railway track and building infrastructure directly contributes significantly to efforts to protect the environment and support sustainable development in the transportation sector	**Tracer Study**

2021/2022	Railway Electrical Technology	69	26	• The work carried out by alumni in the field of inspection and testing of train operating facilities in the form of electrical and electronic devices aims to ensure the reliability of the operating system for safe train travel in the framework of sustainable transportation • Work carried out by alumni in the field of maintenance and increasing the efficiency of train electronic devices to reduce energy consumption and emissions, as well as ensure optimal performance that supports a sustainable transportation system. • The work carried out by alumni in the field of monitoring and data management of railway operating facilities directly contributes significantly to efforts to protect the environment in the management of efficient and green technology-based railway operations.	**Tracer Study**

2021/2022	Railway Mechanics Technology	69	22	• Work carried out by alumni in the field of inspection and testing of railway facilities which aims to ensure the reliability of railway facilities for efficient, energy-saving and sustainable railway operations • Work carried out by alumni in the field of maintaining train mechanical components to increase efficiency, reduce resource consumption, and extend equipment life, thereby supporting a more sustainable and energy efficient transportation system. • The work carried out by alumni in the field of monitoring and data management of railway facilities directly contributes significantly to the development of more sustainable and environmentally friendly railway transportation	**Tracer Study**

2021/2022	Railway Transportation Management	127	16	• The work carried out by alumni in the field of train operations as organizers and controllers of train travel aims to optimize the management of operations, routes and transport capacity to increase energy efficiency, reduce emissions and support the safety and sustainability of more environmentally friendly transportation. • Work carried out by alumni in the field of evaluating train services and operations by analyzing energy performance, auditing the suitability of service and operational performance so as to create a sustainable transportation system	**Tracer Study**

2022/2023	Building and Railway Technology	71	11	• The work carried out by alumni in the field of inspection and testing on tracks and buildings aims to ensure the reliability of railway civil infrastructure for the safe operation of train journeys in the context of sustainable transportation • The work carried out by alumni in the field of civil infrastructure maintenance aims to reduce environmental impacts through maintaining environmentally friendly infrastructure, increasing energy efficiency, and implementing green technology • The work carried out by alumni in the field of monitoring and data management of railway track and building infrastructure directly contributes significantly to efforts to protect the environment and support sustainable development in the transportation sector	**Tracer Study**

2022/2023	Railway Electrical Technology	74	15	• The work carried out by alumni in the field of inspection and testing of train operating facilities in the form of electrical and electronic devices aims to ensure the reliability of the operating system for safe train travel in the framework of sustainable transportation • Work carried out by alumni in the field of maintenance and increasing the efficiency of train electronic devices to reduce energy consumption and emissions, as well as ensure optimal performance that supports a sustainable transportation system. • The work carried out by alumni in the field of monitoring and data management of railway operational facilities directly contributes significantly to efforts to protect the environment in the management of efficient and green technology-based railway operations.	**Tracer Study**

2022/2023	Railway Mechanics Technology	84	13	• Work carried out by alumni in the field of inspection and testing of railway facilities which aims to ensure the reliability of railway facilities for efficient, energy-saving and sustainable railway operations • Work carried out by alumni in the field of maintaining train mechanical components to increase efficiency, reduce resource consumption, and extend equipment life, thereby supporting a more sustainable and energy efficient transportation system. • The work carried out by alumni in the field of monitoring and data management of railway facilities directly contributes significantly to the development of more sustainable and environmentally friendly railway transportation	**Tracer Study**

2022/2023	Railway Transportation Management	96	8	• The work carried out by alumni in the field of train operations as organizers and controllers of train travel aims to optimize the management of operations, routes and transport capacity to increase energy efficiency, reduce emissions and support the safety and sustainability of more environmentally friendly transportation. • Work carried out by alumni in the field of evaluating train services and operations by analyzing energy performance, auditing the suitability of service and operational performance so as to create a sustainable transportation system	**Tracer Study**
Total			250		

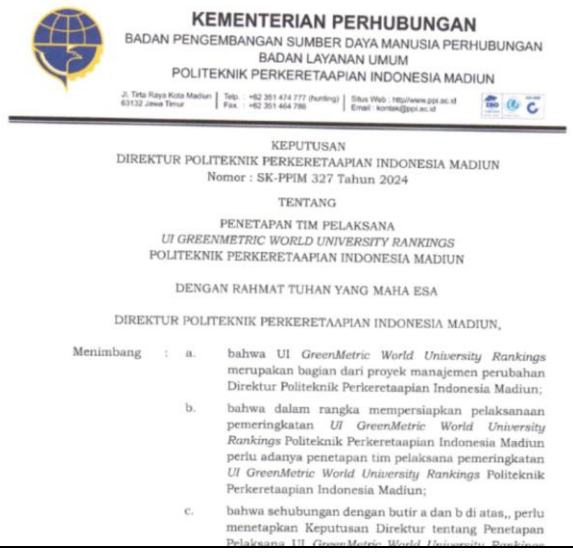
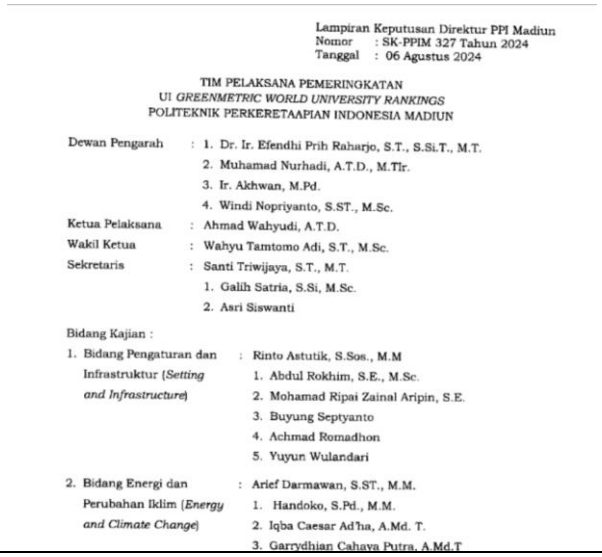
Tracer Study Link:
https://docs.google.com/spreadsheets/d/1Lm8FhhmBh5qR6UPkeZ1HwR5bvvD3mhgA/edit?usp=sharing&ouid=108785574565876317972&rtpof=true&sd=true

Template for Evidence(s)
UI GreenMetric Questionnaire

University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : ppi.ac.id

[6] Education and Research (ED)

[6.19] Availability of unit(s) or office(s) that coordinate sustainability on campus

Examples of university leader decree of establishment, structure and activities (Padjadjaran University, Indonesia)
 
Decision of the Director of Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun), to Form a UI Greenmetric World University Rankings Document Preparation Team

KEMENTERIAN PERHUBUNGAN
BADAN PENGEMBANGAN SUMBER DAYA MANUSIA PERHUBUNGAN
BADAN LAYANAN UMUM
POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN

KEPUTUSAN
DIREKTUR POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN
Nomor : SK-PPIM 327 Tahun 2024

TENTANG

PENETAPAN TIM PELAKSANA
UI GREENMETRIC WORLD UNIVERSITY RANKINGS
POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN

DENGAN RAHMAT TUHAN YANG MAHA ESA

DIREKTUR POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN,

Menimbang : a. bahwa UI *GreenMetric World University Rankings* merupakan bagian dari proyek manajemen perubahan Direktur Politeknik Perkeretaapian Indonesia Madiun;

b. bahwa dalam rangka mempersiapkan pelaksanaan pemeringkatan *UI GreenMetric World University Rankings* Politeknik Perkeretaapian Indonesia Madiun perlu adanya penetapan tim pelaksana pemeringkatan *UI GreenMetric World University Rankings* Politeknik Perkeretaapian Indonesia Madiun;

c. bahwa sehubungan dengan butir a dan b di atas,, perlu menetapkan Keputusan Direktur tentang Penetapan Pelaksana UI *GreenMetric World University Rankings*

Lampiran Keputusan Direktur PPI Madiun
Nomor : SK-PPIM 327 Tahun 2024
Tanggal : 06 Agustus 2024

TIM PELAKSANA PEMERINGKATAN
UI *GREENMETRIC WORLD UNIVERSITY RANKINGS*
POLITEKNIK PERKERETAAPIAN INDONESIA MADIUN

Dewan Pengarah : 1. Dr. Ir. Efendhi Prih Raharjo, S.T., S.Si.T., M.T.
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3. Ir. Akhwan, M.Pd.
4. Windi Nopriyanto, S.ST., M.Sc.

Ketua Pelaksana : Ahmad Wahyudi, A.T.D.
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Sekretaris : Santi Triwijaya, S.T., M.T.
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2. Asri Siswanti

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1. Abdul Rokhim, S.E., M.Sc.
2. Mohamad Ripai Zainal Aripin, S.E.
3. Buyung Septyanto
4. Achmad Romadhon
5. Yuyun Wulandari

2. Bidang Energi dan Perubahan Iklim (*Energy and Climate Change*) : Arief Darmawan, S.ST., M.M.
1. Handoko, S.Pd., M.M.
2. Iqba Caesar Adha, A.Md. T.
3. Garrydhian Cahaya Putra, A.Md.T

Description:
(*Please describe the availability of unit(s) or office(s) that coordinate sustainability on campus. The following is an example of the description. You can describe more related items if needed*.)

To prepare a UI Greenmetric document regarding measuring sustainability on campus and supporting the SDGs, the form of team consist of various experts, determine the division of tasks, schedule regular meetings, and create a document structure that includes an introduction, methodology, data analysis, findings, recommendations, and implementation plans and follow-up. The team that is formed in a comprehensive manner will carry out discussions, planning and reviewing steps and assess the implementation of sustainability in planning and infrastructure, energy and climate change, waste management, water, transportation as well as education and research at PPI Madiun.

Template for Evidence(s)
UI GreenMetric Questionnaire

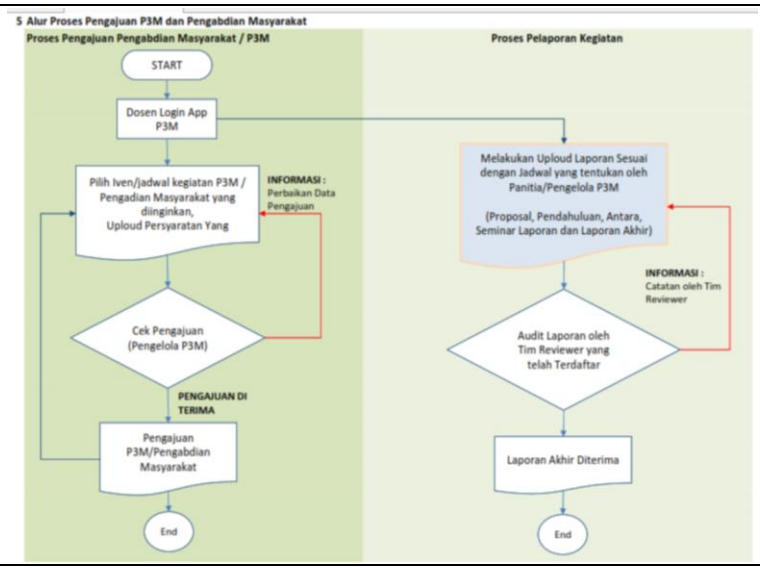
University : Politeknik Perkeretaapian Indonesia Madiun (PPI Madiun)
Country : Indonesia
Web Address : ppi.ac.id

[6] Education and Research (ED)

[6.20] Planning, implementation, monitoring and/or evaluation of university governance through the utilization of Information and Communication Technology (ICT)
1. Research

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Research Grant Announcement	SIPPMAS Application with SSO	Research Roadmap, Research Grant Announcement, Research Proposal	January	P3M
	Submit Research Proposal	SIPPMAS Application with SSO	Research Proposal	January-February	Proposer
	Determination of Selected Research Title	SIPPMAS Application with SSO	Research Proposal, Research Roadmap, Roadmap Compliance Form	March	P3M
	Appointment of Proposal Reviewers	SIPPMAS Application	Assignment Decree	March	P3M
	Research Proposal Review	SIPPMAS Application with SSO	Proposal Review Form	March-April	Reviewer/Bestari Partner
	Research Proposal Improvement	SIPPMAS Application with SSO	Proposal Review Results, Research Proposal	March-April	Proposer
Implementation	Determination of Research Title	SIPPMAS Application with SSO	Research Grant Decree, Research Contract	April	P3M
	Disbursement of Phase I Research Funds		Research Fund Receipt	April	Financial department
Monitoring	Monitoring Research Progress	SIPPMAS Application with SSO	Interim Research Report	July	P3M
	Submit Research Results	SIPPMAS Application with SSO	Research Report	October	P3M
Evaluation	Determination of Research Results Assessors		Decree on the Determination of Research Result Assessors	October	P3M
	Research Results Seminar		Research Report	October	P3M
	Research Results Assessment		Research Result Assessment Form	October	Assessment Team
	Disbursement of Research Funds Phase II		Research Fund Receipt, BAST Research Results	October	Finance, P3M
	Monitoring of Research Article Publication	SINTA	Publication Report	Annual	P3M

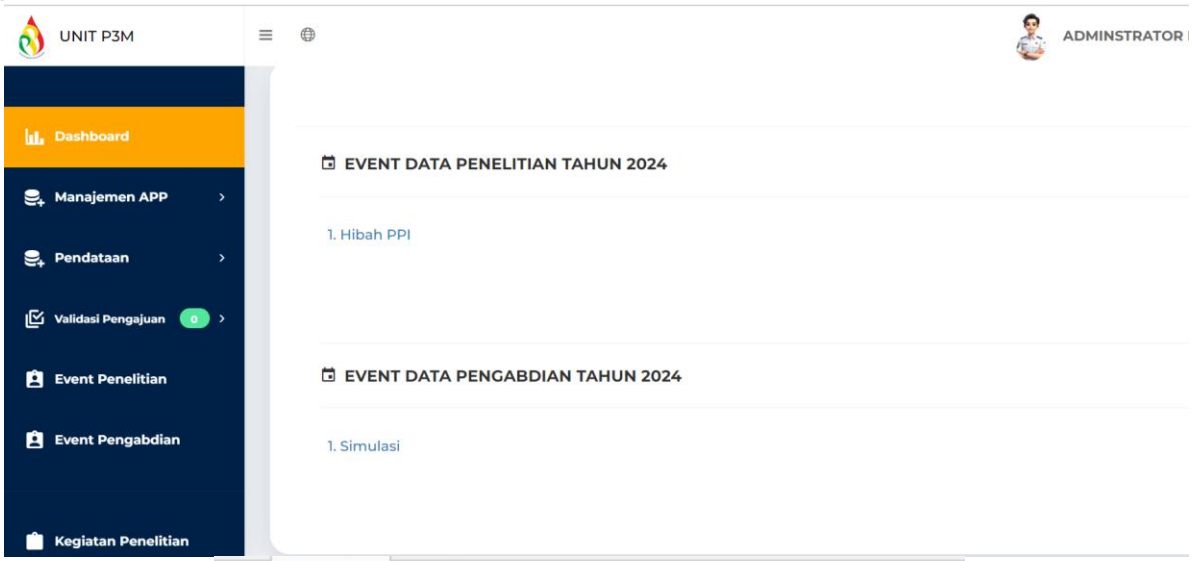
	Inventory of Research Article Publications	SINTA	Impact assessment reports, citation metrics	Annual	P3M

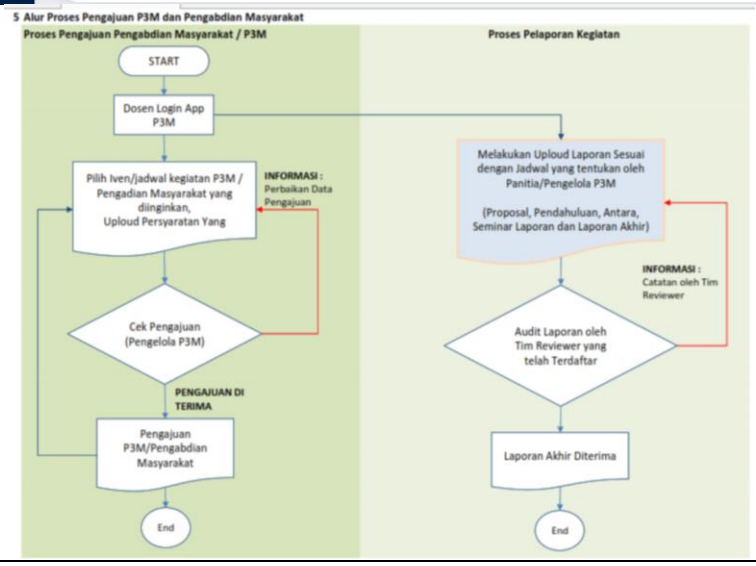


Grant Management System

2. Community Service

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Community Service Activity Announcement	SIPPMAS Application with SSO	Community Service Activity Announcement, Community Service Proposal	January	P3M
	Submit Community Service Proposal	SIPPMAS Application with SSO	Community Service Proposal	January-February	Proposer
	Determination of Selected Community Service Titles	SIPPMAS Application with SSO	Community Service Proposal	March	P3M
	Appointment of Proposal Reviewers	SIPPMAS Application	Assignment Decree	March	P3M
	Community Service Proposal Review	SIPPMAS Application with SSO	Proposal Review Form	March-April	Reviewer
	Community Service Proposal Improvement	SIPPMAS Application with SSO	Proposal Review Results, Community Service Proposal	March-April	Proposer
Implementation	Determination of Community Service Title	SIPPMAS Application with SSO	Community Service Decree, Community Service Contract	April	P3M
	Disbursement of Phase I Community Service Funds		Research Fund Receipt	April	Financial department
	Implementation of Community Service		Assignment Letter, Activity Request Letter, Activity Documentation	April-October	
Monitoring	Monitoring and Reporting on the Implementation of Community Service	SIPPMAS Application with SSO	Community Service Report	October	P3M
	Disbursement of Community Service Funds Phase II		Receipt of Community Service Funds	October	Finance, P3M
Evaluation	Determination of Community Service Results Assessors		Decree on the Determination of Community Service Results Assessors	October	P3M
	Assessment of Community Service Results and Impact		Community Service Results Assessment Form	October	Assessment Team

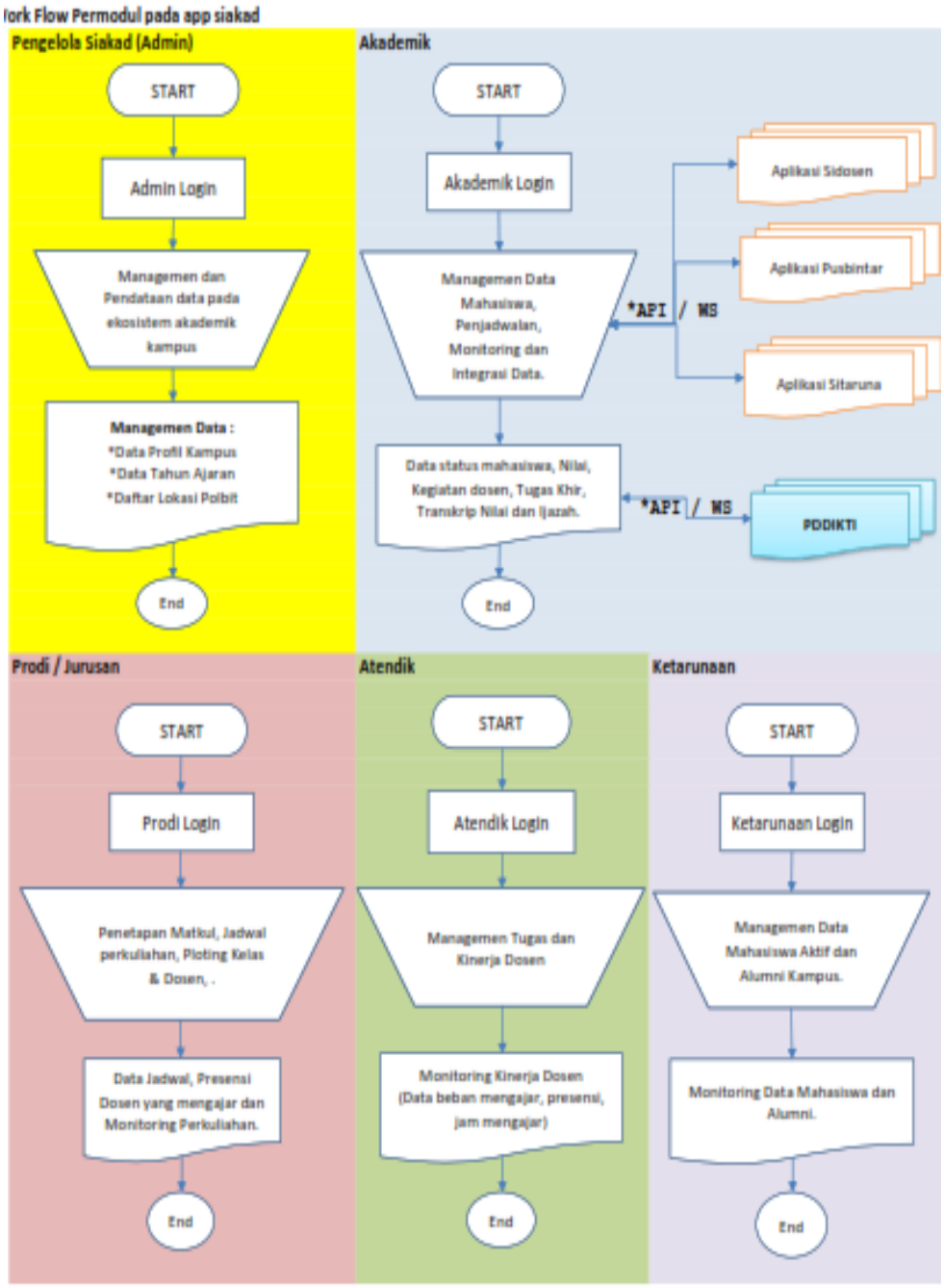




Grant Management System

3. Education

Stage	Activities/Programs	ICT Utilization	Evidence	Timeline	Responsible Team/Department
Planning	Courses and instructors are determined		Teaching Certificate	Before the semester starts	Study program
	Preparation of Lecture Schedule		Lecture Schedule	Before the Semester Starts	Study Program
	Student and Class Determination	SIAKAD	KRS	Before the Semester Starts	Study Program
	Preparation of Semester Lecture Plan		RPS	Before the Semester Starts	Lecturer
Implementation	Implementation of Lectures	SIAKAD	Absence	Current Semester	Lecturers and Cadets
	Implementation of Mid-Semester Exams		Exam Documents	Current Semester	Academic and Cadet Administration Section
	Implementation of Final Semester Exams		Exam Documents	Current Semester	Academic and Cadet Administration Section
Monitoring	Monitoring Attendance and Fulfillment of Lectures	SIAKAD	Lecture Journal	Current Semester	Academic and Cadet Administration Section
Evaluation	Determination of semester grades	SIAKAD	Score list	End of Semester	Academic and Cadet Administration Section
	Lecturer Evaluation	SIAKAD	Assessment Form	End of Semester	SPM



Education Management System

Description:
The ICT System is evaluated annually to improve the flow, process, and troubleshoot the problems during the event, such as networking, login faults, and additional users to manage the system. The evaluation program involves the developer company.

The PPI Smart Campus website is available at the link:
https://smartcampus.exprodi.co.id/