

PERTAMINA INITIATIVES TO REDUCE GREENHOUSE GAS EMISSIONS

TP. Pasaribu
HSSE – PT. Pertamina (Persero)





GHG Emission reduction INITIATIVES

- Management Commitment
- Green house gas emission profile
- Energy management in operation activities
- Commitment to develop low carbon technologies
- Employee & Community Involvement
- Energy Consumption and GHG Emission Reporting & Monitoring

MANAGEMENT COMMITMENT

1. Vision & Mission :

2. Environment Policy

- Commitment to Support Better Environmental Quality : Climate Change, Energy Efficiency, Clean Air, Waste Management, Water Resources Community Development, Biodiversity

3. Emission Reduction Percentage as one of Key Performance Indicators (KPI) of CEO & BOD

- ERP become KPI of all operation director (Upstream, Refining, Marketing)
- ERP KPI cascaded up to operational level (GM & Manager)

4. Pertamina GHG Emission Reduction Roadmap 2010 – 2020

5. Pertamina Sobat Bumi as Corporate Brand Image

VISION - MISSION

To Be World Class National Energy Company.

To carry out integrated business core in oil, gas, renewable and new energy based on strong commercial principles.

Kontrak Manajemen Tahun 2011

Strategic / Inisiatif Strategik	RKAP 2011 20.00 T	BOBOT %
OPM 8. a. Emission Reduction	0.07 % Reduction	2.00
b. Energy Efficiency Improvement	5.00 % Reduction	2.00
OPM 9. Number of Major Oil Spill	0 Jumlah Insiden	2.00

Daftar Shared KPI untuk Tahun 2012

No	KPI shared 2012 (di Other Operational Metrics)	Direksi & Fungsi Leher	SVP	VP	Penanggung Jawab	Base Target
1	Learning days	✓	✓	✓	Dit. SDM	6.5 hari
2	Tindak lanjut temuan audit internal & eksternal	✓	✓	✓	SPI	80%
3	Knowledge sharing	✓	✓	✓	Dit. Umum	10%
4	Emission reduction * untuk Dit. HSE, Pengolahan dan P&N saja	✓	✓ (1)	✓ (1)	Dit. Umum	3%
5	Energy efficiency * untuk Dit. Pengolahan dan P&N saja	✓	✓ (1)	✓ (1)	Dit. Umum	7.5%
6	Utilisasi ERP (MySAP)			✓ (2)	Dit. Umum	97%
7	Penyusunan rancangan RKAP 2012			✓ (2)	Dit. Keuangan	180 hari
8	Ketepatan Manajemen Kinerja			✓ (2)	Dit. PIMR / Dit. SDM	95%

(1) Hanya diturunkan untuk SVP atau VP yang terkait

(2) Hanya untuk VP yang ditunjuk untuk memonitor pengelolaan KPI shared terkait di masing masing Direktorat atau Fungsi



Quality



KEBIJAKAN MANAJEMEN

Penerapan Perbaikan Berkelanjutan Untuk Kualitas Lingkungan Hidup Yang Lebih Baik

Bisnis perusahaan harus *sustained*. Untuk bisa *sustained*, maka keseimbangan antar aspek ekonomi, sosial dan lingkungan harus sejalan. Di dalam pencapaian target-target kinerja Pertamina, upaya pengelolaan lingkungan juga harus terintegrasi dan terencana dari awal. Melalui bisnis dan produk kami, kami ingin menciptakan masa depan yang lebih baik bagi semua orang : bagi orang-orang yang bekerja untuk kami, mereka yang berbisnis dengan kami, mereka yang menggunakan produk kami, dan generasi mendatang dengan kualitas kehidupan yang bergantung pada cara kami mengelola lingkungan saat ini.

Pertamina dan Dampak Perubahan Iklim

Pertamina menyadari bahwa perubahan iklim global merupakan tanggung jawab semua pihak, dan oleh karena itu Pertamina ikut berupaya untuk memberikan kontribusi dalam pencegahan perubahan iklim melalui program pengendalian emisi gas rumah kaca yang dilakukan secara berkesinambungan. Hal ini dimulai dengan inventarisasi sumber emisi, perhitungan serta pelaporan beban emisi gas rumah kaca secara berkala. Pertamina terus mengupayakan pengendalian emisi gas rumah kaca melalui pemilihan teknologi operasi yang ramah lingkungan, upaya konservasi energi dan sumber daya alam, mengembangkan penggunaan energi baru dan terbarukan, serta mendukung program Mekanisme Pembangunan Bersih (*Clean Development Mechanism*). Pertamina juga terus berupaya untuk menghasilkan produk - produk ramah lingkungan sebagai kontribusi untuk menciptakan lingkungan yang lebih bersih.

Pengelolaan Udara Bersih

Pertamina terus berupaya untuk mengurangi emisi yang berasal dari kegiatan operasional dan kegiatan penunjang lainnya yang dapat menurunkan kualitas udara dan lingkungan. Setiap proyek yang akan dibangun akan melalui kajian memastikan emisi udara yang dihasilkan akan memenuhi baku mutu yang ditetapkan. Kualitas udara akan terus dijaga melalui pengukuran dan pemantauan emisi dan ambien secara berkala.

Manajemen Energi

Sebagai bagian dari program konservasi energi, Pertamina terus berupaya mengurangi konsumsi energi dalam kegiatan operasional maupun kegiatan pendukungnya dengan menerapkan teknologi dan peralatan dengan konsumsi energi rendah dan melakukan *improvement* agar konsumsi energi dapat seefisien dan seoptimal mungkin. Budaya hemat energi harus menjadi budaya yang melekat bagi seluruh pekerja. Audit energi dilakukan secara berkala untuk mengidentifikasi potensi pemborosan energi dan mencari peluang untuk menggunakan energi lebih efisien.



Pengelolaan Limbah B3 dan Limbah Padat

Untuk menjaga kelestarian lingkungan, Pertamina terus berupaya untuk mengurangi limbah B3 (Bahan Berbahaya dan Beracun) dan non B3 yang dihasilkan dari kegiatannya. Upaya ini dilakukan dengan mengurangi limbah dari sumbernya, kemudian mendaur-ulang atau mendaur-ulang kembali jika memungkinkan sebagai upaya untuk mengurangi dampak lingkungan. Setiap sisa limbah yang akan dibuang akan dikelola dan diperlakukan sesuai dengan peraturan yang ada.

Profit

Environment

SUSTAINABLE BUSINESS

Community

daya air di lingkungan sekitar operasi perusahaan, kami menjaga keseimbangan ekosistem perairan. Setiap air limbah yang dihasilkan kami pertahankan memenuhi baku mutu yang telah ditetapkan. Pemanfaatan air limbah kami lakukan untuk menjaga keseimbangan ekosistem. Kami terus berupaya menjaga keseimbangan ekosistem dengan melakukan tindakan pencegahan untuk mencegah pencemaran air melalui pemantauan kualitas air limbah dan air hujan serta pemeliharaan saluran air. Kami terus berupaya menekankan pemantauan kualitas air dengan melakukan berbagai kajian untuk memastikan kualitas air.

Upaya Perlindungan Keanekaragaman Hayati

Pertamina terus berupaya untuk melindungi keanekaragaman hayati dalam setiap kegiatan operasi. Kami terus berupaya menjaga keanekaragaman hayati dengan melakukan pemantauan keanekaragaman hayati dengan menggunakan metode yang sesuai, khususnya pada area sensitif; pencegahan pencemaran keanekaragaman hayati sepanjang siklus bisnis; pemantauan keanekaragaman hayati, serta merencanakan dan memodifikasi kegiatan operasi untuk melindungi spesies flora dan fauna tertentu yang ada di dalam daerah operasi kami.

Hubungan dengan Masyarakat

Kami memandang bahwa menjadi bagian dari masyarakat yang lebih besar dimana masyarakat dan perusahaan berada dalam kesetaraan merupakan hal yang amat penting. Tujuan kami adalah terjalin hubungan yang harmonis antara perusahaan dan masyarakat sekitar, serta masyarakat sekitar dapat merasakan manfaat dari keberadaan kami. Untuk itu kami mendukung program pemberdayaan masyarakat sekitar dengan potensi masyarakat sekitar sesuai dengan kapasitasnya.

Jakarta, 9 September 2011

President Director & CEO,

Karen Agustiawan

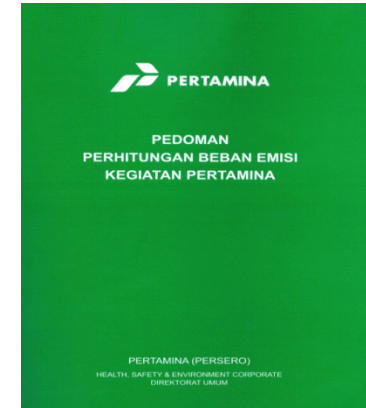


GREENHOUSE GAS EMISSION calculation

1. Emission Inventory :


Identify the sources of GHG Emission (Direct Emission)

No.	Emission Source	PEP	PHE*	Pertagas	PGE	Refining	M&T
1	Internal Combustion	√	√	√	√	√	√
2	External Combustion	√	√	-	-	√	-
3	Flaring	√	√	√	-	√	-
4	Incinerator		√	-	-	-	-
5	Sulphur Recovery Unit	√	-	-	-	√	-
6	Residual Catalytic Cracking Unit	-	-	-	-	√	-
7	Co2 Removal	√	-	-	-	-	-
8	Power Plant	-	√	-	√	-	-
9	Fugitive Emission (piping)	√	√	√	-	√	√
10	Storage Tanks	√	√	-	√	√	√
11	Loading/Unloading Marine	√	√	-	-	√	√
12	Loading Tank Truck & RTW	√	-	-	-	-	√
13	Waste Water Treatment	√	-	-	-	√	-



2. GHG Emission Calculation

- Collaborated with IPA to formulate GHG Calculation Method
- Establish the formula to calculate GHG Emission Reduction from each source : methodology, level of tier, parameter and emission factor → Pedoman Perhitungan Beban Emisi Kegiatan Pertamina
- Software for Calculating GHG emission
- Training & Capability Building

Navigasi	Depan <<Prev
	
PERHITUNGAN BEBAN EMISI KEGIATAN OPERASI PT PERTAMINA	
Unit kegiatan Operasi	Refining
Lokasi Kegiatan	Refinery Unit I
Bagian / Fasilitas / Unit	Pembakaran Dalam dan Pembakaran Luar
Peralatan	
Lokasi Peralatan	
Kode Unit / Alat	
TIER 3a	
Perhitungan Beban Emisi untuk Unit Pembakaran Dalam dan Unit Pembakaran Luar	Perhitungan beban emisi berdasarkan pada perhitungan atau metering pada level fasilitas dengan menggunakan faktor Emisi (EF) : dari OGP Report (equipment based)
Metering Fuel Consumption (FC)	
Natural Gas (raw)	
Fuel Type	gas
Phase	gas
Typical density	0.042 lb/cuft
Metering Fuel =	10335632 m3/tahun
	6947.03146 ton fuel/tahun
Emission Factor (EF) OGP Report	
Gas combustion	
Equipment Factor Engines factor	
EF,CO ₂ =	2.75 ton CO ₂ /ton fuel
EF,CH ₄ =	0.028 ton CH ₄ /ton fuel
EF,N ₂ O =	0.00022 ton N ₂ O/ton fuel
EF,SO _x =	0.0000128 ton SO _x /ton fuel
EF,NO _x =	0.076 ton NO _x /ton fuel
EF,PM =	0 ton PM/ton fuel
Beban Emisi E_i (Ton i / tahun)	
Beban Emisi	
CO ₂	19104.337 ton/tahun
CH ₄	194.5169 ton/tahun
N ₂ O	1.5283 ton/tahun
SO _x	0.0889 ton/tahun
NO _x	527.9744 ton/tahun



Training And Socialization to Enhance Workers Competencies (1)

Energi Conservation & Audit Training (3 days)

- Purpose : To provide knowledge to identify sources of energy inefficiency and opportunities for improvement in Refining, oil field, fuel terminal
- Participants : Operator & Supervisor Level (Operation Department, HSSE, Eng)
- 4- 6 Class per year (since 2010)
- The number of workers who have received training : ± 250 employees

Hari ke 1

No	Waktu	Judul Materi
1	07.30 - 08.00	Registrasi Peserta
2	08.00 - 08.45	Pembukaan Kebijakan & Strategi Pertamina Dalam Konservasi Energy
3	08.45 - 09.30	Evaluasi (Pre Test)
4	09.30 - 09.45	Rehat
5	09.45 - 10.30	Managemen Energi
6	10.30 - 11.15	Managemen Energi
7	11.15 - 12.00	Akutansi Energi dan Pelaporan
8	12.00 - 13.00	ISHOMA
9	13.00 - 13.45	Teknik Audit Energi dan Instrumentasi
10	13.45 - 14.30	Teknik Audit Energi dan Instrumentasi
11	14.30 - 14.45	Rehat
12	14.45 - 15.30	Konservasi Energi pada Pompa dan Kompresor
13	15.30 - 16.15	Konservasi Energi pada Pompa dan Kompresor

Hari ke 2

No	Waktu	Judul Materi
1	08.00 - 08.45	Konservasi Energi pada Sistem Kelistrikan dan Motor Listrik
2	08.45 - 09.30	Konservasi Energi pada Sistem Kelistrikan dan Motor Listrik
3	09.30 - 09.45	Rehat
4	09.45 - 10.30	Konservasi Energi pada Sistem Pendingin
6	10.30 - 11.15	Konservasi Energi pada Sistem Pendingin
7	11.15 - 12.00	Konservasi Energi pada Diesel & Gas Engine Generator System
8	12.00 - 13.00	ISHOMA
9	13.00 - 13.45	Konservasi Energi pada Sistem Pencahayaan
10	13.45 - 14.30	Konservasi Energi Pada Sistem Pencahayaan
11	14.30 - 14.45	Rehat
12	14.45 - 15.30	Konservasi Energi pada Boiler dan Sistem Distribusi Uap
13	15.30 - 16.15	Konservasi Energi pada Boiler dan Sistem Distribusi Uap

Hari ke 3

No	Waktu	Judul Materi
1	08.00 - 08.45	Tekno Ekonomi Potensi Penghematan Energi
2	08.45 - 09.30	Pengantar Praktek Lapangan
3	09.30 - 09.45	Rehat
4	09.45 - 10.30	Praktek Lapangan
6	10.30 - 11.15	Praktek Lapangan
7	11.15 - 12.00	Praktek Lapangan
8	12.00 - 13.00	ISHOMA
9	13.00 - 13.45	Penyusunan Laporan Praktek
10	13.45 - 14.30	Penyusunan Laporan Praktek
11	14.30 - 14.45	Rehat
12	14.45 - 15.30	Presentasi Hasil Praktek
13	15.30 - 16.00	Evaluasi (Post Test)
14	16.00 - 16.15	Penutupan

Training And Socialization to Enhance Workers Competencies (2)

Emission Calculation Training (3 days)

- Purpose : To provide knowledge to calculate the amount of GHG emission from each operation/business unit in Refining, oil field, fuel terminal
- Participants : Supervisor , Analyst & Middle Management Level (HSSE, Eng)
- 1- 2 Class per year (2010)
- The number of workers who have received training : \pm 50 employees
- Training syllabus tailored to each emission source directorate / business unit

Training for Marketing & Trading Unit Business :

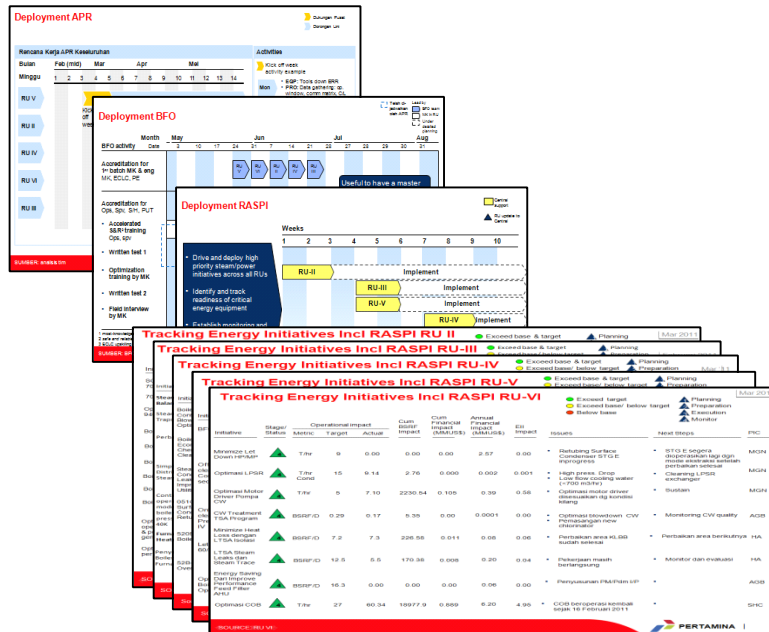
Waktu (WIB)	Acara / Topik Pembahasan	Pembicara/PIC
08.00 – 08.30	Registrasi	Panitia
08.30 – 08.35	Safety Briefing	Panitia
08.35 – 08.45	Pembukaan	Man HSE M&T Business Support (Masjuli)
08.45 – 09.00	Pengarahan	Manager Env. HSE Corp (TP Pasaribu)
09.00 – 10.00	Perhitungan Fugitive Emission	Peserta + Nara Sumber
10.00 – 10.15	Istirahat	
10.15 – 11.45	Perhitungan Kegiatan Tanki Timbun	Peserta + Nara Sumber
11.45 – 12.45	Ishoma	
12.45 – 14.15	Perhitungan Kegiatan Loading/unloading Marine	Peserta + Nara Sumber
14.15 – 14.30	Istirahat	
14.30 – 16.00	Perhitungan Proses Pembakaran	Peserta + Nara Sumber

Waktu (WIB)	Acara / Topik Pembahasan	Pembicara/PIC
08.00 – 10.00	Perhitungan Kegiatan Loading Mobil Tanki dan RTW	Peserta + Nara Sumber
10.00 – 10.15	Istirahat	
10.15 – 11.45	Kompilasi data / Review	Peserta + Nara Sumber
11.45 – 13.30	Ishoma	
13.30 – 14.30	Perumusan Hasil Workshop	Panitia
14.30 – 14.45	Penutupan	Man HSE M&T Business Support (Masjuli)

Training And Socialization to Enhance Workers Competencies (3)

Energy Efficiency Index (EEI) Workshop

- Purpose : evaluation of energy consumption in refineries, discussion issues of energy consumption trends and its solutions, monitoring and reporting energy consumption
- Participants : Energy Conservation & Loss Control Dept (Refinery Unit) and Refining Technology Dept (Head Office)
- Every 3 Months



Refining Technology (head office) make the basic concept of integrated deployment program.

Implementation in each RUS performed using the approach or method that allows scrolling pull forward to the learning process



SUPPORT FROM WORKERS – Environmental Awareness Culture

PAPERLESS OFFICE

- Application of E-correspondence: the system correspondence (memos, etc.) through an intranet network
- Use of information on the Intranet: pricelist, internal announcements, company magazine, etc. via the intranet
- E-auction: a bidding process through an intranet network
- Digital Library: ordering and return library books over the network
- Pay slips via email



CLEAN AIR

- Smoking ban in buildings and offices to support the healthy and clean work environment, and comply the Governor regulation No. 88 / 2010
- Emissions testing of motor vehicles owned by employees and partners in Pertamina Office
- Bike to Work : Special parking for bikers

ENERGY SAVING

- Turning off lights when leaving the room
- Utilization of solar light for illumination
- Energy-efficient electrical appliances
- Turn off your computer (not standby)
- LCD with low carbon emission
- E-book



We use all media to broadcast our message ...
to encourage the employees.. to inform the result



Internal magazine



Intranet broadcast



Booklet



Participating in Global Earth Hour Carbon Footprint Calculation



Circular letters from BOD



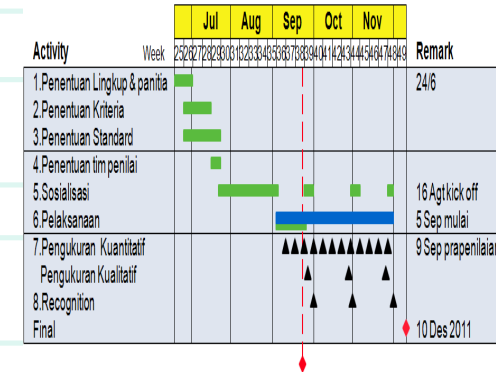
Videoconference with BOE



Employee Participation

Energy Saving Competition in Refinery Unit by ECLC Dept.

Activities	Deliverables	PIC	When	Status
Rapat koordianasi workplan	Decision & report	ECLC	24 Juni 2011	OK
Rapat penentuan kriteria, standard, pembentukan tim	Report	ECLC	Juli 2011	OK
Rapat persiapan Kick off	Resume and report	ECLC & tim		OK
Kick Off	Sosialisasi	ELCL & Team	16 Agustus 2011	OK
Ujicoba penilaian di Diswax	Kalibrasi penilaian	Team penilaian	9-Sep	OK
Penilaian I	Best performance 1 st month	Team penilai	24-28 Sep	OK
Sosialisasi hasil penilaian	Pemberian hadiah bulanan	Team sosialisasi	1 st week Okt	In progress



Water and Energy Efficiency Campaign for Workers Family



Bike to Work Community

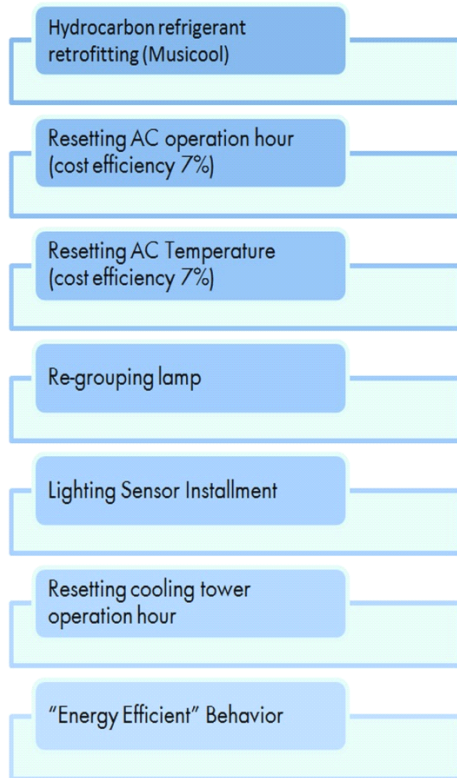


Inspection of water and electricity usage at home office



Not only in our operations, but also in our office buildings..

ENERGY EFFICIENCY in Office Area



Pertamina is targeting the reduction of office energy consumption to 2.83 million KWH in 2011 (5% from the 2011's consumption)

Energy audit in 2010 show the "Energy Consumption Index / ECI" = 213 KWH/m²/year (above ASEAN's ECI = 200 KWH/m²/year)

Some initiative programs have reduced energy consumption to 2,537,192 KWH (4.48%) until August 2011

Retrofitting with Hydrocarbon Refrigerant has reduced 20-25% of energy consumption

Energy efficiency in Pertamina Head Office :

- Cost reduction : Rp. 760 million/year
- GHG emission reduction : 884 tons CO₂e/year

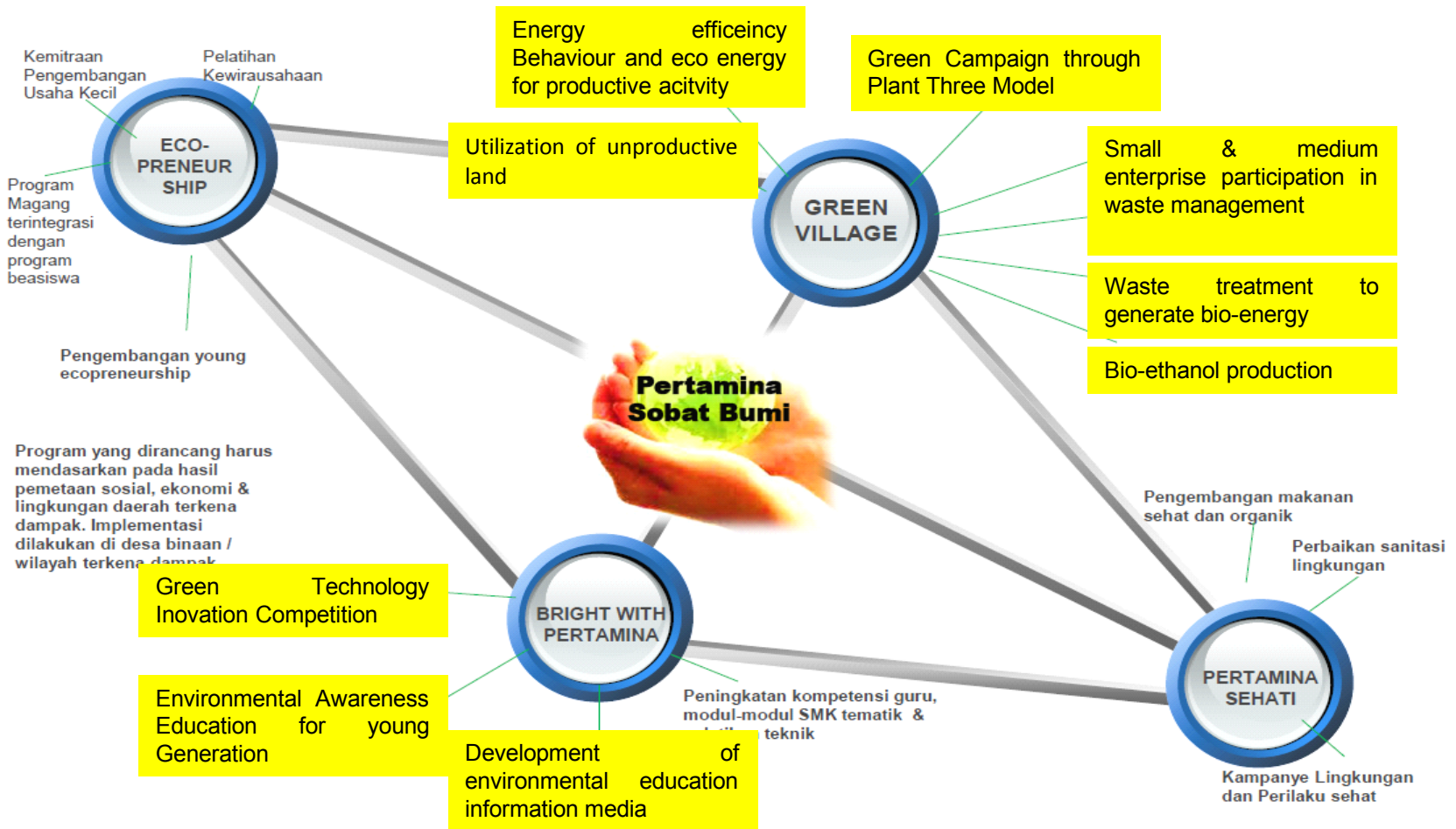


PROGRAM EFISIENSI ENERGI GEDUNG

	Th 2011	Th 2012	Th 2013
AC	<ul style="list-style-type: none"> Perubahan jam operasi Perubahan setting temperatur Perbaikan sistem perawatan Penggantian freon ke Hydrocarbon refrigerant Perbaikan sistem sirkulasi air pada cooling tower 	<ul style="list-style-type: none"> Penyempurnaan ducting fresh air dan return air Pemasangan BAS (Building Automation System) 	
LIGHTING	<ul style="list-style-type: none"> Perubahan jam operasi Penyempurnaan grouping Pemasangan occupancy sensor Pemasangan day light sensor Pemasangan lampu T-S & LED 	<ul style="list-style-type: none"> Penggantian lampu T-S & LED Pemasangan occp & day light sensor Pemasangan BAS 	<ul style="list-style-type: none"> Penggantian lampu T-S & LED Pemasangan occp & day light sensor
POWER	<ul style="list-style-type: none"> Penambahan Capacitor Bank 		<ul style="list-style-type: none"> Pemasangan intelligent power/voltage optimisation
UTILITY		<ul style="list-style-type: none"> Pemasangan BAS 	

Community Involvement & Development

Corporate Social Responsibility Issue in 2011 - 2015



Community Involvement

- PROGRAM miniature “ Climate Village ‘ is a program that involves active participation of society in adapting to and mitigating climate change in an integrated manner taking into account local knowledge. program includes a series of planning activities, socialization, facilitation, monitoring, evaluation, and assessment of climate villages.
- The program is implemented in the village Kutowarjo Cilacap.
- Program : Organic Farming, Installation of Biogas, Ecotourisme, reforestration of mangrove forests (20 ha)



Biogas terbuat dari fiber



Mini pilot biogas ex biomassa



Pupuk dan Beras organik



Penanaman mangrove dan peternakan kepiting

Program Desa Binaan (Village Patronage) Tambaklorok Ex. Golden Horn, the city of Semarang.

Programs that have been implemented include:

Environment;

- Environmental Management Using Tabulampot
- Improved Cage Duck

Infrastructure

- Development of Smart Houses, early childhood and IHC
- Elevation of Settlement Pond Environmental Way Lorok
- Construction of Gate Sign Kawas

Economics:

- Increased production through the cultivation of a duck egg laying
- Management of post-harvest eggs with salted egg making training
- Increased Productivity and Quality in Small Industries Paste
- Establishment of Joint Business Group Animal Duck

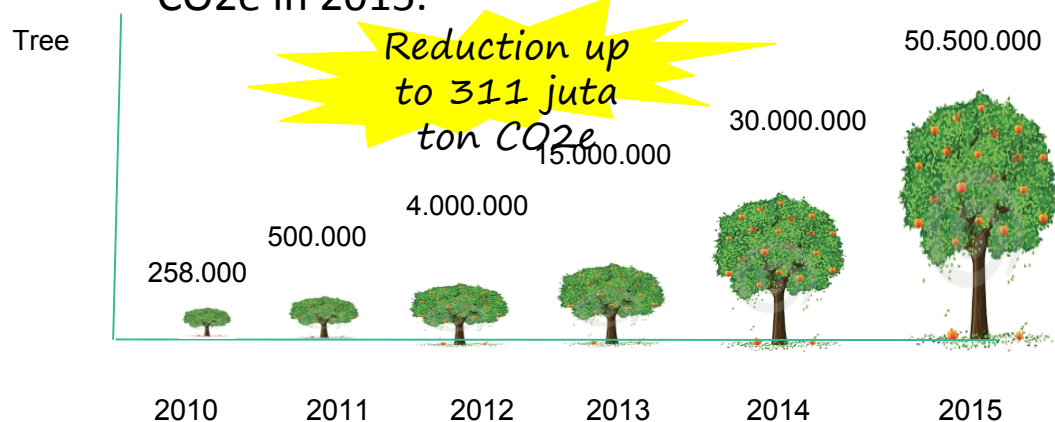
Education

- Training and Support Facility for early childhood
- Infrastructure for Smart Houses
- Entrepreneurial Management Education Duck



SAVING 100 MILLION TREES PROGRAM

- "Saving 100 Million Trees" program is a form of company's commitment to success government programs 'Planting 1 Billion Trees'.
- Pertamina has targeted planting 100 million trees over the next five years, from 2011 to 2015.
- In 2011 Pertamina has planted 1 million trees, and in 2012 is planned to plant 4 million trees. Planting 100 million trees will be conducted in all regions of Indonesia, which projected is expected to absorb up to 311 million tonnes of CO₂e in 2015.

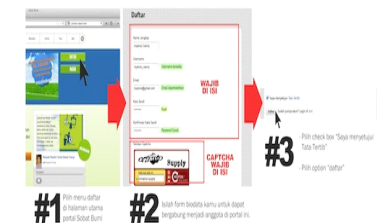


INA

Renewable Spirit

2. SEKOLAH SOBAT BUMI (SCHOOL OF EARTH FRIENDS PROGRAM)

- Sekolah Sobat Bumi (School of Earth Friends) was initiated by Pertamina to support government targets in the environmental aspect to reduce greenhouse gas emissions by creating environmental friendly school model in Indonesia. The program had a top target for the formation of character children school through four topics flagship program :
 - practices in small-scale use of renewable energy and fossil energy use efficiency.
 - waste management school,
 - cafeteria and school environment as well as planting trees,
 - efforts of maximizing use of environmentally friendly transport
- Those Green schools then get assistance to carry out four projects in education for sustainable development. In addition, the school is also required to share their knowledge and competence to other 10 schools, so the number of environmental friendly school become larger and spreading.
- It is designed to encourage public awareness, especially education, to develop and implement eco-character of everyday life.
- This program collaborates with Task Force on Reducing Emissions from Deforestation and Forest Degradation Plus (Task Force of REDD +). Task Force of REDD + is formed as a transformation of the Letter of Intent which is signed by Indonesian Government and Norway Government in May 2010 in Oslo, Norway .

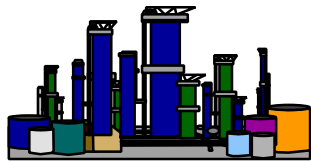


GREEN HOUSE GAS EMISSION PROFILE

Exploration & Production



Refining



Marketing & Trading



2010

0.63%
1.47%
2.02%
3.25%
3.33%

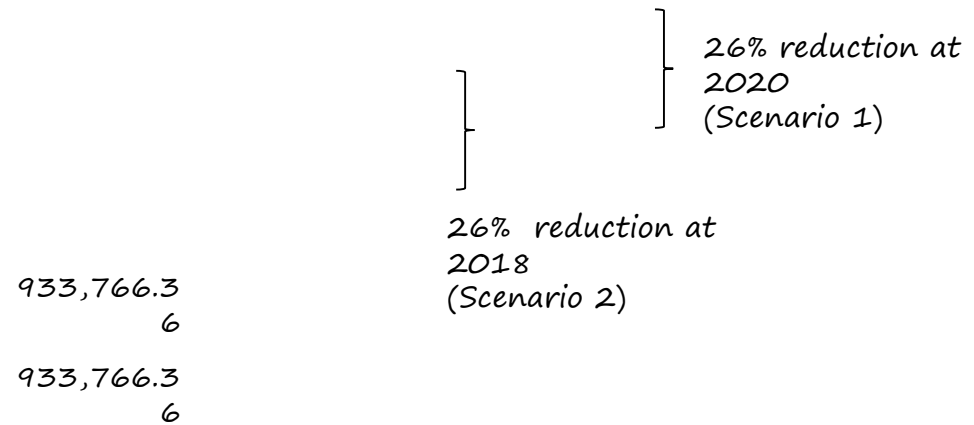
0.45%
0.00%
0.00%
2.84%

Suar Bakar (Flaring)
Pembakaran dalam dan luar
Fugitive Emission
Tangki Timbun
Fluidized Catalytic Cracking
Residual Catalytic Cracking
Loading Truck/Rail/Marine
Glycol Dehydrator
Waste Water Treatment
Unit Penangkap Sulfur
Insinerator Gas Kecut
CO2 Removal

2011

National GHG Emission with BaU scenario at 2010 is 420 Gtonnes CO₂e (ref. Second National Communication, 2009). Pertamina contributions to National GHG Emission in 2010 is **0.006 % CO₂e**

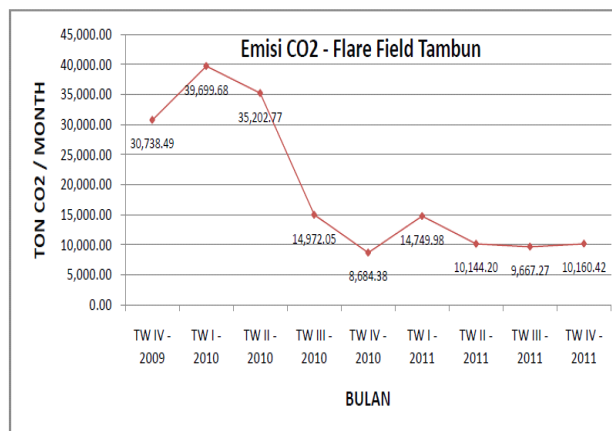
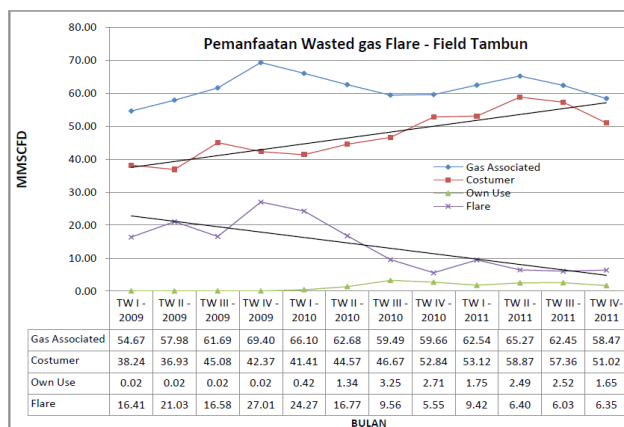
PERTAMINA GHG EMISSION REDUCTION ROAD MAP 2010 – 2020 (ton CO2e/year)



Pertamina has reduced GHG emission up to 933.766 ton CO2 until mid 2012 from direct sources

1. Zero Flaring Initiatives

Utilization of gas flaring in Field Tambun - Subang as raw material for LPG and CNG in PLN Muara Tawar (Zero Flaring Program). This initiatives reduce gas flaring volume up tp 70%- **Emission Reduction of GHG 147.652 Tonnes Co2e/year**



No.	Other Gas Flaring Reduction Initiatives	GHG Reduction (ton/yr)
1	The use of ex flare gas to feed SKG3 GNK Compressor of 13.42 MMSFD – Field Prabumulih	39.000
2	The use of gas emission as fuel for boiler steam generator to SPU Sei.Karas	1.589
3	Purchasing and Selling Agreement on gas Gas at Mudi Field - PPEJ to PT Gasuma Corp	168.000
4	HSD substitution to gas at 3 unit generator at SP Cilamaya	869
5	Utilization of Waste gas Compressor at RU IV Cilacap	11.800



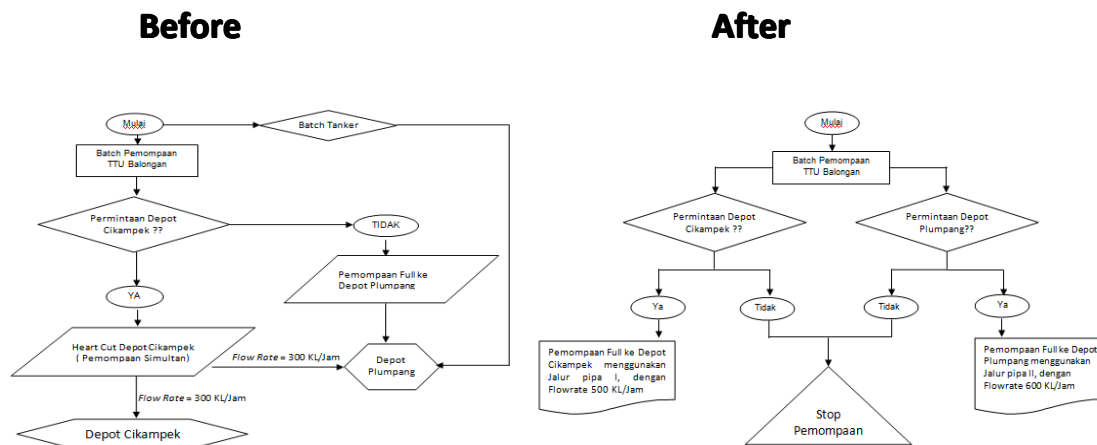
2. Utilization of CO₂ from CO₂ Removal Plant in Field Cilamaya

- Located in Karawang - West Java
- Established in 2000
- Designed to reduce CO₂ content in feed hydrocarbon gases by 40% to 5% → CO₂ extracted 2.5 MMSCFD
- In 2010 :
 - The extracted gas: 856.71 MMSCF (2010)
sent to PT. Samator: 518.05 MMSCF (2010) → equal to
28.271 Tonnes CO₂ reduction per year

-

4. The Conversion of Fuel Transport Method from Tanker to The Pipeline System

The project was built to improve the efficiency and reliability of fuel supply from Balongan Fuel Terminal to Cikampek and Plumpang Fuel Terminal. Previously performed utilizing tanker transportation. The conversion of fuel transport method is made to ensure the security of supply continuity at the Plumpang and Cikampek and to reduce tanker fee. This project contribute emission reduction up to 35.299 tonnes CO₂e per year.



Commitment To Produce Clean & Low Carbon E

Initiatives :

GHG Reduction*

<p>Produce gasoline with higher octane number & lower carbon emission (Pertamax, Pertamax plus etc)</p>	
<p>Develop LPG (brand ViGas) and CNG (brand BBG) as transportation fuel</p>	60.1 Ton/yr
<p>Biofuel (BioPremium, BioSolar, BioPertamax) to reduce dependence on fossil fuel</p>	2,9 M Ton/yr
<p>Produce eco-friendly products : MUSICool hydrocarbon refrigerant to substitute freon, beside reducing energy consumption</p>	0.51 M Ton/yr
<p>Kerosene conversion to LPG 3 kg program for household & others public requirements</p>	7,84 M Ton/yr
<p>Accelerates the development of Geothermal Power Generation Projects.</p>	0.171- 0.628 M Ton/yr
<p>Commitment to develop new and renew energy</p>	



*based on consumption in 2011

NEW & RENEWABLE ENERGY

A vision to move forward Pertamina into a green energy Company @2020 – the pride of the Nation. An objective of 25% of Pertamina energy supply will come from New & Renewable Energy @2020, ramp up -more important- toward the future.

COAL-BED METHANE

- Indonesia potential 435 TCFG, eq. 160 BBOE
- Starting 6 PSC @2008-2010
- Pertamina 2012 at field development stages and start production CBM for electricity
- First gas 2012, ramp up to 80 MMCFGD @2016

SHALE GAS, LOW-PERM RESERVOIR

- Indonesia speculative resources of 4,983 TCFG, based on preliminary study of HIS CERA
- Pertamina 2011 : potential area identification & technology capture (pre-project)
- Pertamina 2012 : first Shale Gas PSC

WIND ENERGY

- Indonesia potential 9.3 GW
- 2011-further: Cooperation with P3TKEBTKE/ESDM & OTHERS
- 20 MW electricity from wind power by 2015

MICRO-ALGAE, GAS HYDRATES, HYDROGEN(?)SOLAR THERMAL(?)

- Pertamina 2011: organization set-up, pre-project evaluation & technology capture
- Cooperation with P3TKEBTKE/ESDM & OTHERS
 - 2012: area screening & feasibility studies
 - 2012-further: pilot project to commerciality

Conclusion

Pertamina roles to support national greenhouse gas emission reduction program :

- As energy consumer : energy efficiency initiatives.
- As energy produces : eco friendly product and develop low carbon energy (new & renewable energy)
- a corporate citizenship : community involvement in CSR program focus environmental friendly energy
- Cultural trend setter : Energy Efficient Culture

**Pertamina Sobat Bumi, menghijaukan negeri
bagi kelangsungan generasi**

**Thank
you..**

