



INDUSTRIAL
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Industrial Energy Accelerator INDONESIA Diagnostic



About the Industrial Energy Accelerator

In partnership with key government agencies and industry stakeholders, the Industrial Energy Accelerator works on the ground to rally government, industry and finance around solutions that ignite change in industries. We then take our knowledge and experience to the world, sharing what we have learned to inspire a global movement for industrial energy efficiency. We currently operate in Indonesia, China, Mexico, Brazil and Morocco, five major industrial countries responsible for around 26% of the world's energy consumption.

To learn more visit our web: www.industrialenergyaccelerator.org

Authors

Fabby Tumiwa

Executive Director, Institute
for Essential Services Reform
fabby@iesr.or.id

Erina Mursanti

Senior Researcher, Institute
for Essential Services Reform
erina@iesr.or.id

Kate Hooper

Analyst, The Carbon Trust
Kate.hooper@carbontrust.com

Alessandro Casoli

Senior Manager, The Carbon Trust
Alessandro.casoli@carbontrust.com

Chris Stephens

Director (Asia), The Carbon Trust
Alessandro.casoli@carbontrust.com

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Industry drives economic growth in Indonesia, contributing 41% to total GDP in 2016. Yet it is also responsible for around 40% of Indonesia's emissions in 2016 (Ministry of Environment and Forestry, 2018).

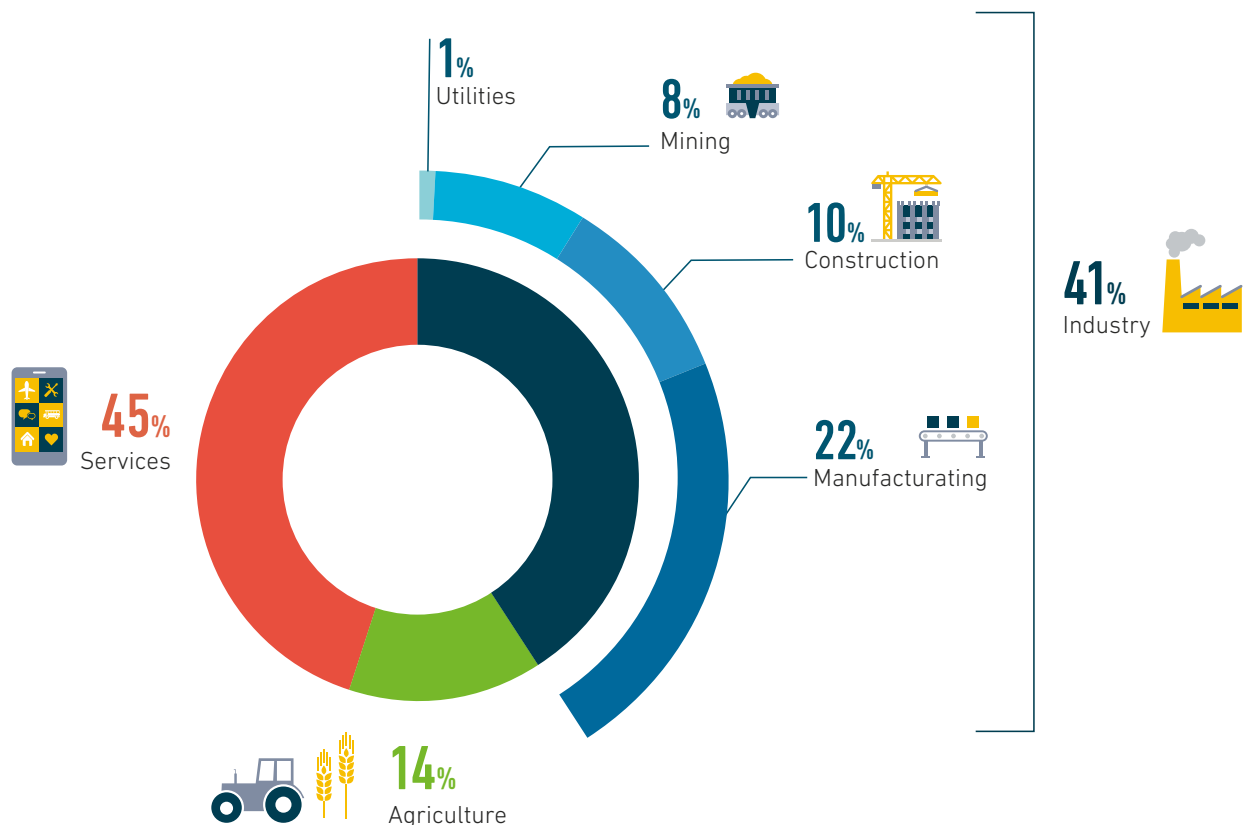


What is the target market?

Economic growth, energy consumption, and GHG in industrial sector

Indonesia, the world's 10th largest economy, and largest in South East Asia, is the world's fifth-largest emitter of greenhouse gases. In the last decade, Indonesia has enjoyed a 5.4 percent increase per year in GDP (World Bank 2018b), and this steep growth has spurred an intensification in CO₂ emissions by 3.9 percent per year.

This growth is expected to continue, with the country's real GDP growth is projected to rise from 5.1 percent in 2017 to 5.2 percent in 2018 (World Bank, 2018a) and the Governor of Bank Indonesia having set a target of 6.2% for 2022 (Martowardojo, 2017).



Data Source: Trading Economics, 2018)

Figure 1. Contribution to GDP by sector in 2016

With this expected economic growth, Indonesia's energy demand is also forecast to increase. The Indonesia National Energy Master Plan (Rencana Umum Energi Nasional (RUEN)) predicts that the final energy demand in 2025 will reach 248.4 MTOE, from 148.1 Mtoe in 2016. It forecasts in 2025, the major energy users will be in industrial sector, consuming approximately 47.7% (Ministry of Energy and Mineral Resources, 2017).

Industry drives economic growth in Indonesia, contributing 41% to total GDP in 2016 (Figure 1). Yet it is also responsible for around 40% of Indonesia's emissions in 2016 (Ministry of Environment and Forestry, 2018). The Government of Indonesia is increasingly concerned with the associated emissions across the sector, and recognises the importance of accelerating the uptake of energy efficiency in industry in order to reduce emissions.

The draft of the National Energy Conservation Master Plan (Rencana Umum Konservasi Energi Nasional (RIKEN)) sets out the government's commitment to reducing emissions through increasing energy efficiency measures, prioritising the following activities in the industrial sector:

- **Energy audits** (Investment Grade Audit or Efficiency Services Company);
- **Energy management implementation** (ISO 50001)
- **Online energy** management reporting system
- **Certification of energy** managers and auditors
- **Enhancing public awareness** of the importance of energy efficiency
- **Pilot/demonstration projects**

The plan estimates the energy conservation potential in industrial sector is between 10%- 30% (Table 1).

TABLE 1. Energy conservation potential to 2025

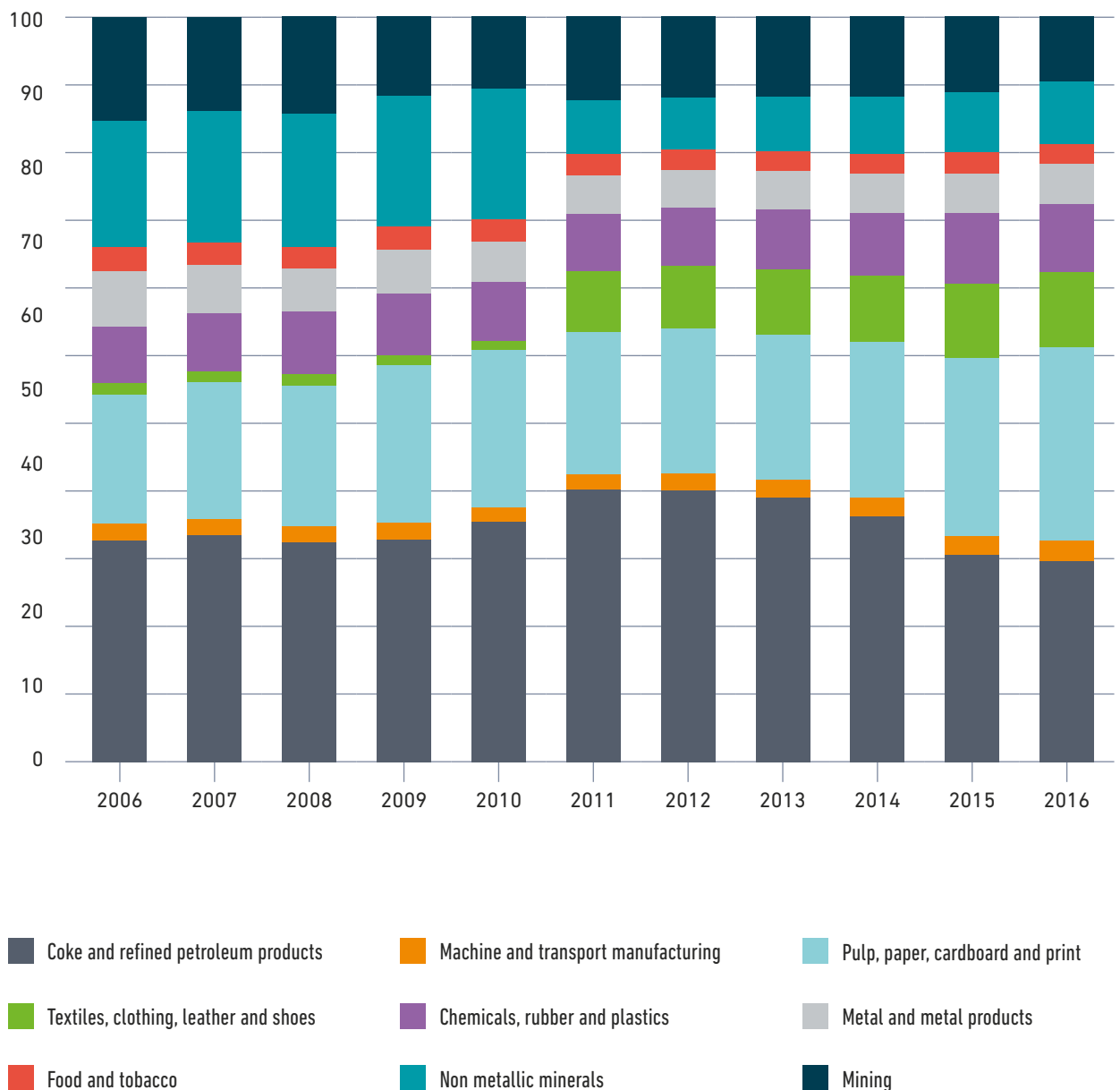
Sector	Energy consumption per sector year 2012 (Million BOE)	Potential of Energy Conservation	Target of Energy Conservation Sectoral (2025)
Industrial	305 (39.7 %)	10 – 30 %	17 %
Transportation	311 (40.4 %)	15 – 35 %	20 %
Household	92 (12 %)	15 – 30 %	15 %
Commercial	34 (4.4 %)	10 – 30 %	15 %
Other (Agricultural, Construction, and Mining)	26 (3.4 %)	25 %	-

Source: Draft of RIKEN in Malik, 2015

Industrial sector mapping

Industrial sub-sectors' contribution to GDP

Over the last 12 years, within industry, mining has contributed the largest share to GDP in Indonesia, followed by food and tobacco (Figure 2). Since 2011, there has been a significant increase in the contribution to GDP by metal and metal products, overtaking machine and transport manufacturing as the two next highest contributing group. Chemicals, rubber and plastics follow, representing the fourth-largest contributing sub-sector group.

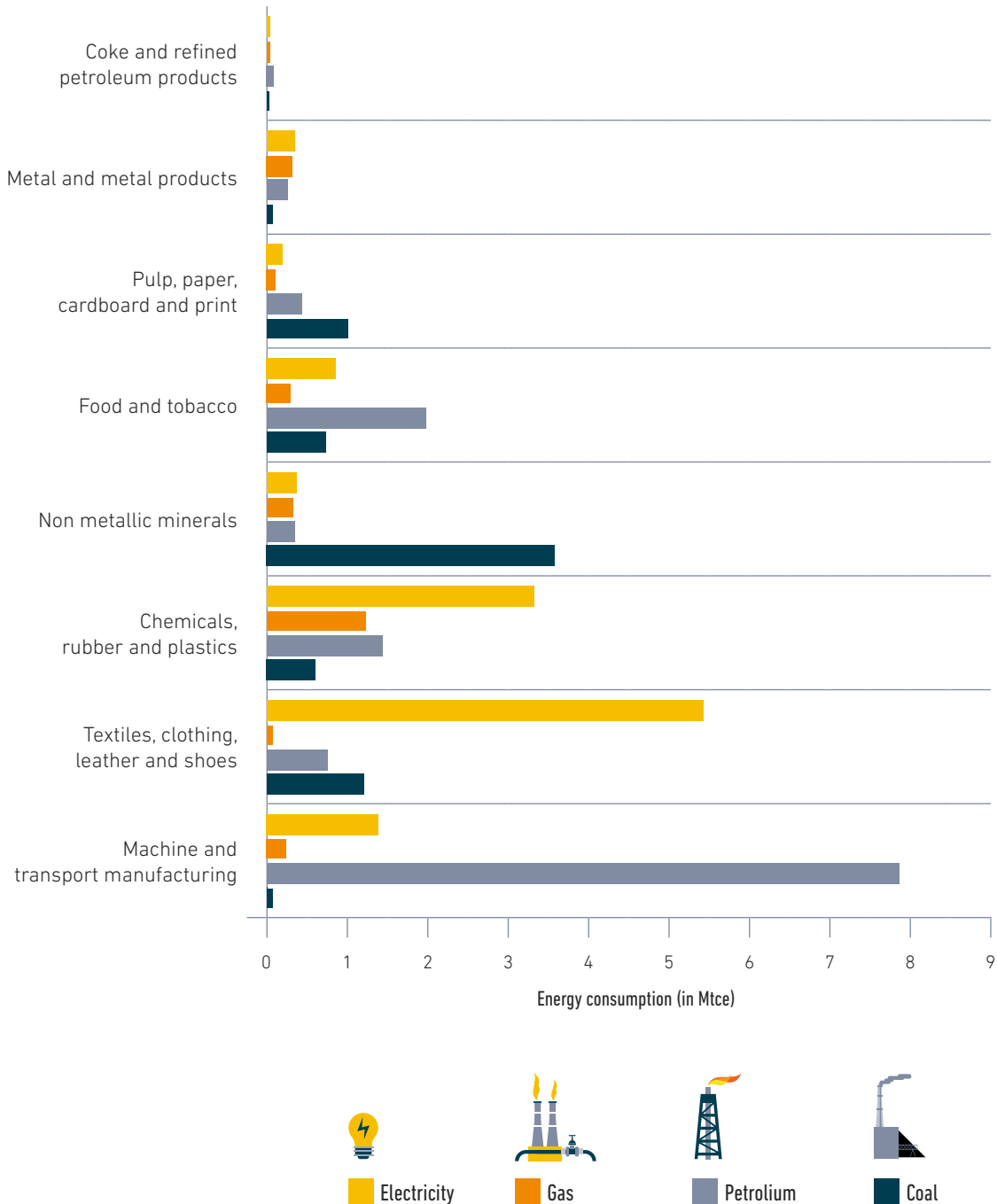


Data source: Statistical Yearbook of Indonesia 2018 in Statistics Indonesia, 2018

Figure 2. Industrial sub-sector contribution to Indonesia GDP in 2006-2016

Industrial sub-sectors' energy demand and energy intensity

Across all the sub-sectors, electricity is the fuel type most consumed. Machine and transport manufacturing is the most energy-intensive sub-sector group (Figure 3). In 2015, textiles, clothing, leather and shoes consumed the most electricity, followed by the chemicals, rubber and plastics sub-sector group.



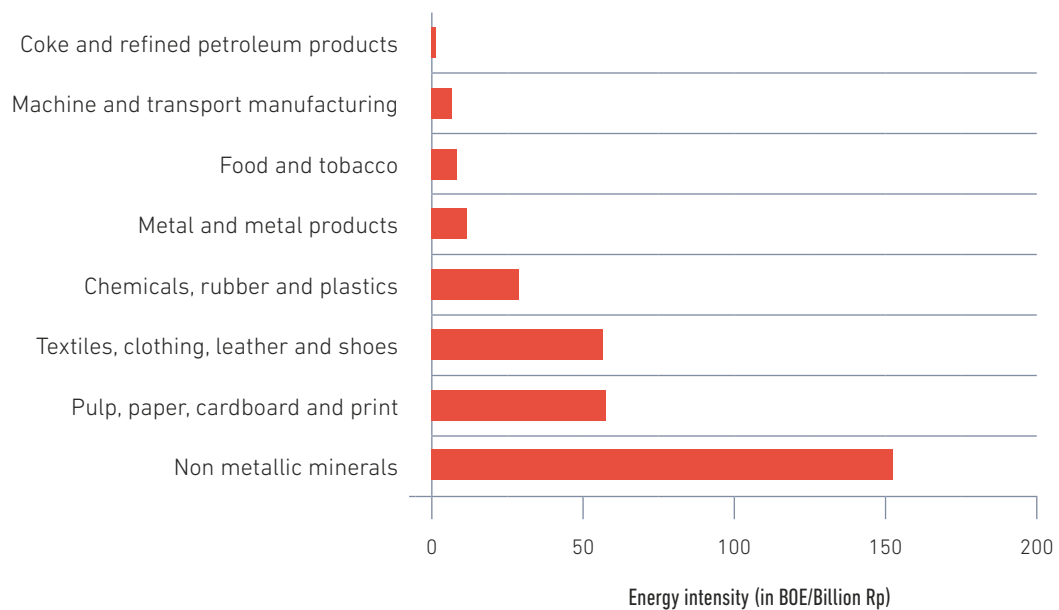
Data source: Manufacturing Industrial Statistics Indonesia 2015 in Statistics Indonesia, 2018

Figure 3. Energy consumption by fuel-type in sub-sector industry (Mtce) in 2015



The second highest electricity consuming sub-sector is chemicals, rubber and plastics sub-sector industry, also is the fourth largest contributor to the country's GDP. As such, this sub-sector represents a significant opportunity for energy savings. In its first INDC, the Government defines several actions that could be undertaken within the cement, petrochemical, steel, aluminium industries, however, no quantitative targets has as yet been defined by the Ministry of Industry.

Across industry, energy intensity in Indonesia tends to be less than 60 BOE/Billion Rp with the exception of the non-metallic minerals. Within this sub-sector, energy intensity can exceed 150 BOE/Billion Rp (Figure 4), and as such, represents another sub-sector with in which there may be significant potential for energy efficiency gains.



Data source: Manufacturing Industrial Statistics Indonesia 2015 in Statistics Indonesia, 2018

Figure 4. Energy intensity in sub-sector industry (BOE/Billion Rp) in 2015

Drivers for action

Policy drivers

Energy efficiency laws and regulations

There are a number of laws and regulations relating to energy efficiency and conservation in Indonesia. The Government enacted the Energy Law No. 30 in 2007, establishing a legal basis for national energy management. The law sets out general principles for the management of energy resources, recognizing the importance of energy security and a need to reduce dependence on imported refined oil. It also stresses the importance of energy resilience and laid the foundation for the development of Government Regulation No. 70/2009 on Energy Conservation.

Government Regulation No. 70/2009 makes provisions for efficient use of energy resources, setting out the responsibilities of governments, businesses and communities to use energy in a rational and efficient manner, including through use of energy efficient technology. It allows for the establishment of incentives to promote energy efficiency in industry and outlines requirements for audits and public reporting on energy efficiency. Specifically, the regulation requires entities consuming equal to or greater than 6,000 toe per

year to implement energy management systems, and report energy consumption annually to the Government.

Further details of the energy management requirements are set out in the Energy and Mineral Resources Ministry Regulation No. 14/2012 on Energy Management, aligning requirements with the ISO 50001 standard. Since 2012 when this regulation came in, companies have been able to report their energy management system performance online through the Energy and Mineral Resources Ministry's website: <http://aplikasi.ebtke.esdm.go.id/pome/web>.

A competency standard for energy managers and auditors was also established in 2012. The Ministry of Labor and Transmigration Decree No. 614/2012 on Competency for Energy Auditor, requires certification for energy management system implementation.

Additional policies and regulations related to energy efficiency are set out in table below (Table 2).



TABLE 2. Various polices and regulations on energy efficiency in industrial sector

Name	Main Features
Key laws, policies and regulations for energy efficiency and conservation	
Energy law no.30/2007	<p>Establishes the legal basis for energy resource management in Indonesia</p> <p>Recognizes the importance of energy conservation for energy security</p> <p>Stipulates that energy conservation is the responsibility of governments, industry, companies, and the public.</p> <p>Sets out incentives for energy suppliers and energy users</p> <p>Allows subsidies for those who are less able to afford it</p>
Government regulation no.70/2009 on energy conservation*	<p>Recognizes the need for proper utilization of energy resources, energy sources and energy</p> <p>Sets out the responsibility of government to define energy conservation policy, strategies, and programs</p> <p>Sets out the responsibility of energy suppliers and energy users to implement energy conservation principles</p> <p>Requires energy users consuming $\geq 6,000$ toe annually undertake energy management (requiring energy managers, energy conservation program, energy audit, energy improvement, energy reporting annually)</p> <p>Provides for the incentives for energy efficiency implementation</p>
Energy and mineral resources minister regulation no.14/2012 on energy management	<p>Provides further details on implementing requirements of Government Regulation No. 70/2009 including energy management systems, standardization and labelling, energy saving campaigns, and incentives</p>
Government regulation no.79/2014 on national energy policy	<p>States domestic energy resources development as a priority</p> <p>Sets out the energy conservation target for 2025: Energy elasticity is <1; energy intensity: 1% per year; final energy saving: 17%; and emission reduction potential from energy efficiency: 195 million-ton CO₂</p>
Presidential regulation no.22/2017 on national energy master plan	<p>Elaborates on plans for implementation of energy efficiency measures to reach the National Energy Policy target of Government Regulation No.79/2014</p>

Source: Author's compilation

Note: *There is on-going discussion on the revision of this law. The revision is expected to target additional energy users by lowering the threshold for annual consumption to less than 6,000 toe in a year. In addition, the revised version is expected to include a strategy for ESCO development.

Name	Main Features
Additional policies and regulations	
Corporate law no.40/2007	Regulates environmental and social responsibilities of corporations
Environmental protection and management law no.32/2009	Provides the legal basis for the protection and management of the environment in Indonesia
Presidential instruction no.61/2011 On national action plan on GHG emission reduction	Sets out national action plans to reduce GHG emissions
Energy and mineral resources minister regulation no.13/2012 on electricity consumption saving	Sets out electricity consumption savings potential for government-owned buildings, and state-owned enterprises
Energy and mineral resources regulation no.01/2013 on fuel utilization control	Sets out requirements and potential for reductions in fuel consumption.
Energy and mineral resources minister regulation no.18/2014 on energy efficiency label for CFL	Regulates energy saving labelling on compact fluorescent light bulbs (CFL)
Energy and mineral resources minister regulation no.7/2015 on implementation of minimum energy performance standard and energy saving labelling on air conditioner devices	Sets out the minimum energy performance standards and requirements for energy-saving labelling on Air-Conditioning devices.
Labor minister decree no.80/2015 on energy manager certification in industry and building	Requires a competency standard to be attained by energy managers in industrial sectors and buildings.
Presidential regulation no.38/2015 on cooperation between government and business entities in infrastructure provision	Provides for additional cooperation between government and private in infrastructure (including in relation to energy conservation infrastructure)

Energy conservation incentives

The Government Regulation No. 70/2009 incentives for energy conservation are set out in the table below (Table 3).

TABLE 3. Incentives for energy conservation

TARGET GROUPS	REQUIREMENTS
Energy users with annual consumption equal or greater than 6,000 tons of oil equivalent; and	Successful reduction in energy consumption (through Energy Management)
Producers of energy saving equipment	Compliance with specified success criteria (such as energy saving equipment having energy efficiency exceeding a specified benchmark, and has been labelled in accordance with the standard)

Incentives for energy users (group a) are in the form of

Tax exemption for energy saving products;

Breaks, reliefs, or exemption of local taxes for energy-saving products;

Import tax exemptions for energy-saving products;

Low-interest financing for investment in energy conservation; In accordance with existing laws and regulations, and/or

Energy audits paid by the government

Incentives available for manufacturers (group B)

Tax exemptions for components/spare parts and raw materials used for manufacturing energy-saving products;

Breaks, reliefs, and exemptions, of local taxes for components/ spare parts and raw materials used to manufacture energy-saving products;

Import tax exemptions for components/spare parts and raw materials used to manufacture energy saving products;

Low-interest financing for investments in the manufacture of energy saving products; in accordance with existing laws and regulations.

Penalties for non-compliance

Energy resource users and final energy users who fail to implement energy conservation measures through energy management will be subject to receiving formal warnings, public announcements of non-compliance in the media, fines or limitations on energy supply .

Source: Government Regulation No. 70/2009

The Energy and Mineral Resources Regulation No.14/2012 sets out potential incentives available to those companies conducting energy management over three consecutive years and that are successful in reducing their energy consumption by at least 2% every year (Table 4).

Table 4. Incentives for energy management

Incentives
a. Energy audit fees paid for by the government
b. Will be prioritized in their energy supply requests to the government

Disincentives
There are four kinds of disincentives which would be conducted subsequently after one another as if there is neither follow up nor improvement from the companies
a. Written warning letter
b. Announcement in mass media
c. Fine / penalty
d. Energy supply reduction

Source: Energy and Mineral Resources Minister Regulation No.14/2012

Selected insights from interviews

ENERGY REGULATIONS

There are a number of regulations on energy consumption measurement, management and reporting by energy managers and auditors, and a number of ways by which the reporting can be done. As yet, however, there exists no simple means of verification of the reports provided to the government by companies.

Because there is no means of verification, there is also no benchmark standard of what constitutes effective energy efficiency implementation. Should there be a benchmark set for each sub-sector, this would likely support companies adopting energy efficiency measures into their practice.

As yet, financial incentives for energy efficiency compliance (or penalties for non-compliance) have not been applied. An award from the Ministry of Industry publically recognizing compliance is the only incentive that has been given to date. Some companies have had a penalty applied for non-compliance with reporting requirements in the form of a public notification of non-compliance on the energy reporting website.

There are energy saving standards and labelling requirements some technologies on the market. At the moment, air conditioning and compact fluorescent lightbulbs (CFL) have standards, but these are considered too low compared to international standards.

See Appendix 1 for list of interviewees

Economic drivers

Energy subsidies

Pursuant to the Energy Law No. 30/2007, the Government provides subsidies for fuel (including LPG) and electricity. Although energy subsidies have been decreasing since 2012 (Table 5), electricity prices in Indonesia are still kept artificially low, and

are particularly low compared with other countries in the region. The Indonesian government subsidizes coal through guaranteed supplies to the state-owned electricity company and domestic industry, and also through regulating the domestic price of coal.



Table 5. Energy price subsidies (Trillion Rupiah) in 2012-2018

Energy price subsidies (in trillion Rupiah)							
	2018	2017	2016	2015	2014	2013	2012
Fuel (+LPG)	46.9	44.5	43.7	60.8	240	210	211.9
Electricity	47.7	45.4	63.10	58.3	101.8	100	94.6

Data Source: Ministry of Finance, 2018

Selected insights from interviews

FINANCE FOR ENERGY EFFICIENCY INVESTMENTS

The artificially low of electricity prices, as a result of subsidies, hinders investments in energy efficiency improvement in Indonesia, there is little incentive to reduce energy bills, for example. This is particularly the case for SMEs and companies with fewer resources to invest in energy efficiency improvements.

There are no banks currently providing low-interest loans for energy efficiency projects. Financing for energy efficiency projects is on commercial terms.

Competitiveness of Industry in Indonesia & energy efficiency

Comprehensive implementation of energy efficiency measures in industry supports further increases in industrial competitiveness. The industrial sector in Indonesia is relatively competitive internationally, ranked 39th on the 2016 Competitive Industrial Performance (CIP) index, a measure of the ability of

the countries to produce and export manufactured goods competitively produced by UNIDO (UNIDO, 2017). There is also substantial foreign direct investment (FDI) in all manufacturing sectors in the table below (based on data from Ministry of Industry).

Table 6. Industry structure

Sector	Subsector	Output 2006 (Rp trillion)	Growth since 2003 (%)	Players: International (I); National(N) *
Mining	Oil and gas	188	97	I,N
	Non oil and gas	131	145	I,N
	Quarrying	36	87	I,N
Oil and gas manufacturing	Petroleum refining	120	139	I,N
	Natural gas	54	94	I,N
	Quarrying	213	35	I,N
Non oil and gas manufacturing	Food, tobacco, beverages	213	38	I,N
	Textiles, footwear, etc.	91	34	I,N
	Wood, wood products	44	48	I,N
	Paper, printing	40	43	I,N
	Fertilisers, chemicals, rubber	96	68	I,N
	Cement, non-metallic quarry	29	50	I,N
	Iron, steel, basic metals	20	52	I,N
	Transport equipment, machinery	222	87	I,N
	Other manufacturing	7	67	I,N
Electricity, gas, water	Electricity	21	51	I,N
	Gas	5	119	I,N
	Water supply	4	4	I,N
Construction & building	Construction, building	249	98	I,N

Source: Ministry of Industry, 2017.
www.kemendag.go.id/download/17369

Energy efficiency supply chain

Value chain

The industry energy efficiency value chain in Indonesia is supported by a number of policies and regulations.



Energy managers and auditors

The Labor Minister Decree No. 80/2015 on Energy Manager Certification in Industry and Buildings, requires the attainment of certification of competency by energy managers and auditors. Following this decree, and as at 2017, there were 417 certified energy manager and 353 certified energy auditors in Indonesia. The existing standard for energy auditors in Indonesia currently only covers very technical aspects of energy conservation, and does not focus on the financial aspects, which would support the preparation of 'bankable' projects¹.

There are three institutions which certify, and provide capacity-building and training for energy managers and auditors in Indonesia: LSP BPESDM KESDM (which sits under the Ministry of Energy and Mineral Resources), LSP HAKE and LSP Energy.

ESCOs

In 2016, the Government enacted the Energy and Mineral Resources Ministerial Regulation No. 14/2016 on Efficiency Services Company (ESCO). This regulation has since been cancelled, however, it is expected to be updated and incorporated into the upcoming revision of Government Regulation No. 70/2009.

According to the data from APKENINDO (Indonesia ESCO Association), there are around 25 companies listed as ESCOs in Indonesia (APKENINDO, 2018). Of those listed, few, if any, have Investment Grade Audits (IGA) experience and capabilities. As IGAs, unlike mandatory audit requirements, incorporate financial assessments in addition to the standard, mandated technical assessments. The limited capacity in conducting IGAs should be addressed to bring them up to international standards for ESCOs.

Available financial instruments

The energy efficiency market in Indonesia lacks financing schemes easily accessible by companies (including both ESCO and other energy-users). There are limited exceptions, including financial support schemes available for PPPs pursuant to the Presidential Regulation No. 38/2015 on Cooperation between Government and Business Entities in Infrastructure Provision.

¹ Investment Grade Audits (IGA), for which, energy managers and auditors are not required to be certified, includes requirements to incorporate financial modelling and detailed energy efficiency proposals. There are limited examples where IGA has been applied (APEC, 2017).

Key stakeholders in the energy efficiency value chain

Set out below is an organisational chart of the Ministry of Energy and Mineral Resources in Indonesia (Figure 5). The Directorate of General of New Renewable Energy and Energy Conservation, and within this, of Energy Conservation, hold primary responsibilities

for planning, budgeting, and policy development related to energy efficiency in Indonesia. Other key actors both within government, and supporting donor organisations and their responsibilities with respect to energy efficiency are set out in Table 7 below.

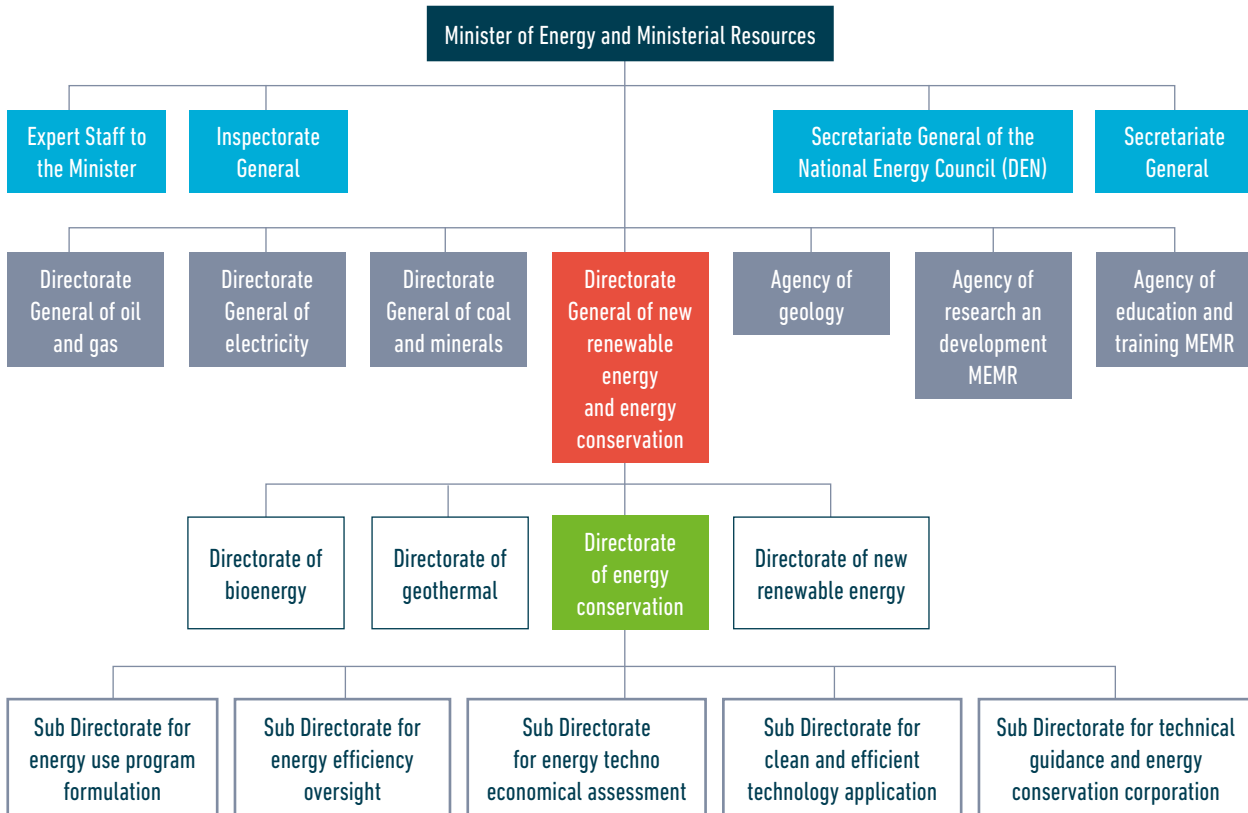


Figure 5. MEMR organisational chart

TABLE 7. Key actors and responsibilities

ACTOR		RESPONSIBILITIES
Government Bodies	Donor Organizations	
Bappenas, FSA, MOF, MEMR, Parliament	n/a	Planning and budgeting
MEMR, MOF, MOL, MOEF	ADB, AFD, DANIDA, IFC	Policy development
MOF, FSA, MEMR	ADB, AFD, IFC, DANIDA, GIZ, UNIDO	Capacity building
MEMR, FSA, MOF	ADB, IFC, GIZ, AFD	Finance mechanism
MEMR	JCM, DANIDA, AFD	Project development

Notes: Bappenas = National Development Planning Ministry; FSA = Financial Services Authority; MOF = Ministry of Finance; MEMR = Ministry of Energy and Mineral Resources; MOL = Ministry of Labor; MOEF = Ministry of Environment and Forestry

Existing initiatives

The below table (Table 8) summarises some of the key initiatives that have tried to address barriers to energy efficiency uptake, in industry in particular.

TABLE 8. Key existing initiatives relating to energy efficiency in Indonesia

Initiatives	Type of Support	Period	Implementer	Result/Status	Barrier
Private/public energy efficiency financing mechanisms					
1 Joint Crediting Mechanism (JCM)	Technology subsidy: 50% subsidy for GHG mitigation projects	2013 – 2020 (ongoing with possible extension)	Japanese building owner, project developer	Two energy savings projects in commercial buildings	Availability of funds
2 Policy loan programme/ energy efficiency accelerator programme	Concessional credit lines Technical assistance	Ongoing	ADB; MEMR	Supported development of ESCO regulation; supports to IGA trainings	Project development and transaction costs
3 ESCO programme	ESCO support/ Super ESCO: Technical assistance	Ongoing	AfD; ESCO firms; PT. SMI	Support ESCO companies to develop projects; supports PT.SMI for project development	Project development and transaction costs
3 Clean energy information and communication centre (LINTAS)	General energy efficiency finance, information gathering and data collection	Ongoing	Danish embassy; MEMR	The Danish Embassy is providing one more year of finance.	Information, awareness and
4 Green building programme	General energy efficiency finance, Technical assistance	Ongoing	IFC; DKI Jakarta; MEMR	EDGE software implementation (cost estimation for retrofits in buildings in DKI Jakarta, Bandung and Surabaya)	Limited capacity
5 Concessional loan to EXIM bank	Concessional credit lines: Financial incentive	Stopped in 2016	ADB; banks; EXIM bank	Two projects were financed before the scheme was stopped.	Availability of funds
6 Energy Efficiency Concessional loan	Concessional Credit line:	Stopped in 2016	AFD; MEMR; project dev.	Bank Mandiri provided concessional lending. The credit line was closed in 2016 without any projects being financed.	Availability of funds

	Initiatives	Type of Support	Period	Implementer	Result/Status	Barrier
8	Energy Efficiency revolving fund	Energy efficiency revolving fund: Technical assistance	2011-2013	Carbon trust, UNDP, MEMR, MoF	Developed a concept and programme for a revolving fund. Due to government changes it was not approved.	Availability of funds
9	IEPC I and IEPCII	Concessional credit line: Financial incentive	Finished in 2012	KfW, MEMR	Loans were provided for EE technology.	Availability of funds
10	Energy efficiency financing capacity building programme	Super ESCOs: Free IGAS	ongoing	MEMR, AFD	IGA training	Limited capacity

Framework conditions

11	Indonesian financial support (INFIS)	Technical assistance	Ongoing	GIZ, OJK	Provide technical assistance to OJK for example to conduct a project finance analysis.	Risk perception
12	First movers programme	Technical assistance	2016 – July 2017	OJK; Environmental NGO	Drafted the sustainable investment guidelines. Follow up programme has started.	Limited capacity

Financial incentives

13	Green Chiller	Financial incentive	2014 - present	MEMR GIZ	Conducted a study on financial incentives for EE cooling	Finance, risk perception
14	Green Building Code implementation	Tax incentive	2012 - present	Ministry of Public Works, city of Bandung; city of Surabaya	Green commercial buildings can get some tax benefits. However, the operationalization is still being developed.	Finance, risk perception

Barriers to industrial energy efficiency in Indonesia

The below table summarises some of the key barriers identified as part of desktop research and interviews with key stakeholders.

Table 9. Key identified barriers to industrial energy efficiency in Indonesia

CATEGORIES	MAIN BARRIERS
Awareness and commitment of industry	Limited knowledge and understanding of the benefits of and opportunities for energy efficiency gains across industry. High upfront costs relative to the perceived lack of long-term benefits deter investments in energy efficiency projects. Further, energy efficiency is not seen as a core part of business and energy efficiency projects have to compete with investments in the core business. Standard company investment guidelines require internal rates of return (IRR) which are too high to make energy efficiency projects viable (>20%), so energy efficiency investments are de-prioritized within companies.
	There are no penalties for not reporting, and no enforcement of requirements for reporting
	There is a lack of cross-ministerial vision and communication with government ministries connected with energy efficiency.
	Artificially low electricity price due to electricity subsidy.
	Challenges in energy consumption data collection
Technical solutions and expertise	Lack of basic knowledge about energy efficiency among regulatory bodies, and limited specific technical skills for professionals (e.g. IGA knowledge).
	Lack of energy modelling expertise
	“Business as usual” mind-set. Many engineers generally follow a business-as-usual approach and are not ready to take risks.
	Lack of linkage between research centres and construction industries.
	Lack of both technical and financial capacities of ESCO.
	Lack of access to reliable information to enable appropriate risk assessments by financial institutions
Financial resources	Limited financial capital to support energy efficiency projects
	Lack of banks with experience in small-scale energy efficiency financing
	Lack of incentives for those financial institutions finance to energy efficiency projects.
	Lending regulations do not accommodate energy efficiency project finance differences to other forms (energy savings considered as cash flow)
	Financial institutions are not aware of project-based financing schemes
	Transaction costs are too high due to limited project pipelines and energy efficiency projects that are too small.
	Limited capacity amongst some consultants/project developers to prepare ‘bankable’ business cases.

What solutions can address the barriers?

There are several solutions can help address some of the key barriers to energy efficiency implementation in Indonesia. These have been categorized into the four pillars of the Global Industrial Energy Efficiency Accelerator (see matrix below). Of these solutions, a number of high-priority solutions emerged across three of the pillars, which are detailed below. These solutions were prioritised on the basis of political feasibility and government support, their additionality and complementarity to existing initiatives, and their potential for impact.



Pillar # 1 **Develop country-specific industrial energy efficiency policy measures**

To develop policy support and create enabling environment for ESCO development and implementation in industrial sector. This may require a set of appropriate policies and regulatory framework that will support the recognition and implementation of ESCO business models in Indonesia.

Develop a portfolio of best-practice example case studies to build banks' capacity around EE loan assessment and the assessment of risks

Provide recommendations on reducing transaction costs to simplify loan assessment procedures, including the development of standardised contracting solutions between ESCOs and industries and ESCOs and banks



Pillar # 3 **Develop a pipeline of investable industrial energy efficiency projects**

To facilitate and support the establishment of ESCOs and improve ESCOs capacity.

Provide recommendations on reducing transaction costs to simplify loan assessment procedures, including the development of standardised contracting solutions between ESCOs and industries and ESCOs and banks







Pillar # 4 **Generate financing solutions to unlock energy efficiency development**

To design/support establishment of an effective de-risking financing mechanism for ESCOs

To develop capacity of banking and financial institutions to assess energy efficiency project investment risks, including for ESCOs

Table 10. Potential solutions to barriers to industrial energy efficiency uptake in Indonesia, linked to GIEEA Pillars.

Barriers/ Solutions	Awareness & commitment	Technical	Financial
 Policy development	Strengthening cross-ministries communication	Providing policy advice to support ESCO market	Remove electricity subsidy and use the fund to lower energy efficiency investment
	Prepare case studies to understand different business models of ESCOs based on experiences in similar contexts	Revise the Government Regulation No.70/2009 on Energy Conservation	Create incentives for financial institutions financing energy efficiency projects De-risking through standardised underwriting and investment framework
 Capacity building	Trainings for government officials	Build capacity of industry to adopt EMS	Build banks' capacity around EE loan assessments and risk, including case studies
	Raise awareness of industry to adopt EMS	Build capacity of Investment Grade Auditors (IGA) and IGA verifiers Create an accreditation mechanism for ESCOs, technologies and suppliers	Reduce transaction cost and simplify the financial procedures for EE loan approval
 Pipeline		Build IGA auditor and verifier	Develop standard contracting solutions between ESCOs and industries and ESCOs and banks
		Develop a list of successful energy efficiency projects with available technologies and suppliers	Investigate aggregator models to bundle EE projects
 Finance	Disseminating a list of successful energy efficiency project case studies		Financing ESCO demonstration projects
			Consider the creation of a risk sharing facility and guarantee fund for energy efficiency projects

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APPENDIX 1

Interviewees

No	Name	Institution Name	Institution Type
1	Hariyanto	Director of Energy Conservation, MEMR	Government
2	Edi Sartono	Directorate of Energy Conservation, MEMR	Government
3	Devi Laksmi Zafilus	Directorate of Energy Conservation, MEMR	Government
4	Rahmat Mardiana	Director of Energy Infrastructure, Bappenas	Government
5	Adi Pranasatrya	PT Sarana Multi Infrastruktur	Financial Institution
6	Rory Ratnawati	Bank Negara Indonesia	Financial Institution
7	Randy Rakhmadi	Climate Policy Initiative	Consultant
8	Verena Streitferdt	Pertiwi Consulting	Consultant
9	Jon Respati	Indonesia Energy Conservation Society / MASKEEI	Association
10	Mada Habsari	PT Enertec Enviromate Solusi	ESCO
11	Kristi Astuti	EPS Capital Corp	ESCO
12	Agus Barliandi	PT Ispat Indo	Steel Company
13	Aris Ika Nugrahanto	UNIDO	Multilateral Organization
14	Kai Berndt	GIZ	Multilateral Organization
15	Yudha Siregar	DANIDA	Multilateral Organization



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