

## Country Assessment Report

### Country/Region Name- Indonesia:

Indonesia is an archipelago situated in South East Asia, between the Pacific and Indian Oceans; bordered by Malaysia and Papua New Guinea. It has a population over 267 million and GDP worth over \$1 trillion. It has a high growth rate of 5.1% and hasn't experienced negative growth since 1998.

### Economic Structure and Activity:

Indonesia has a mixed economic system. Indonesia is a member of APEC (Asia-Pacific Economic Cooperation). The economy has made significant steps to diversify from its dependency on the agricultural sector over the last couple of decades. The service sector accounts for the majority share of Indonesia's GDP. The banking sector is maturing with Islamic Bank Syria expanding significantly in recent years. Tourism is another area of high growth and major source of income, although terrorism, natural disasters and the coronavirus pandemic have slowed progress in recent years. The industrial sector contributes 39.73% of overall GDP and specialises in the manufacturing of textiles, cement, chemical fertilisers, electronics, rubber tyres, clothing and timber production. The nation also plays host to many subsidiaries of multinational companies, including Unilever, Toyota, L'Oreal and Exxon Mobil.

Indonesia has abundant natural resource reserves, is the world's largest nickel ore producer and is a major exporter of stainless steel. Agriculture accounts for 12.81% and main exports include rice, sugarcane, tea, coffee, tobacco and palm oil.

(Santander 2018; Cekindo 2020)

### Top Private Companies with RE commitments:

*Adaro Energy (Mining)* - established Adaro Power in 2010 to diversify its business plan from pit to power. Although primarily focused on delivering coal-powered electricity supports in conjunction with its mining industry, it is beginning to diversify its energy portfolio through RE deployment. It recently installed a 100-kWp rooftop-mounted solar PV panels at AI's coal processing and barge loading facility in Kelanis, Central Kalimantan and is expected to generate 125,000 kWh per year. In 2018, Adaro signed an MOU with EDF energy to conduct a joint feasibility study of solar and biomass power plants in Sulawesi, Indonesia.

### Generation and demand: (type, MW, TWh)

#### Indonesian electricity generation scenario:

Installed capacity of the Indonesian national grid (as of November 2017) including the capacity installation of the Indonesian state-owned electricity company, Perusahaan Listrik Negara (PLN), as well as rented, excess power, IPP, and cooperation with other electricity generators:

- Hydro & Mini Hydro: 4,400.96 MW
- Geothermal: 1,718.00 MW
- Biomass: 49.00 MW

- Solar: 11.00 MW
- Biofuel: 79.20 MW
- Other new & renewable: 1.00 MW
- Gas: 4,647.00 MW
- Gas Steam: 11,347.00 MW
- Gas engine: 491.22 MW
- Diesel: 5,462.00 MW
- Coal Steam: 24,611.50 MW
- Fuel/Gas Steam: 1.760.00 MW

(Source: [http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya\\_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20\(Persero\)%202018-2027.pdf](http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20(Persero)%202018-2027.pdf))

Generation Technology per Province 2018	Biogas	Biomass	Coal	Diesel & Fuel Oil	Gas	Geothermal	Hydro	PV	Waste	Wind	Total
Bali	-	-	426	263	357	-	-	-	-	1	1047
Banten	-	-	6201	-	740	-	6	-	-	-	6947
Central Java	-	-	5690	62	1034	60	306	-	-	-	7152
East Java	-	-	6770	25	2855	-	276	-	-	-	9926
Jakarta	-	-	-	2799	134	-	-	-	-	-	4139
West Java	-	-	2700	1158	1294	1199	2013	-	10	-	8374
Total Java	-	-	21787	4307	762	1259	2601	-	10	1	37585
Aceh	-	-	220	98	435	-	20	-	-	-	773
Bengkulu	-	-	-	39	-	-	253	-	-	-	292
Jambi	-	-	12	10	392	-	-	-	-	-	414
Lampung	-	-	-	-	160	210	230	-	-	-	1054
North Sumatra	2	-	1000	271	1320	460	534	-	-	-	3587
Riau	-	-	234	279	465	-	114	-	-	-	1092
South Sumatra	-	-	1277	25	864	-	134	1	-	-	2301
West Sumatra	-	-	407	9	54	-	302	-	-	-	772
Total Sumatra	2	-	3604	731	3690	670	1587	1	-	-	10285
TOTAL	4	33	25513	5307	11385	1929	4188	1	10	1	48371

**Table 1.** Provincial capacities by generation technology (Reference Year).

(Source: [http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya\\_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20\(Persero\)%202018-2027.pdf](http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20(Persero)%202018-2027.pdf))

Electricity generation from RE has relatively plateaued at 12% supply between 2007 and 2016 whilst total electricity production has risen by 70% and coal capacity has more than doubled (Ministry of Energy and Natural Resources, 2016).

#### Indonesian electricity demand scenario:

Electricity sales by consumer type (in 2016):

- Residential: 92.886 TWh
- Industrial: 67.586 TWh
- Commercial/business enterprises: 38.963 TWh
- Social: 6.573 TWh
- Government offices: 3.969 TWh
- Public street lighting: 3.478 TWh
- **TOTAL: 213.455 TWh**

(Source: [http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya\\_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20\(Persero\)%202018-2027.pdf](http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20(Persero)%202018-2027.pdf))

[DM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20\(Persero\)%202018-2027.pdf](#)

Installed capacity is currently only able to meet 86.39% of electricity demand, which is much lower than neighboring SEA nations including Singapore, Thailand, Malaysia and Vietnam (Deloitte 2016). Indonesia must shift to a greater generation capacity in conjunction with its rapid economic growth.

#### **Electrical Interconnection and import/export:**

The national power grid of Indonesia is constituted by 50 sub-national (regional) grids<sup>1</sup>, which is also connected with the Malaysian grid at one point<sup>2</sup>.

Electricity imports and exports by country (up to Semester I 2017):

- Export to Malaysia: 0 GWh
- Import from Malaysia: 274 thousand Barrel of Oil Equivalent (446.19 GWh)
- **NET EXPORT: -446.19 GWh**

(Source: <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-economic-statistics-of-indonesia-2017--1.pdf>)

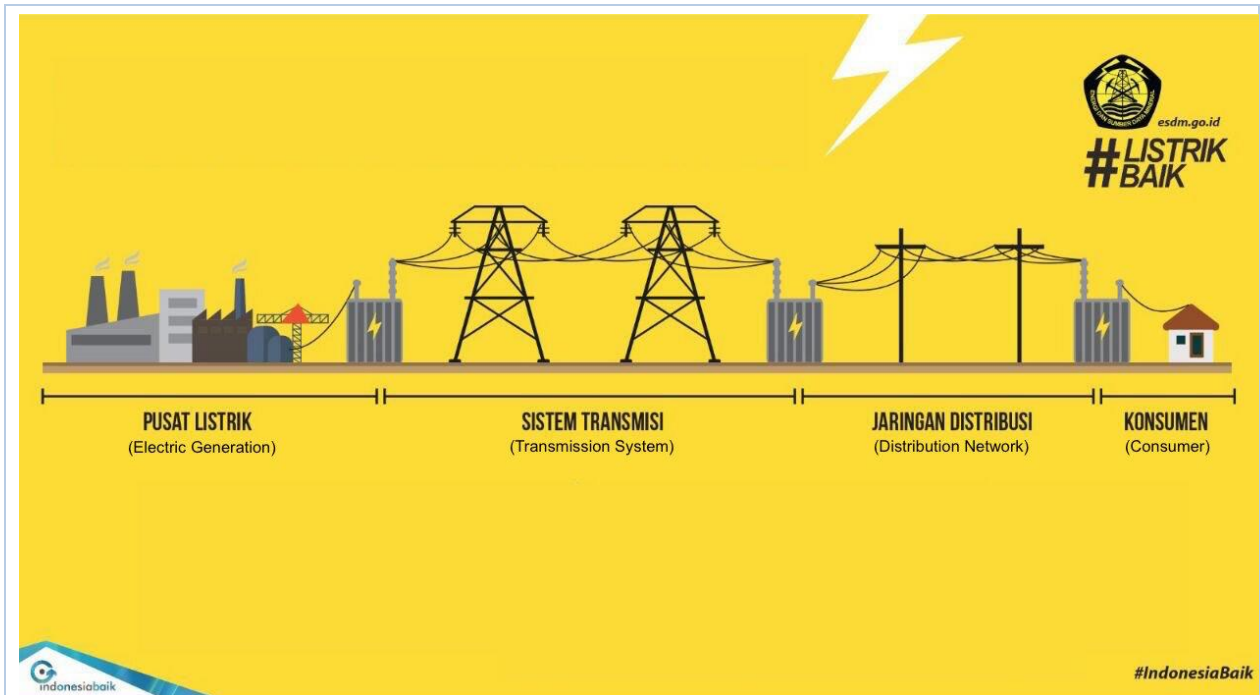
#### **Market Structure:**

The electric power industry in Indonesia is managed solely by Perusahaan Listrik Negara (PLN), a state-owned electricity company, which has various business units to carry out functions that include generation, transmission, and distribution. PT. PLN (Persero) is obliged to purchase electricity from power plants utilizing Renewable Energy Resources.

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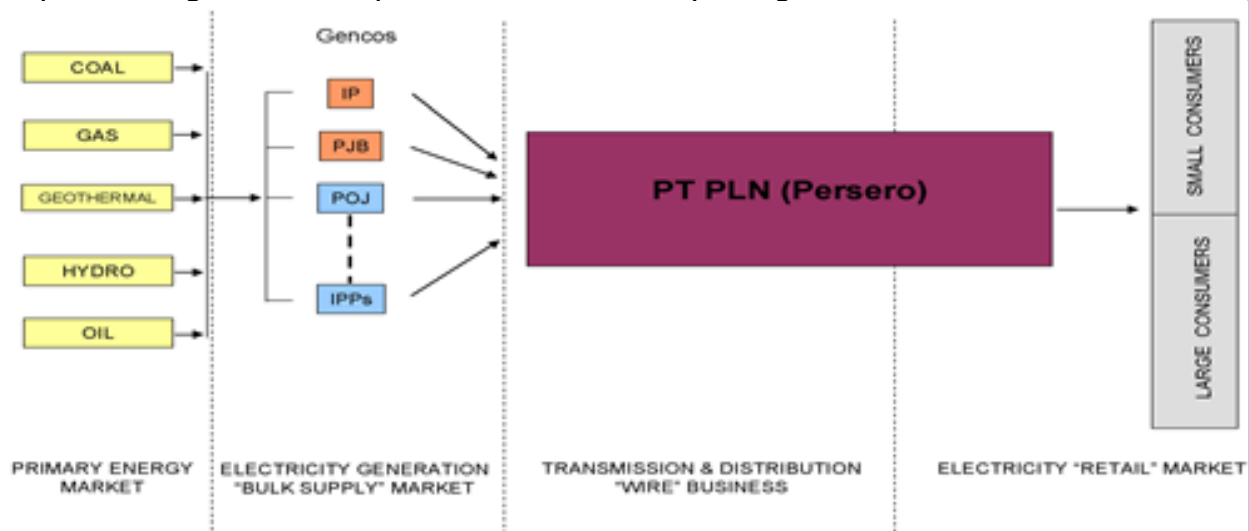
<sup>1</sup> <http://www.djk.esdm.go.id/pdf/Faktor%20Emisi%20Gas%20Rumah%20Kaca/Faktor%20Emisi%20GRK%20Tahun%202016.pdf>

<sup>2</sup> <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-economic-statistics-of-indonesia-2017--1.pdf>



**Figure 1.** Electricity market structure and organisation<sup>3</sup>

The structure of the current Indonesian electricity supply industry is shown in Figure 1. The overall electric supply system includes generation, transmission, distribution, and sales of electricity to the consumer. The state-owned enterprise PLN is given the first priority to do the business of providing electricity for the public interest. Various aspects of Figure 1 are expanded for more clarity in Figure 2 below:



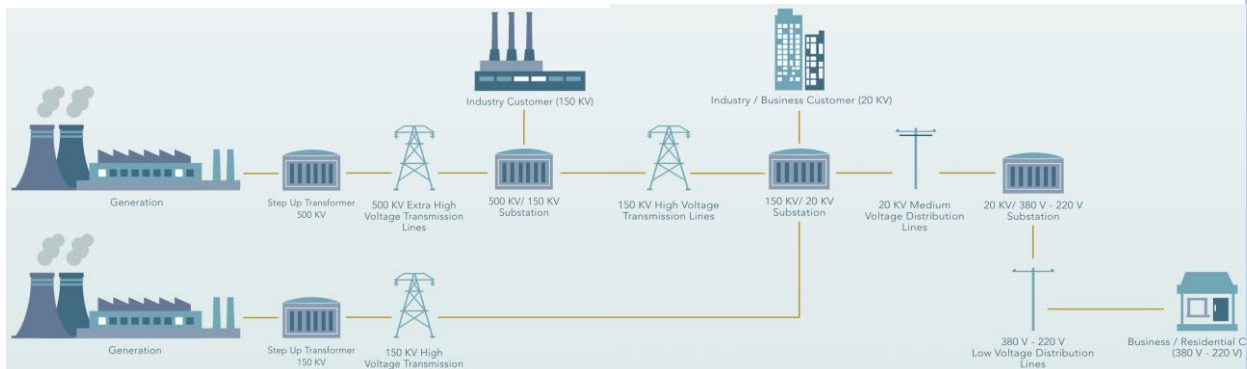
**Figure 2.** Current electricity market in Indonesia<sup>4</sup>

The electricity state-owned enterprise is PT. Perusahaan Listrik Negara (Persero) or PT. PLN (Persero). PT. PLN (Persero) has core business in electricity supply, especially

<sup>3</sup> <https://twitter.com/kementerianesdm/status/791553235366449153>

<sup>4</sup> [https://www-pub.iaea.org/mtcd/publications/pdf/cnpp2013\\_cd/countryprofiles/Indonesia/Indonesia.htm](https://www-pub.iaea.org/mtcd/publications/pdf/cnpp2013_cd/countryprofiles/Indonesia/Indonesia.htm)

in power generation, transmission, distribution, and retail, which is graphically represented below in Figure 3<sup>5</sup>.



**Figure 3. PT. PLN (Persero) core business<sup>6</sup>**

**References:**

- Law of Republic of Indonesia No. 15 Year 1985 regarding Electricity<sup>7</sup>
- Law of Republic of Indonesia No. 30 Year 2007 regarding Energy<sup>8</sup>
- Law of Republic of Indonesia No. 30 Year 2009 regarding Electricity<sup>9</sup>
- Government Regulation of Republic of Indonesia No. 14 Year 2012 regarding Electric Power Supply Activities<sup>10</sup>
- Regulation of Ministry of Energy and Mineral Resources Republic of Indonesia No. 50 Year 2017 regarding Utilization of Renewable Energy Sources for Electricity Supply<sup>11</sup>

**Responsible Government Department:** (include key contacts)

*The Ministry of Energy and Mineral Resources (MEMR)* is the leading government institution in Indonesian’s energy sector<sup>12</sup>. It is responsible for creating and implementing Indonesia’s energy policy including the National Electricity General Plan and regulating the power sector through the DGE and the DGNREEC. It is also charged responsible for preparing implementing regulations related to electricity, the NRE and energy conservation, and endorsing PLN’s RUPTL.

*Directorate General of Electricity of the Ministry of Energy and Mineral Resources* is the executing body of some duties and functions of the Ministry, including the formulation and implementation of technical policies and standardization in the field of electricity.<sup>13</sup>

<sup>5</sup> <http://www.pln.co.id/statics/uploads/2017/07/COMPRO-PLN-2016.pdf>

<sup>6</sup> <http://www.pln.co.id/statics/uploads/2017/07/COMPRO-PLN-2016.pdf>

<sup>7</sup> <http://www.dpr.go.id/dokjdi/document/uu/682.pdf>

<sup>8</sup> <http://popea.ebtke.esdm.go.id/regulasi/1396494138.pdf>

<sup>9</sup> <http://pelayanan.jakarta.go.id/download/regulasi/undang-undang-nomor-30-tahun-2009-tentang-ketenagalistrikan.pdf>

<sup>10</sup> <http://pelayanan.jakarta.go.id/download/regulasi/peraturan-pemerintah-nomor-14-tahun-2012-tentang-kegiatan-usaha-penyediaan-tenaga-listrik.pdf>

<sup>11</sup> <http://jdih.esdm.go.id/peraturan/PerMen%20ESDM%20NO.%2050%20TAHUN%202017.pdf>

<sup>12</sup> Law of Republic of Indonesia No. 30 Year 2007 regarding Energy

<sup>13</sup> <http://www.djk.esdm.go.id/index.php/tentang-kami/sejarah-singkat>

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*Directorate General of New Energy, Renewable Energy and Conservation of the Ministry of Energy and Mineral Resources* is the executing body of some duties and functions of the Ministry, including organizing policy formulation and implementation in the field of fostering, controlling and supervising geothermal, bioenergy, new and renewable energy, and energy conservation.<sup>15</sup>

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*PT. Perusahaan Listrik Negara (Persero) or PT. PLN (Persero)* is the electricity state-owned enterprise. PT. PLN (Persero) has core business in electricity supply, especially in power generation, transmission, distribution, and retail.

**Existing/Planned Energy Legislation:** (is there a CPO)

MEMR has an "Electricity Supply Business Plan (*Rencana Usaha Penyediaan Tenaga Listrik* or *RUPTL*) for 2018 – 2027<sup>17</sup> that provides guidance for the future development of the energy and electricity sector to implement energy policies. By RUPTL it is expected that PLN's electric power facilities can be more efficient, more planned and environmentally friendly in fulfilling the need of electric power, so it can avoid the inefficiency of the company since the planning stage. RUPTL targets to be achieved in the next ten years are the fulfilment of national demand for electricity capacity and energy, utilization of new and renewable energy, increasing efficiency and performance of power system since the planning stage which includes achieving the desired level of reliability, achieving energy mix, and utilization of new and renewable energy.

Law of Republic of Indonesia No. 30 Year 2007 regarding Energy: New energy resources and renewable energy resources are regulated by the state and utilized for the greatest prosperity of the people (*Sumber daya energi baru dan sumber daya energi terbarukan diatur oleh negara dan dimanfaatkan untuk sebesar-besar kemakmuran rakyat*). Thus the regulation in terms of electricity supply is regulated by the government. Electricity business is carried out by (as the owners and developers) state-owned enterprises (as a first priority), regional-owned enterprises, private parties, cooperatives, and community's participations.

In 2007, the Law No. 30 regarding Energy was enacted, establishes the legal framework for the energy management. This law was considering limitation of reserves of the non-renewable energy, hence requires an action for diversity of energy resources to ensure the availability of energy in Indonesia. This law promotes different forms of renewable energy, such as geothermal, wind, bioenergy, solar photovoltaic, hydro, tidal, and ocean thermal energy conversion. This is done by:

- Central and Local Governments are obliged to increase the utilization and supply of new energy and renewable energy in accordance within their authority.

<sup>15</sup> <http://ebtke.esdm.go.id/profile/2/tugas.dan.fungsi>

<sup>17</sup>

[http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya\\_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20\(Persero\)%202018-2027.pdf](http://www.djk.esdm.go.id/pdf/RUPTL/Salinan%20Sesuai%20Aslinya_Kepmen%20ESDM%20ttg%20Pengesahan%20RUPTL%20PT%20PLN%20(Persero)%202018-2027.pdf)

- The supply of energy from new energy sources and renewable energy sources by any business entities and individuals may obtain the ease and/or incentives from the Government and/or Local Governments in accordance within their authority for a certain period of time until their economic value is reached.
- Central and Local Governments are obliged to facilitate the research and development of science and technology on the supply and utilization of energy, especially directed to the development of new energy and renewable energy.

However, there are no any Renewable Energy Certificate (REC) schemes either presently operating in Indonesia or explicitly planned for the foreseeable future.

### **Environmental Legislation for RE:**

Based on law and regulation regarding energy and electricity the environmental issue had been accommodated as following:

- Law of Republic of Indonesia No. 15 Year 1985 regarding Electricity: Development of electricity based on the principle of benefits, fair and equitable principles, principles of self-belief, and environmental sustainability (*Pembangunan ketenagalistrikan berlandaskan asas manfaat, asas adil dan merata, asas kepercayaan pada diri sendiri, dan kelestarian lingkungan hidup*).
- Law of Republic of Indonesia No. 30 Year 2007 regarding Energy: Every energy management activity shall prioritize the use of environmentally friendly technologies and meet the requirements required in environmental legislation (*Setiap kegiatan pengelolaan energi wajib mengutamakan penggunaan teknologi yang ramah lingkungan dan memenuhi ketentuan yang disyaratkan dalam peraturan perundang-undangan di bidang lingkungan hidup*).
- Law of Republic of Indonesia No. 30 Year 2009 regarding Electricity: Every electricity business activity is required to comply with the provisions required in the legislation in the environmental field (*Setiap kegiatan usaha ketenagalistrikan wajib memenuhi ketentuan yang disyaratkan dalam peraturan perundang-undangan di bidang lingkungan hidup*).
- Government Regulation of Republic of Indonesia No. 14 Year 2012 regarding Electric Power Supply Activities: Application for operation permit as referred to in Article 28 must meet administrative, technical and environmental requirements. Environmental requirements as referred to in paragraph (1) of Article 29 shall apply the provisions of legislation in the field of environmental protection and management. (*Permohonan izin operasi sebagaimana dimaksud dalam Pasal 28 harus memenuhi persyaratan administratif, teknis, dan lingkungan. Persyaratan lingkungan sebagaimana dimaksud pada ayat (1) berlaku ketentuan peraturan perundang-undangan di bidang perlindungan dan pengelolaan lingkungan hidup*).

Based on law and regulation specifically for environmental permit<sup>18</sup> related with electricity generation:

- Law of Republic of Indonesia No. 32 Year 2009 regarding Protection and Management of Environmental<sup>19</sup>: Any business and/or activity required to have an Environmental Impact Assessment (EIA) or Environment Management Plan-Environment Monitoring Plan shall have an Environmental Permit (*Setiap usaha dan/atau kegiatan yang wajib memiliki Amdal atau UKL-UPL wajib memiliki izin lingkungan*).
- Government Regulation of Republic of Indonesia No. 27 Year 2012 regarding Environmental Permit<sup>20</sup>: Environmental Permit is a permit granted to any person undertaking a Business and / or Activity that must has Environmental Impact Assessment (EIA) or Environment Management Plan-Environment Monitoring Plan in the framework of environmental protection and management as a prerequisite to obtain a Business and/or Activity license (*Izin Lingkungan adalah izin yang diberikan kepada setiap orang yang melakukan Usaha dan/atau Kegiatan yang wajib Amdal atau UKL-UPL dalam rangka perlindungan dan pengelolaan lingkungan hidup sebagai prasyarat memperoleh izin Usaha dan/atau Kegiatan*).
- Regulation of Ministry of Environmental Republic of Indonesia No. 5 Year 2012 regarding Type of Business Plan Activities required to have an EIA<sup>21</sup>: in the field of electricity also new and renewable energy business plan activities as following:
  - Geothermal power plant: capacity <sup>3</sup> 55 MW
  - Hydro (run-of-river): capacity <sup>3</sup> 55 MW
  - Municipal solid waste: capacity <sup>3</sup> 30 MW
  - Solar, wind, biomass/peat: capacity <sup>3</sup> 10 MW (in one location)
  - Construction of biofuel refinery: capacity <sup>3</sup> 30,000 ton/year
- Regulation of Ministry of Environmental Republic of Indonesia No. 8 Year 2013 regarding Procedure of Assessment and Examination of Environmental Documents and Environmental Permit Issuance<sup>22</sup>: Issuance of Environmental Permit shall be conducted simultaneously with the issuance of environmental feasibility decision (*Penerbitan Izin Lingkungan sebagaimana dimaksud pada ayat (1) huruf a dilakukan secara bersamaan dengan penerbitan keputusan kelayakan lingkungan hidup*).

<sup>18</sup> <http://pelayananterpadu.menlhk.go.id/index.php/izin-lingkungan>

<sup>19</sup> [http://jdih.menlh.go.id/pdf/ind/IND-PUU-1-2009-UU%20No.%2032%20Th%202009\\_Combine.pdf](http://jdih.menlh.go.id/pdf/ind/IND-PUU-1-2009-UU%20No.%2032%20Th%202009_Combine.pdf)

<sup>20</sup> <http://jdih.menlh.go.id/pdf/ind/IND-PUU-3-2012-PP%2027%20-%202012.pdf>

<sup>21</sup> <http://jdih.esdm.go.id/peraturan/PerMen%20ESDM%20NO.%2050%20TAHUN%202017.pdf>

<sup>22</sup> <http://jdih.menlh.go.id/pdf/ind/IND-PUU-7-2013-Permen%20LH%2008%20th%202013%20Tata%20Laksana.pdf>



**Existing/Planned Certificate Systems:** (purpose, extent)

None – there are no REC schemes either presently operating in Indonesia or explicitly planned for the foreseeable future.

**RE Market potential:**

Indonesia has vast amounts of RE potential given its land mass, geographical positioning and diverse topography. Indonesia is situated on the Ring of Fire and has the second largest geothermal resources globally. It currently has the second largest installed capacity after the US. The RUPTL (Electricity Supply Business Plan) has

Source	Potential Power Generation
Hydropower	75 GW
Geothermal	29 GW
Biomass	33 GW
Solar Photovoltaic (“PV”)	208 GW <sub>p</sub> (4.80 kWh/m <sup>2</sup> /day)
Wind Power	61 GW (3 – 6 m/s)
Ocean	18 GW

detailed plans for an additional 4000 MW by 2027 and as table 2 suggests, the overall potential for geothermal electricity generation is 29 GW.

In recent years, most RE investment has been targeted towards hydro and geothermal, with investment in both wind and solar significantly lagging. Many undeveloped, viable sites remain amongst Indonesia’s coastal regions, where average wind speeds of 5-6 m/s have been recorded (IRENA 2017). Elsewhere, low wind speeds throughout much of the archipelago, particularly inland, reduces the scope for potential sites. The potential for solar is available throughout the nation but remains underdeveloped.

**Table 2.** Potential power generation by RE source (PWC 2017).

Multiple factors support renewable deployment in Indonesia, including falling costs, national carbon emissions targets, the high cost of oil-based generation (especially in remote regions) and the regulatory and physical barriers to gas distribution.

**Market risks and challenges:**

Indonesia’s unique geography poses technical constraints to RE deployment, with electricity supply and demand varying across its 13,000 islands. Areas hosting low-cost land are either far from heavily populated places with weak grid connections or possess poor RE potential. A significant investment in grid management, grid hardware, additional storage and further integration of regional grids through more transmission networks could help overcome distributional challenges.

The lack of a bankable PPA has become a major concern. Of the 70 RE projects signed before the end of 2017, 55 projects have since experienced financing

difficulties. As of June 2018, 45 projects were reported to have made no progress towards financial close with only four projects having reached COD. METI (Indonesian Renewable Energy Society) also claimed most members were unable to secure funding for new renewables projects under the new PPAs.

<https://www.iisd.org/sites/default/files/publications/roadblocks-indonesia-renewable-energy.pdf>

**Extent of Engagement with Government:** (brief summary of any contact already made with the national government regarding certification in general and I-REC)

None yet.

**Expected response from Government:**

At least neutral if not positive

**Current Environmental Reporting in Energy:**

Environmental reporting is required by Laws and Government Regulations in terms of electricity, energy management, electricity business activity, electric power supply activities. In addition to that, there are Laws, Government Regulations, and Ministry of Environment Regulations that specifically regulate environmental permit. Further information is provided under the header "Environmental Legislation for RE" in the section above.

**Any other Relevant Information:**

Although it is an important goal of the Indonesian government to further promote and foster renewable energies, there are no REC schemes either presently operational in Indonesia or explicitly planned for the foreseeable future. Hence a renewable energy project in Indonesia should be able to claim and issue I-RECs without any double counting or contradiction. On the other hand, even if a domestic REC scheme comes up in the future (although not yet perceived on the horizon), a renewable energy project in Indonesia should still be able to claim either I-RECs or any future domestic Indonesian RECs at any given point in time for any given MWh generated by the project. This is also in line with the relevant I-REC Code clause: "***An I-REC can exist sequentially from another energy attribute tracking methodology (e.g. the Guarantee of Origin in Europe) such that only one is active at a point in time***". Hence, under the present scenario, any renewable energy project from Indonesia applying for I-REC Production Device Registration should be readily acceptable by the I-REC Standard for issuing I-RECs.

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