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Emerging Independent Power Producers in Southeast Asia – Is there a Business Case for European Energy Firms in Indonesia?

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Every morning in Africa, a Gazelle wakes up. It knows it must run faster than the fastest lion or it will be killed. Every morning a Lion wakes up. It knows it must outrun the slowest Gazelle or it will starve to death. It doesn't matter whether you are a Lion or a Gazelle... when the sun comes up, you'd better be running.

African proverb, source unknown

Executive Summary

Independent Power Producers (IPPs) fulfill an important role in supporting emerging economies along their path towards growth. The business model of IPPs, to develop, construct, and operate power plants in order to sell the produced electricity to state-owned incumbents, offers an attractive opportunity for European energy firms' global strategies. In this context, Indonesia occupies a unique position among the Southeast Asian countries in terms of both power market potentials and future growth prospective. In order to contribute to an informed decision as to whether a European utility should enter the IPP business in Indonesia, this thesis analyzes the competitive market and non-market environments in Indonesia, identifies tangible sources for value creation, formulates an integrated business strategy and discusses risk exposures including effective mitigation measures.

Low electrification rates, a booming economy fueled by bountiful natural resources, and ever-increasing domestic consumption demand significant investments into new power plants to satisfy future levels of electricity consumption. Until 2020, the Indonesian power market will grow at an average rate of 10% per year, which translates into 60 GW of additionally installed capacity. The state-owned incumbent PLN will only be able to implement 40% of this required growth, and will therefore need to rely on local and international IPPs to fill the gap. To this end, the 2009 Electricity Law provides the regulatory framework for private participation in the generation of electricity. Other market mechanisms include the negotiation of Power Purchasing Agreements, in which the price per MWh is agreed upon between PLN and the IPP. The awarding of such contracts is organized via competitive tenders or direct appointments, depending on the technology, size, and location of the project. These processes however are often slow and opaque, and the non-market environment presents certain challenges for long-term investors. In brief, the Indonesian IPP market offers unique growth opportunities but requires a well thought-through approach to overcome such significant hurdles as corruption, bureaucracy, and protectionism.

In order to formulate an effective business strategy, value drivers of the IPP business model, local market needs and institutional voids in Indonesia are reviewed. As a result, the inherent difficulties in realizing large-scale infrastructure projects on-time and on-budget require the international know-how of experienced utilities. The distinct managerial and technical

capabilities of European power companies can address these inefficiencies by pursuing an integrated strategy based on differentiation. Such an approach includes the consideration of both market and non-market elements and builds on four pillars: (1) Capitalization on strong market fundamentals, (2) Leverage of core capabilities, (3) Establishment of key partnerships, and (4) Achievement of a relevant position in the market. Thereby, local companies that hold project portfolios but lack power market experience will be targeted to jointly launch an organic, growth-oriented strategy for building a portfolio of coal, gas, and hydropower plants. Accompanied by sophisticated stakeholder management, this shall lead to the achievement of a significant 5% market share (equivalent to approximately 5 GW) by 2020. Most importantly, calculated returns of generic power plants, between 10-14%, prove that based on current tariff levels there is indeed a business case for European energy firms in Indonesia.

Still, there are certain risks that must not be ignored. Above all, the non-market environment with its formal and informal networks of influential politicians, large business conglomerates, family clans, and non-government organizations need to be studied in detail. Access to these circles must follow a carefully drafted non-market strategy that involves provision of assistance to PLN in upgrading its existing power plant fleet, filling information-related institutional voids through sharing industry-specific developments with the government, and proactively sharpening the corporate profile of being a committed, trustworthy player. At its core, the value proposition not only rests on the largely performance-related capabilities of the power sector, but also on being able to adapt to local conditions without compromising good corporate governance, and substantially reducing the risk of delayed or even failed capacity additions. Finally, distinct risk management in the business, the physical, and the project environment will enable European energy companies to succeed in building profitable IPP businesses in Southeast Asia.

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1 Introduction

Established utilities in Europe currently face a three-fold challenge: (1) Growth rates are stuck between 0 and 2% in most European economies, (2) developed countries rely more upon innovation than (power-consuming) industrial output to boost their economies, and (3) new competitors with decentralized electricity generation have entered the arena to fight for their market share. However, emerging markets with as-yet untapped power generation opportunities hold significant potentials for European energy firms (EEFs) seeking internationalization. Southeast Asia (SEA) in general and Indonesia particularly suffers from power shortages due to constantly increasing demand. Additionally, hard infrastructure such as power plants requires extensive knowledge in order to be built efficiently and operated safely. In this context, the European incumbents' decades of accumulated experience in the power sector could be leveraged beyond existing markets with the objective to exploit new revenue streams through becoming Independent Power Producers (IPPs). Therefore, this thesis shall closely examine which, if any, approach towards the most favorable power market in SEA makes business sense and what such a business model and strategy for IPPs in Indonesia would look like.

In contrast to state-owned utilities, IPPs help governments reduce the capital-intensive funding requirements for renewing, upgrading, and expanding existing power plants and related infrastructure. Thereby, the private sector assumes an important role in increasing competition by promoting supply options in terms of technology and price, exploiting skills and capital from international sources, introducing the best operational practices, and contributing to sustainable developments in emerging markets. To safeguard their significant upfront investments, IPPs, classified as not being a public utility, seek power purchasing agreements (PPAs) with state-owned incumbents typically for a period of thirty years for both renewable and conventional power plant projects. First appearing in the United States (US) in the late 1970s, IPPs must qualify during a tender process executed by the respective country in order to receive a license to develop, implement, and operate power-generating facilities. Today, IPPs are common market players in developed countries' power sector and play and increasingly important role in meeting the power demand of emerging regions such as SEA.

From a global perspective, SEA is a region of high interest because of its "rapid economic growth, increasing energy demand, rising fossil fuel imports, growing environmental pressures, low rural electrification levels, and heavy reliance on fossil fuels and traditional biomass" (IEA 2010). Leaving the last effects of the Asian crisis during the late 1990s behind, not only have the so-called "tiger states" made a comeback, but the supposed second-tier group of countries in SEA is rising as well. Therefore, the next chapter summarizes these developments by analyzing the local business conditions in SEA with a special focus on Indonesia's market and non-market environments. The third chapter logically derives sources for value creation by IPPs by synthesizing the gathered information and combining it with typical resource and capability profiles of EEFs. The fourth part of this thesis describes the IPP business model in Indonesia and formulates a market entry strategy for EEFs. Chapter five critically reflects on the risk exposure of the IPP business and suggests concrete mitigation measures.

1.1 Objectives

From the perspective of a recently-appointed business development manager of an EEF aiming to enter the power market of an emerging country in SEA, the goal of this thesis is to (1) develop a thorough understanding of market and non-market environments in the energy (utility) business in SEA, (2) identify key drivers for creating sustainable profits in a particular country, (3) formulate relevant components of an effective business strategy and (4) investigate key aspects of active risk management for an IPP project. Overall, this thesis seeks to provide readers with valuable information in order to better understand the complexity of the Indonesian IPP market as well as the numerous opportunities it presents.

1.2 Scope of work

The boundaries of this work are clearly defined in terms of geographic limitations (ASEAN-5; countries listed in section 1.4), shareholder characteristics (state ownership of local incumbents and partial state ownership, if any, of EEFs), industry specifics (energy business, utilities), and technological focus (upstream business, that is electricity generation). The plant technology and size assumed in this study to be relevant for profitable market entries of EEFs are coal-fired, combined cycle gas turbine, and hydropower plants within a range of 400 to 1,000 MW

(thermal) and 30 to 500 MW (hydro). Based on empirical evidence, this combination of technologies and capacities has proven successful and beneficial in terms of the manageability of social, environmental, and economic risks. Once business relationships are established and tested in the region however, other (renewable) technologies as well as small (< 30 MW) and very large scale (> 500 MW) hydro developments might constitute the second step of a long-term growth strategy, but this falls outside the scope of this thesis.

Figure 1.1: Focus technologies – Thermal and hydropower plants[1]

Last but not least, state-owned utilities in emerging markets in general and in SEA particularly are vertically integrated across the whole value chain, including upstream (exploration and generation), midstream (trading, distribution) and downstream (wholesale and retail) business activities. Although IPPs are allowed to build their own transmission network and even to directly serve end customers in some countries, the content of this paper only deals with the core concept of IPPs, that is the generation and subsequent sale of electricity to the gird owner (usually the incumbent).

1.3 Methodology

The chosen approach to explore in-depth the paper's thesis statement is (a) built on a rich and diverse source of country analyses, industry databases, and market insights from consultancies. It applies, among others, recognized concepts for (b) developing a viewpoint for the prevailing non-market environment of the energy business and its impacts on strategy (Baron 1995, Coen 2005, Coen et al 2010), (c) and formulating an effective global strategy striving for value

creation under competitive conditions (Ghemawat 2007, Porter 2008). The synthesis of these tools can be seen as an architectural framework that guides the reader throughout the paper. Where applicable, the mentioned literature is used as a reference; it represents a solid and proven academic point of departure for taking the collective market intelligence and presented ideas and constructively applying them in the specific context and environment of EEFs actualizing IPPs in SEA.

To support such a multidisciplinary approach to assessing the opportunities that the IPP business model offers for EEFs, an integrated business strategy at the end of the study reflecting the general frameworks described above, shall link theory and practice, scholars and businessmen. However, critical reflections on the limitations of the chosen perspectives will conclude the paper in order to complement the underlying firm belief of the author that specific circumstances require specific solutions, and to identify and respect the extent of structured approaches' and methods' usefulness. Clearly, individual judgment, critical thinking, and common sense can be enhanced but should not be replaced by predefined formulas and basic answers. To summarize, the following areas of expertise form the intellectual background for this work:

- Global Business Environment (institutional and non-market relationships)
- Corporate Strategy (strategy development and formulation, competitive intelligence)
- Operations in the Energy Business (coal, gas, and hydro plants; risk management)

Inherently this thesis focuses on Southeast Asian governments, state-owned incumbents, IPP market mechanisms, and EEFs wanting to expand their operations by going global. A successful global strategy must pay close attention to the existing non-market environment; the business climate of one country may differ completely from that of another. Thus, global strategies that require substantial sources of finance need to account for these differences in a 'semi-globalized' world which, according to Pankaj Ghemawat (IESE Business School), is 'not so flat at all'.[2] Finally, the aim of this paper is not to describe the world as it should be or to discuss a utopian version of it, but as Prof. Simon Evenett at University of St. Gallen perfectly phrased it, 'to see the world as it is'.

1.4 Definitions

Captive power plant generates electricity primarily for the controlling entity's own consumption and also includes plants which are developed, built, and operated by IPPs to serve a single buyer or an industry conglomerate using the electricity for its own (production) purposes, e.g. mining, smelting of metals, or burning cement. Surplus electricity is often sold into the regional grid.

Coal-fired power plants convert the heat energy of lignite or hard coal combustion into mechanical energy via a so-called prime mover (e.g. a steam turbine) that operates a generator. Coal-fired power plants are designed for continuous operation and range from 300 to 1,000 MW in size. See Figure 7.1 in the Appendix for a schematic.

Combined cycle gas turbine (CCGT) power plants utilize gas turbines to generate electricity and use heat from the exhaust to produce steam that drives a steam turbine (combined cycle). Such plants are more efficient than other thermal power stations and produce less carbon emissions. CCGT plants are designed for fast starts and stops and are typically engineered in sizes of 400 MW per block. See Figure 7.1 in the Appendix for a schematic.

Efficiency-driven economies are able to found their economic development on several efficiency-enhancing pillars, namely higher levels of education and training, competition, labor market flexibility and the efficient use of talent, financial market development, technological readiness, and domestic and foreign market size. Reference countries in this economic cluster are Indonesia, Malaysia, and Thailand.

Factor-driven economies rely on a set of basic requirements as a source of growth; these are public and private institutions, transport, energy, and telephony infrastructure, the macroeconomic environment as such, as well as health and primary education. Examples for factor driven economies are Vietnam and the Philippines. According to the WEF (2012), the Philippines are in the process of becoming an efficiency-driven economy.

Hydropower is a source of electricity generation derived from the energy of water moving from higher to lower elevations on account of gravity. Hydropower can be "run of river" without a reservoir (typically base load suppliers), or can include reservoir storage capacity ("storage plants", typically used for peak demand). Special forms of the latter are "pumped-storage

plants", which are not only able to generate electricity but also to store electric energy by pumping water from a lower to an upper basin (balancing power providers). Hydropower plants are tailor-made to unique topographical conditions, thus ranging from small (< 10 MW) and medium (10-30 MW) to large (30-500 MW) and very large (500 MW) plants. Note that, in the absence of global standard, these scale categories are based on empirical clusters that are applied for the purpose of this study but do not necessarily coincide with the scales and terms used in country-specific regulation. See Figure 7.2 in the Appendix for a schematic.

Independent Power Producer (IPP) is a private entity which owns facilities that generate electric power for sale to utilities and end users.

Small Power Producer (SPP) is a privately-owned subset of an IPP usually operating renewable energy plants or co-generation units (decentralized combined heat and power plant).

Southeast Asia (SEA) is geographic region consisting of eleven countries: Brunei, Burma (Myanmar), Cambodia, East Timor, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand, and Vietnam. This thesis, however, only considers five of them due to their power market size and corresponding level of interest for EEFs. According to the IEA (2010), Indonesia, Malaysia, the Philippines, Thailand, and Vietnam (see Figure 2.1) will account for more than 80% of the energy demand growth in the region until 2030. All of them are members of the Association of Southeast Asian Nations (ASEAN), an economic union in the region, and they will thus be referred to as the ASEAN-5.

State-owned utility is considered to be a network-dependent company that provides electricity and in which a national or local government authority holds a controlling equity stake.

2 Understanding the Competitive Environment

In the 21st century, no company that wants to go global can afford to overlook SEA. With 560 million inhabitants in eleven countries (Brunei, Burma (Myanmar), Cambodia, East Timor, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, and Vietnam), SEA offers a steadily growing consumer base asking for more goods and services worldwide. Doing business in SEA however will be challenging, especially in terms of corporate governance and efforts to bridge the gap between cultures. Once these hurdles are overcome and by investing in resources with the objective of staying for at least 20 to 30 years, companies find vast opportunities, for instance in network-dependent infrastructure sectors, which provide a singular basis for long-term industrial output and growth. In order to better understand the business environment of SEA, this chapter will first examine market conditions from a macroeconomic and country risk perspective, followed by a power sector analysis with an individual focus on Indonesia. Second, the similarities and differences in the Southeast Asian non-market environment are reflected.

Figure 2.1: Geographic location of the ASEAN-5

2.1 Market environment

Tom Butler (2008), World Bank official, outlines the key success factors of IPPs, irrespective of technology or geographic region. He first suggests looking at project and sector fundamentals such as adequate tariff levels, consumer payment discipline, and competitive project cost. Secondly, balanced contractual arrangements and risk allocation as well as high standards of transparency should be achieved. Third, the regulatory environment, including government commitment to performance of the off-taker and an enforceable legal framework, plays a central role in deciding whether to enter, stay, or even exit the IPP market. Clearly, there are market and non-market issues woven into all three components that cannot be separated in a logical manner but should rather be seen as dynamic, challenging aspects of the power industry. Nevertheless, let us first analyze the market fundamentals, add a power market perspective, and conclude with IPP market mechanisms, before dealing with the non-market environment in chapter 2.2.

2.1.1 Macroeconomics

Electricity has the power to boost economies, but an undersupply can severely hold them back. Power shortages usually occur when private and industrial consumption grows at a pace faster than a government can facilitate. Still, many emerging markets rely on various state-owned enterprises to fill such a gap. Additionally, price subsidies come at the inevitable expense of new investments being postponed. For these reasons, IPPs will play a significant role in the future of SEA. Before embarking on their long-term journey, differences between local markets need to be critically considered in order to support an educated corporate strategy formulation and decision-making framework.

The power for growth

The question as to whether electricity supply enables income growth or rather that higher domestic income triggers more power consumption is a classic chicken-and-egg conundrum. The following comparison (see Figure 2.2) between gross domestic product (GDP) per capita and electricity consumption per capita however reveals a much more subtle aspect of this relationship than direct causality. Compared to Western countries, emerging economies tend to

consume more electricity than the actual level of their GDP would require in the long term. In other words, a short-term scenario suggests that the ASEAN-5 could move towards levels of electricity consumption per capita that match or even exceed those of the largest European economies without actually achieving the same level of income during that time frame.

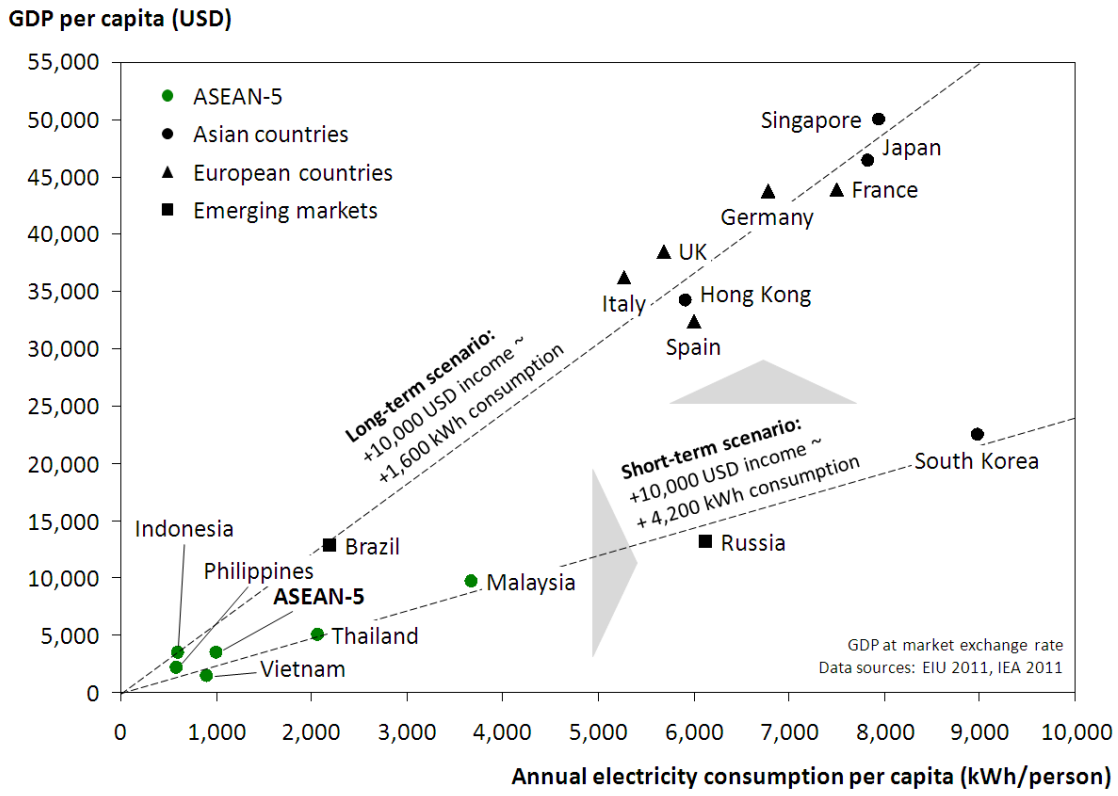

Figure 2.2: Correlation between GPD and electricity consumption

Indonesia, for example, suffers severe power shortages – a fact supported by the statistical data shown above. It suggests that in a short-term scenario the consumption pattern of Indonesians should be much closer to the ASEAN-5 average. Brazil, on the contrary, seems to be already moving along a long-term scenario, where an additional 10,000 USD in GDP per capita (at 2011 market exchange rate) would translate into an additional annual consumption of approximately 1,600 kWh. Even using the most basic data and given that no long-term studies can predict the exact development of individual countries, one relevant conclusion for the purpose of this study is that the aspired Southeast-Asian growth in GDP will be accompanied by a significant increase in demand for electricity, which directly relates to higher demand for new power plant

facilities to be developed, built, and operated by capable IPPs. Before diving into the power market's size and characteristics however, this chapter will look at other macroeconomic indicators.

The ongoing growth of electricity consumption per capita increases the demand for electrical power, while at the same time underlying macroeconomic and demographic data predicts an increase in the size of the total market. More than half a billion people live within the geographical borders of ASEAN-5, a fact that highlights a demand-driven growth path to prosperity. Though Indonesia outperforms its neighbors in terms of both overall GDP and growth perspectives during this decade, other metrics like GDP per capita, unemployment rate, and level of inflation, are significantly better in Malaysia and Thailand, the two most developed countries of the ASEAN-5. These and further macroeconomic indicators are summarized in Table 2.1.

Table 2.1: ASEAN-5 macroeconomic key data

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Annual data 2011						
Population (m)	**532.9**	245.6	28.6	101.8	68.2	88.7
GDP (bn USD; market exchange rate)	**1,820**	847	279	225	346	124
GDP (bn USD; PPP)	**2,864**	1,125	447	390	602	300
GDP per capita (USD; market exchange rate)	**3,416**	3,448	9,738	2,207	5,068	1,400
GDP per capita (USD; PPP)	**5,373**	4,579	15,629	3,834	8,820	3,384
Historical annual averages 2007-11 (%)						
Population growth	**1.3**	1.2	1.3	2.0	0.9	1.0
Unemployment	**5.6**	7.8	3.2	6.9	0.9	2.5
Inflation	**5.9**	6.3	2.6	4.8	2.8	13.2
Real GDP growth	**4.9**	5.9	4.3	4.6	2.5	6.5
FDI inflows (% of GDP)	**2.5**	1.7	3.3	1.0	2.7	8.5
Projected annual growth 2011-20 (%)						
Growth of real GDP	**5.4**	6.0	4.9	5.6	4.4	5.5
Growth of real GDP per capita	**4.1**	5.0	3.4	3.8	3.8	4.5

Sources: EIU 2012, tradingeconomics.com (unemployment rate)

Country Competitiveness

Another measure of a country's macroeconomic performance is the Global Competitiveness Index (CPI) published by the World Economic Forum (WEF); it provides a useful subset of indicators relevant to IPPs in SEA. The rankings in Figure 2.3 form a solid empirical basis for assessing comparative advantage and gaining a first impression about the individual strengths of the target countries. Malaysia and Thailand seem to have the most competitive environments,

followed by Indonesia, Vietnam and the Philippines. Upon further examination, the data reveals that in basic requirements and efficiency enhancers, Malaysia leads the group or is at least close to the top ranking, especially when all countries perform similarly in categories such as macroeconomic environment and market size. Clearly, the Philippines lose ground in the areas of infrastructure and institutions. The latter will be assessed in more detail in the following sections; however the former could be interpreted as a positive opportunity for IPPs, as a lack of infrastructure includes a lack of power plants, which form the basic market needs that IPPs aim to satisfy. This upside could yet be outweighed by the difficulties that often-remote locations and a lack of roads, railroads, and telecommunications pose, all of which make it more challenging to develop IPP projects in such a macroeconomic environment.

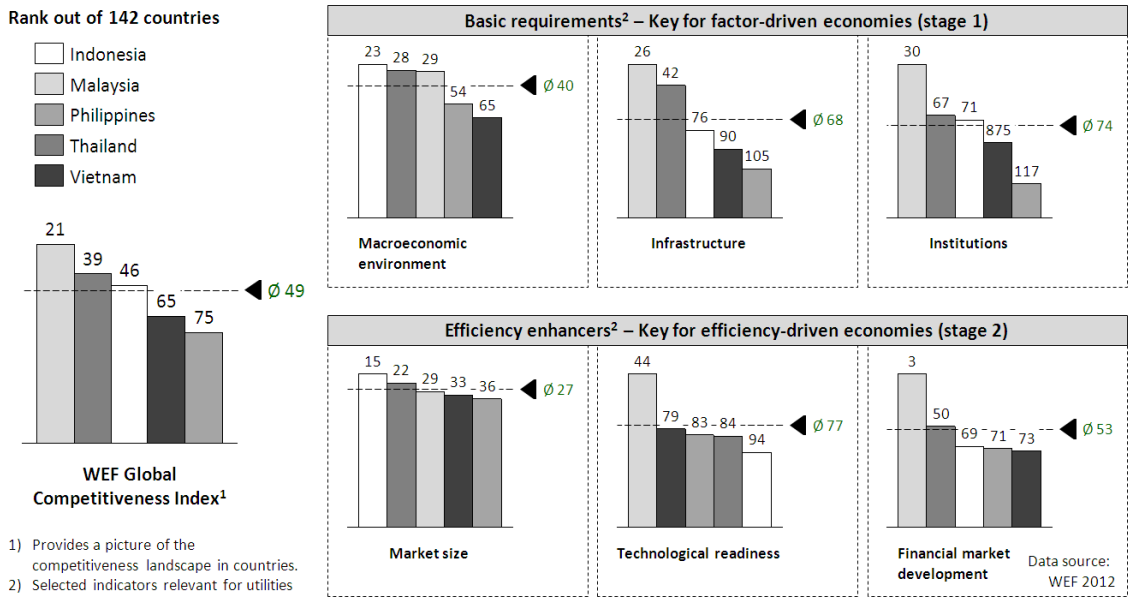

Figure 2.3: Global Competitive Index[3]

Foreign Direct Investment (FDI)

The historical development of foreign direct investment gives further insights in assessing a market's functionality because it indirectly illustrates how the business environment of a country changed over time in comparison to other countries in SEA. In this respect, Indonesia has recently made significant improvements, becoming the regional leader in FDI and leaving Thailand, Malaysia and Vietnam behind. Unsurprisingly, the Philippines account for remarkably

low levels of FDI, constraint by the overall non-market business conditions as outlined by the World Bank's Doing Business Ranking to be examined later.

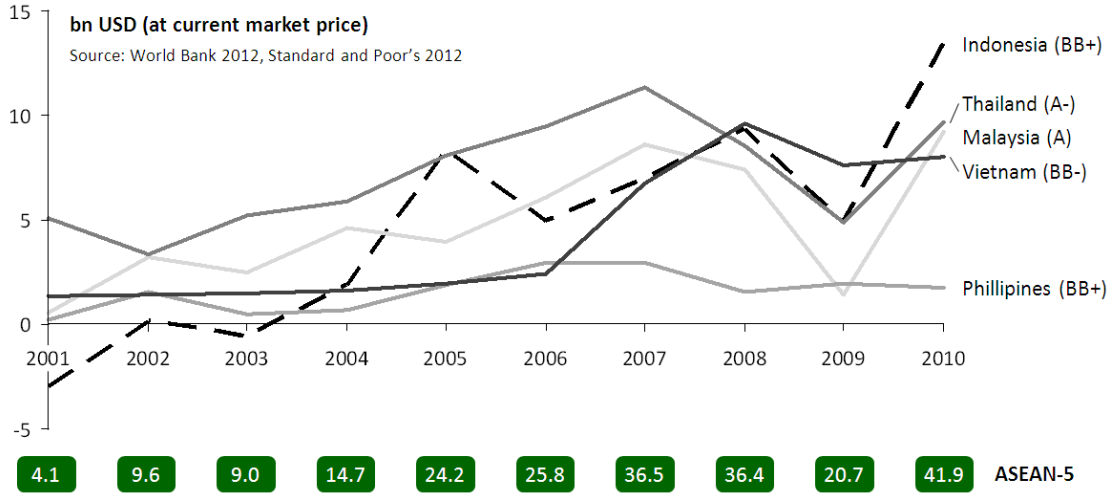

Figure 2.4: Foreign direct investment inflow 2001-10 and credit risk rating

As shown in the figure above, Indonesia took the lead in attracting investment from abroad mainly due to its vast natural resources and its cheap labor force. FDI from China increased significantly and sectors like mining and energy accounted for nearly half of the 13.4 bn USD figure in 2010, making Indonesia to 20th largest recipient of foreign investment. Trailing Indonesia are Thailand, Malaysia, and Vietnam, each of which received cash inflows between 8 and 10 bn USD in 2010. Malaysia and Thailand both benefit from their traditional links to Japanese companies which are continuously investing in local production facilities for such items as automotive parts and electronics. Likewise, Vietnam was able to raise money abroad at a regionally competitive level through its industry and infrastructure sectors. Only the Philippines could not keep pace with its neighbors; its poor performance along many of the competitiveness metrics is further confirmed by moderate FDI figures. Nevertheless, privatization and market liberalization efforts triggered some investments in the electricity sector in the past.[4] FDI can be interpreted as a direct market response to local competitiveness and the comparative advantage of nations, and the reasons for performing well on this measure are deeply rooted in the macroeconomic strengths and weaknesses of the respective economies, something that the next section will further elaborate on in regards to Indonesia.

Indonesia – A macroeconomic view[5]

The intrinsic strength of the Indonesian market lies in its sheer size, including its vast amount of natural resources, and its young and productive population. The biggest economy in SEA, Indonesia is a member of the G20, the twenty major economies in the world, and is expected to join the G10 by 2020. During the Asian Financial Crises of the 1990s, Indonesia experienced a sharp setback on its way to becoming a leading industrial nation (see Figure 2.5). Today however, its impressive growth path continues upward, mainly on account of the commodities boom (6th net exporter of natural gas and 2nd net exporter of hard coal) and domestic consumption (approximately 50% of GDP). The country's middle class is increasing quickly, rising from 1.6 m in 2004 to roughly 50 m in 2011, which in terms of affluent individuals makes it larger than India's middle class. Geographically, Indonesia also controls large fresh water reserves, farmland for food supply and, above all, space to further grow and provide SEA with vital natural and human resources.

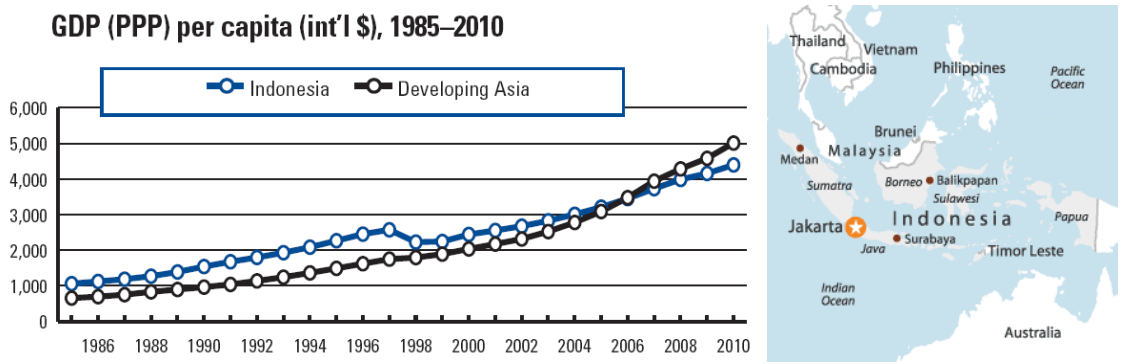

Figure 2.5: Indonesian GDP per capita development 1985-2000 and country map[6]

Indonesia does have to deal with insufficient infrastructure, notably poor roads, ports, and power facilities, and an abundance of natural resources and bureaucratic hurdles delay needed investments in new technology to modernize the domestic industry. In conclusion, the economic risk of entering the market can be assessed as medium, considering its sound macroeconomic fundamentals, its promising growth rates and a relatively stable local currency. Still, new market participants should closely monitor economic indicators in order to prepare managerial decisions and, if necessary, adapt the business strategy to changing realities.

2.1.2 Power sector analysis

As demonstrated previously in the macroeconomic review of the ASEAN-5, power supply is of pivotal importance to the facilitation of economic growth. The region's energy sector has expanded rapidly and will continue to grow at an even greater pace in the future (see Figure 2.6). Most of this growth however will take place in Indonesia and Vietnam, together accounting for more than 75% of total additional capacity needed by 2020. Furthermore, 94 million people have no access to electricity; the majority of them are distributed throughout the Indonesian archipelago. According to IEA (2011), electrification significantly helps to alleviate poverty and should be a top priority for every nation. Therefore, the following power market review touches upon the most relevant aspects of linking power supply and demand in Indonesia. Given the inherent dominance of state-owned incumbents, the analysis takes into account the development plans of the national power market and focuses on IPP opportunities in order to answer the primary question of this study.

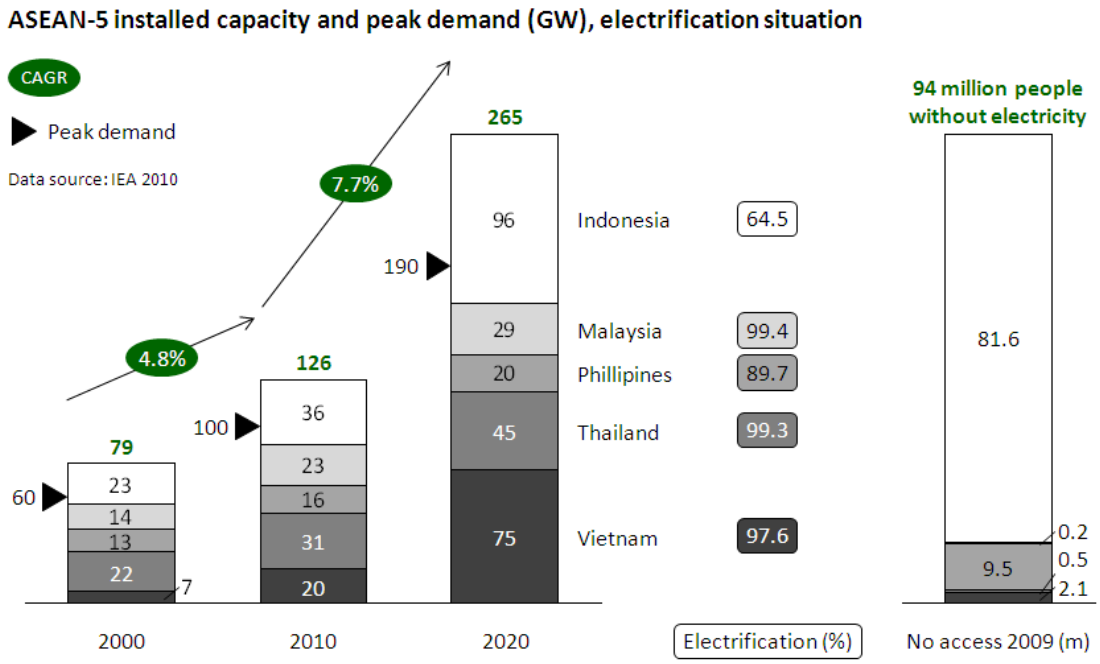

Figure 2.6: ASEAN-5 power market size and electrification rates

Summarizing the brief power market analysis of the ASEAN-5, it can be stated that Indonesia offers the most attractive opportunities for EEFs in terms of both future market size and

absolute share of IPP participation. Similarly, Vietnam must implement a tremendous energy growth program, practically identical in size to Indonesia's, if it wishes to keep track of its economic potential and meet the upcoming enormous increase in domestic demand. The current shortage in Vietnam however is not only related to limited generation capacity but also to a poor tariff regime and a lack of gas supply. For illustrative purposes, Figure 2.7 shows the correlation between anticipated GDP growth and power market development, emphasizing both current (2010) and future market size (2020). It is thus clear that Malaysia and Thailand offer only limited opportunities; the Malaysian market is close to saturation, and the Thai market is restricted on account of its increasing reliance upon electricity imports from Burma (Myanmar) and Laos, and the fact that a large number of IPP projects have already been assigned. Finally, the Philippines only account for 3% of future growth in the region, a meager proportion that does not justify a single market strategy on the part of EEFs, even though much of this capacity will be met by IPPs.

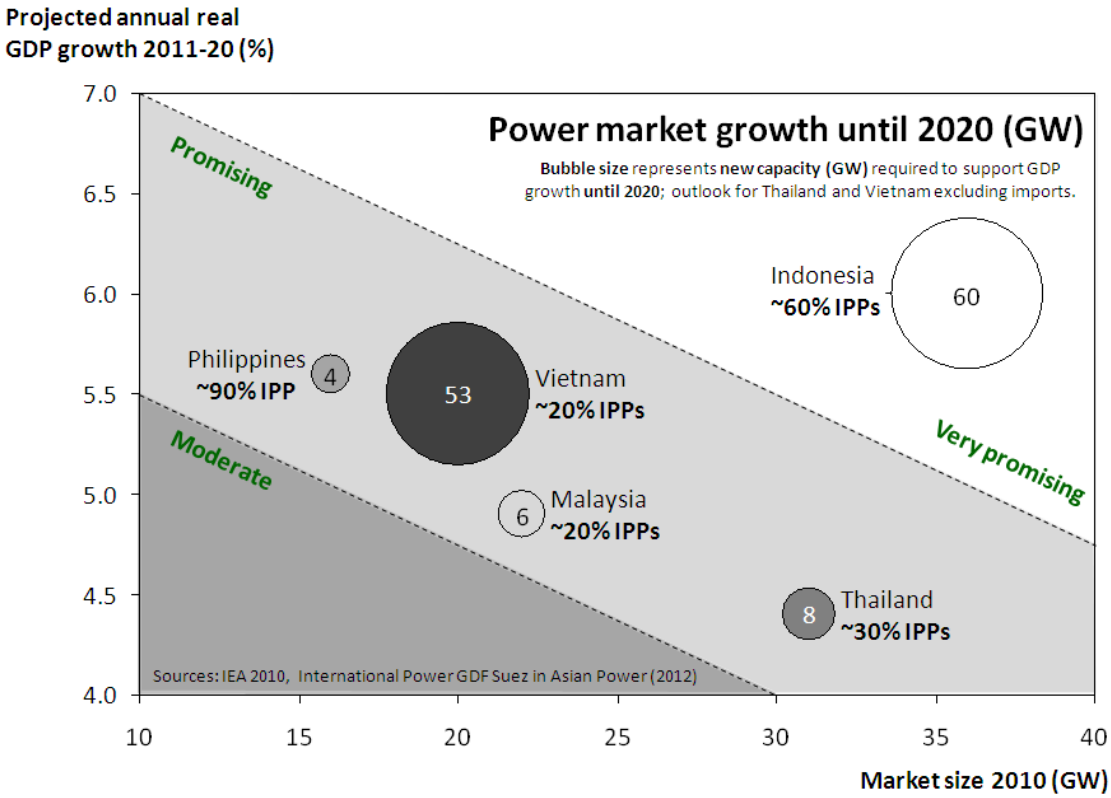

Figure 2.7: Correlation between projected GDP growth and power market development

The power of Indonesia

Indonesia, the largest economy in SEA, needs a reliable electricity supply to power its economic growth. Shortages in generation capacity are attributable to aging plants and quickly rising demand, at an estimated annual growth rate of more than 10% (see Figure 2.8). Not only are outages common in rural areas, but rolling blackouts must also be scheduled across the heavily populated Southern islands Java and Bali in order to avoid total blackouts during demand peaks. Electrification is currently at only 65%, leaving more than 80 million people without basic access to electricity. Four main reasons have contributed to the current undersupply situation in Indonesia[7]:

- Low utilization of primary energy resources combined with a lack of physical infrastructure (e.g. gas pipelines, coal transportation routes) to bring the feedstock to the generation assets (e.g. in Sumatra);
- Opaque land acquisition processes, including rights to clear property;
- An insufficient regulatory environment incapable of enabling international project finance or providing sovereign guarantees to developers;
- Missing market incentives due to the level of government backing for low retail and wholesale electricity prices.

The current total installed capacity amounts to 36 GW producing 168 TWh per year (2010), mainly from coal-fired plants (45%), oil and gas-fuelled stations (each 25%), and hydropower plants (5%).[8] There are also a significant number of off-grid generation units installed because (a) interruptions in supply are costly for factories, (b) public facilities require emergency backups, and (c) grid infrastructure is often not available in rural areas. This off-grid supply is comprised of small diesel generator sets, solar panels, and small-hydro facilities totaling more than 6.4 GW. The power network consists of eight domestic interconnected systems and approximately 600 isolated grids, which are all operated by the state. Unlike Thailand, Indonesia has little opportunity to import electricity due to the physical constraints of the archipelago. Additionally, transmission losses and electricity theft close to 11% remain issues in the country. [9]

As presented in the introductory section of this power sector analysis, Indonesia's power market size is likely to reach about 96 GW by 2020. Almost 80% of these 60 GW will be provided by thermal units (coal and gas-fired power stations), and hydro and renewables (mainly geothermal power plants) will contribute the remaining new capacity (see Figure 2.8). Geographically, most of the demand will come from Java, Bali and, to some extent, Sumatra. After deducting existing capacity, already planned projects by competitors as well as projects currently under construction, the remaining IPP market potential until 2020 is estimated to be 25 GW. There is a significant chance that this number could grow, as not all currently planned projects will succeed and potential partners might be willing to share project developments in exchange for sector know-how, risk sharing, and capital injections. A more detailed view on competitors' specific project pipelines is presented in section 2.2.3.

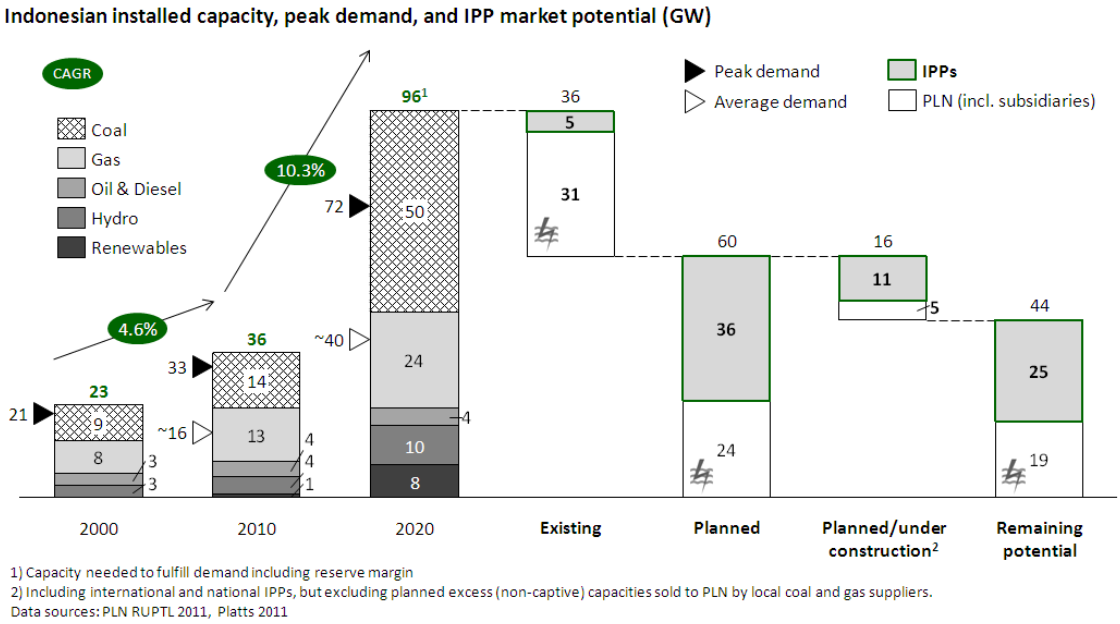

Figure 2.8: Projected Indonesian power market size including potential IPP share

Electricity subsidies

Oil, gas and coal revenues account for approximately 35% of the government's income, which is then directed to domestic energy subsidies that include electricity. According to the state-owned utility PT Perusahaan Listrik Negara (PLN) (2012), the Government of Indonesia (GOI) spent 9.9 bn USD to support the regulated tariff regime in 2011. Furthermore, PLN has an

increasingly difficult cash flow problem and receives annual support by the GOI in assistance; in other words, electricity in Indonesia is sold below generation cost and subsidized by approximately 40%. As power generation increases however, the rising cost of subsidies will ultimately squeeze the GOI's capacity to repress power tariffs. The IEA (2008) strongly opposes market price distorting subsidies as being counterproductive to the development of the electricity sector: "Retail prices of electricity […] below cost making it difficult for the industry to draw private investment which is a main cause for chronic power shortages and regular outages", as high officials in SEA confirm (Laykin 2009). Therefore, the gradual removal of distorting price subsidies and caps, accompanied by social programs to cushion the impact on the poor, will fund the required upgrades of infrastructure, create jobs, and contribute to a rise in living standards. Additionally, foreign IPPs would have even more incentive to actively participate in the market's development. In reality, however, introducing market capitalism and competition to a sector that in most parts of the world is state-protected is likely to be difficult, especially in a formerly autocratic, centrally-planned economy. Still, "pricing" remains the most critical issue for both Indonesian customers and producers.

The "New IPP Order"

In recent years the GOI has made efforts to significantly improve the investment environment for IPPs. On the one hand, the current power development plan (RUPTL) creates space for IPPs, and is supported by the Indonesian Infrastructure Guarantee Fund (IIGF), which reduces the risk premium associated with PPAs. On the other hand, the government has loosened PLN's control of power over the value chain by breaking its monopoly on distribution (though the Electricity Law No. 30/2009). On the demand side, a gradual shift from regulated tariffs to market prices for end user electricity shall further lower PLN's reliance on subsidies and attract private companies to invest in Indonesia's power sector.[10] The state-owned incumbent still holds a monopoly on the transmission and distribution of electricity, but it lost part of its market power in the generation business, where PLN operates about 86% of the domestic capacity.[11] Despite ambitious plans to expand power generation capacity, PLN continually falls short of implementation targets due to its lack of financial means and corporate governance issues. These factors, summarized in an overview of the power market structure in Figure 2.9, create significant opportunities for IPP players in Indonesia.

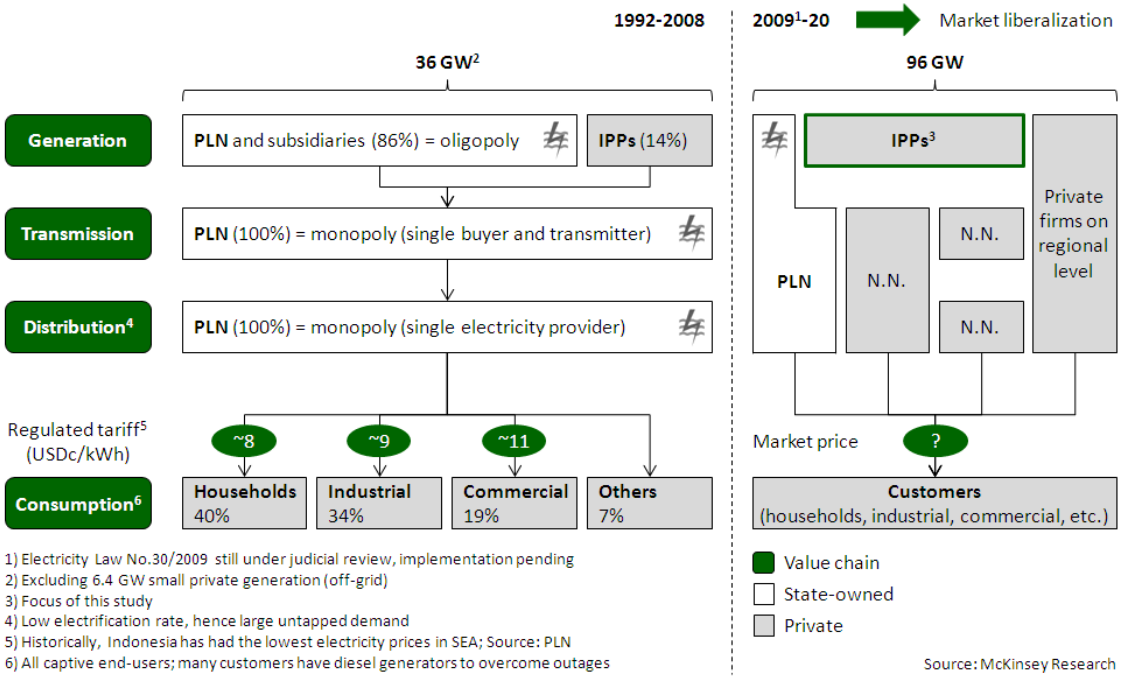

Figure 2.9: Indonesian power market structure post 2009 reform

Launched in 1992 and 2005, the first two generations of private participation in the power sector of Indonesia failed, despite promising returns on investments, for three fundamental reasons. First, the government did not guarantee PLN's commitments under the agreed risk sharing scheme; second, a rather opaque method of awarding PPAs through bilateral negotiations became market practice; and third, the Asian crisis of the 90s lead to the majority of first generation contracts being terminated because PLN could not fulfill its payment obligations, and thus renegotiated its signed PPA prices[12] (a move that destroyed investors' confidence for almost a decade). With the policy changes of 2009, however, the third IPP generation is built on (1) a more balanced risk allocation (by introducing the GOI as a financial guarantor for the (bankrupt) incumbent and off-taker PLN, (2) competitive auction processes (thermal power plants) and direct appointment (hydropower plants), as well as (3) macroeconomic stability and institutional reforms to the electricity sector (market liberalization efforts). The following table provides a detailed overview of the risk allocation, expectable returns, and performance of the two previous and the current IPP frameworks in Indonesia.

Table 2.2: Performance and risk allocation of the three IPP generations in Indonesia

	First generation	Second generation	**Third generation**
Performance			
Time frame	1992-98	2005-08	**2009 onwards**
IPP capacity addition	~4 GW	~0 GW	**11 GW**[1]
Returns	20-25%	12-14%	**12-14%**
Risk			
Fuel supply	IPP	IPP	**IPP**
Fuel cost	IPP	IPP	**IPP**
Site selection	IPP+PLN	IPP+PLN	**IPP+PLN**
Capacity and energy price risk	PLN	PLN	**PLN + GOI**
Construction	IPP	IPP	**IPP**
Operational	IPP	IPP	**IPP**
Foreign exchange	PLN	PLN	**PLN + GOI**
Country and regulatory risk	IPP	IPP	**IPP + GOI**

1) Planned capacity and under construction

Source: PWC (2011)

In conclusion, all power sector developments seem to point in the right direction. The GOI has opened the power market to IPPs and encourages private investment in infrastructure. But although incentivizing mechanisms and standardized PPAs are in place, IPPs still need to overcome institutional obstacles in their negotiation as well as in obtaining licenses to develop, build, and operate (see section 2.2). In addition, PLN will continue to dominate the market through a "first right of refusal", limiting IPPs to serve only areas that it has neglected. Clearly, the national Indonesian incumbent constitutes a key player that must be addressed in both market and non-market strategies. The following paragraphs will therefore concentrate on market mechanisms that organize the interaction between the participants.

2.1.3 Market mechanisms

In principle, the market mechanisms that IPPs can capitalize upon are similar throughout the different nations of SEA. These processes are usually organized around a state-owned incumbent utility that enjoys monopolistic advantages, a strong government with regulatory bodies on several jurisdictional levels, as well as domestic and foreign public and private customers. The following overview of the power market players and mechanisms helps to better understand the competitive environment before investigating non-market implications.

Learning from the past

IPPs have a long history in SEA. In the early 1990s, both American and European utilities brought the aforementioned business model to Asia in order to fill the power supply gap. Price adjustments were built into the PPAs addressing variable fuel costs, inflation, and exchange rates. However, the Asian Financial Crisis ended the rise of international IPPs in SEA, resulting in prevailing power shortages. Three main factors brought the IPPs to a halt: first, though in principle foreign exchange rate risk was aptly considered in contracts, they were definitely not designed to deal with depreciations in local currency (such as the Indonesian Rupiah) of more than 1,000%. Second, most developers used best-of-class equipment that enabled high generation availability of more than 95%, however in the absence of tariff structures that remunerated power suppliers for their reserve or balancing power, companies suffered long payback periods which could have been at least partially avoided by using cheaper local equipment. Third, being able to only sell to the incumbent exclusively on his terms for twenty to thirty years bore a substantial risk for developers. Today selling to the state-owned utility is still the most common form of the IPP business model, but Asian policymakers now allow private companies to also provide power independently to both retail and wholesale customers. Still, investing in large-scale infrastructure will always remain a long-term venture, and all contractual parties need to acknowledge this fact in order to equally share risks and opportunities.[13]

The classical model

IPP projects are usually organized, implemented and operated by a Special Purpose Vehicle (SPV) that governs a variety of contracts. The documents to be negotiated and managed by the owner/developer typically include a Shareholder's Agreement (SHA), a Concessions Agreement (CA), a Power Purchasing Agreement (PPA) for domestic or foreign sale, Land Acquisition Documents, Engineering-Procurement-Construction Agreements (EPC contracts), Operating and Management Contracts, a Long Term Fuel Supply Agreement (to secure coal and gas resources), Project Financing Documents (loan agreements) and Security Documents (guarantees and insurance certificates). Figure 2.10 displays the contractual agreements and obligations of the classical IPP project structure.

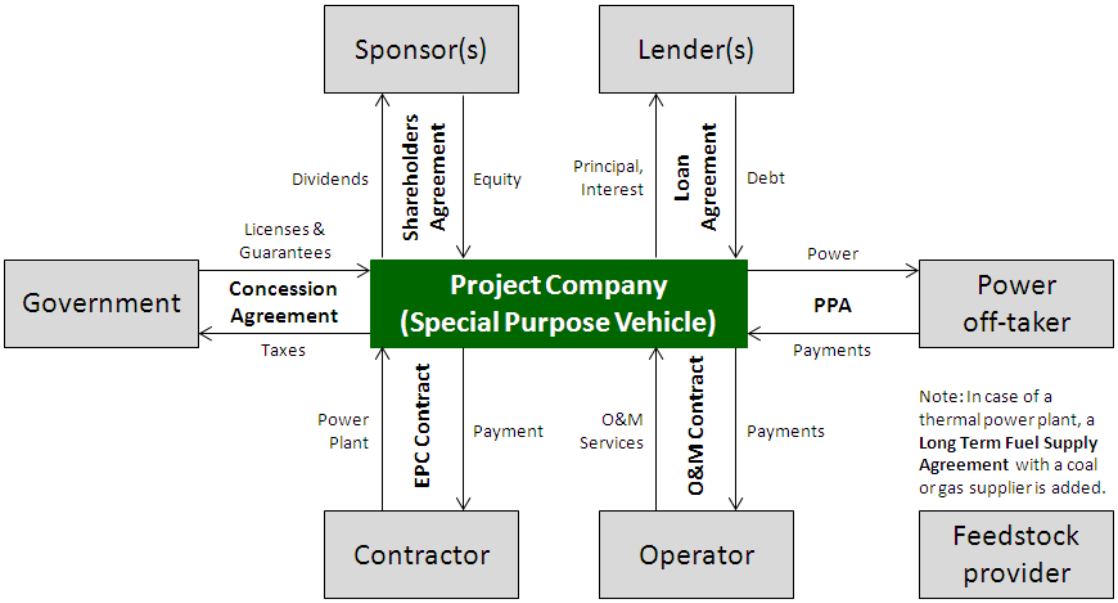

Figure 2.10: Standard IPP project structure

Applying the IPP concept

In Indonesia, IPPs have four different business partners and private customers to sell electricity to, namely (1) regional governments by using a PPA or entering into a Public Private Partnership (PPP) with local governments, (2) PLN through the sole use of a PPA, (3) end users at current tariffs and in connection with the permission to build their own transmission and distribution network, and (4) businesses (e.g. in the mining or steel industry) that receive captive power for a negotiated price. Especially in rural areas, the liberalization of direct cooperation with regional authorities shall advance electrification. The following figure summarizes the market participants of the Indonesian power sector, their interrelationships and trading activities.

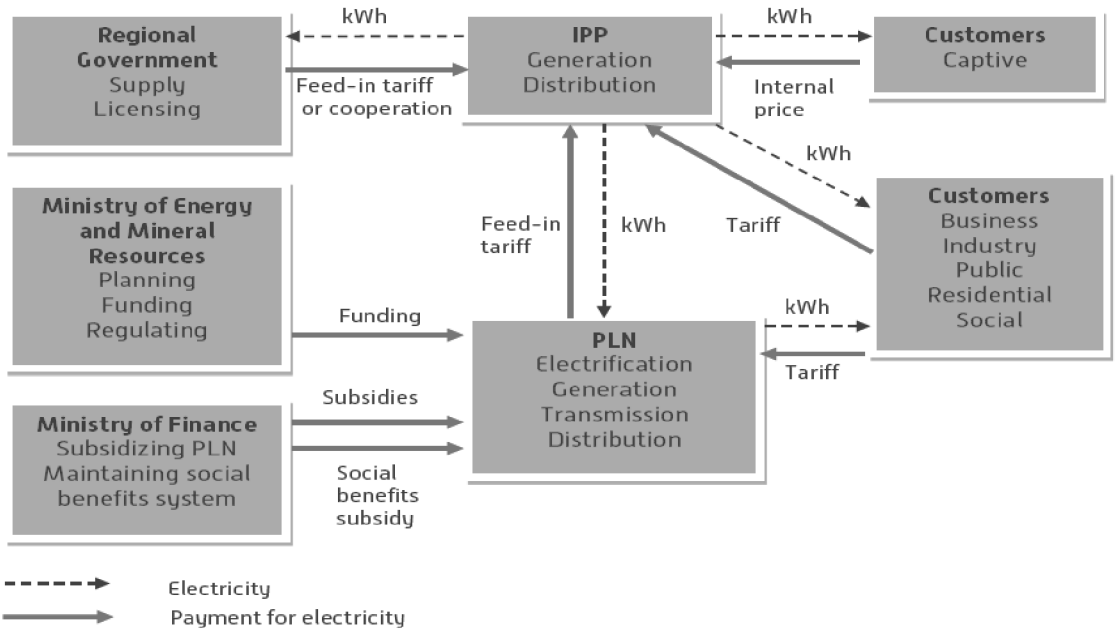

Figure 2.11: The organization of the Indonesian electricity sector[14]

IPPs in the Indonesian market agree to either serve areas that are outside of PLN's electrification program or, in regions where PLN is already present, exclusively sell electricity to PLN. To some extent this partial liberalization regulation erodes the monopoly of PLN, but on the other hand it prevents direct competition between the incumbent and new market participants. Furthermore, foreign and domestic bidders for licenses must adhere to a "Local Content Level" of a minimum of 35% when building and operating power plants, grids, and related infrastructure.[15] In short, the liberalization of the power market has begun slowly, but will take at least another few years to further take shape. A detailed overview of the concrete roles and responsibilities of PLN, the regional authorities, and IPPs can be found in section 2.2.2.

All things considered, it can be stated that from a power market perspective Indonesia is the most promising country of the ASEAN-5 because of its strong macroeconomics, its rapid electricity demand growth, and its emerging market mechanisms for private sector participation. Problems still exist, but are eventually manageable.

2.2 Non-market environment

Having analyzed the market environment, this section now focuses on the non-market environment by shedding light on the prevailing factors influencing an educated decision-making process and their social, political and legal implications.

2.2.1 Ease of doing business

The World Bank annually benchmarks the effectiveness of a country's market environment against other nations' performance in how they support companies doing business. The following figure reveals that within our target group in SEA, Thailand and Malaysia are the top performers, followed by Vietnam and Indonesia. Although "the ranking on the ease of doing business, and the underlying indicators, do not measure all aspects of the business environment that matter to firms and investors or that affect the competitiveness of the economy, […] a high ranking does mean that the government has created a regulatory environment conducive to operating a business." (World Bank, 2012).

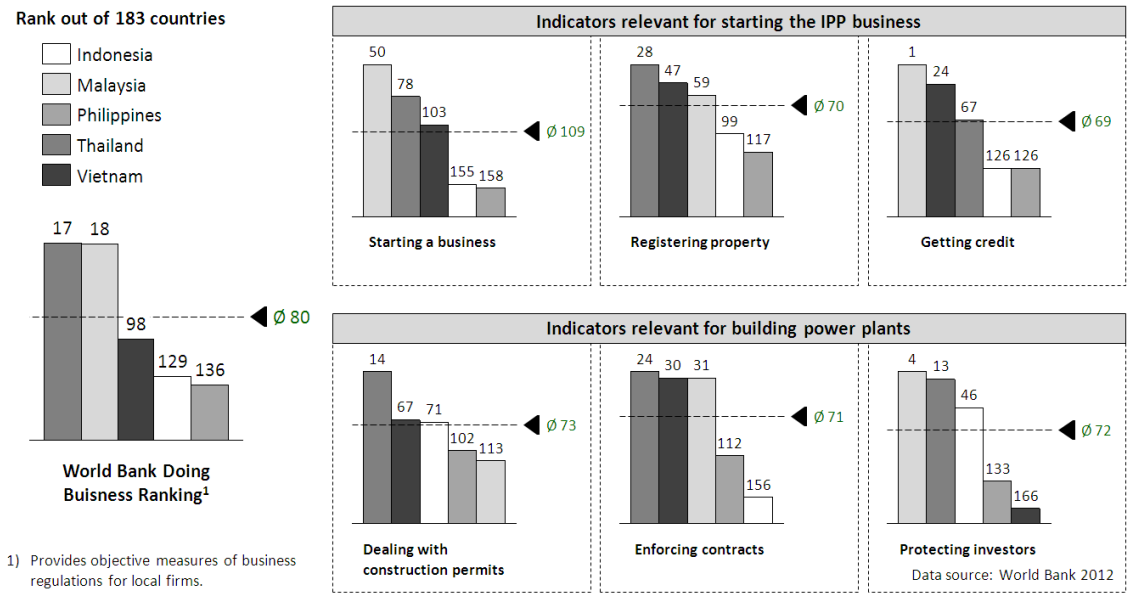

Figure 2.12: World Bank Doing Business Ranking

Reviewing the results of this global ranking, it becomes obvious that there are great differences between members of the ASEAN-5. First, starting an IPP business is much more difficult in Indonesia and the Philippines than in the other three countries. Malaysia for instance does exceptionally well in providing credit and protecting investors – attributes that are important to the constructions of capital-intensive power plants. A low performance rating in enforcing contracts is indicative of weak legal institutions and reminds IPPs to carefully select the place of arbitration, for example in Singapore, rather than Jakarta. Consequently, the correlation between institutional strength and regulatory processes allows deeper insights as to the relative strengths and weaknesses of the non-market environments throughout SEA. The graph below confirms the strong institutional performance of Thailand and Malaysia at relatively low costs of processes due to simple and efficient procedures. Unsurprisingly, the countries with the largest power market growth potential will need to develop their institutions at a correspondingly rapid pace in order to realize their ambitious targets with the help of IPPs.

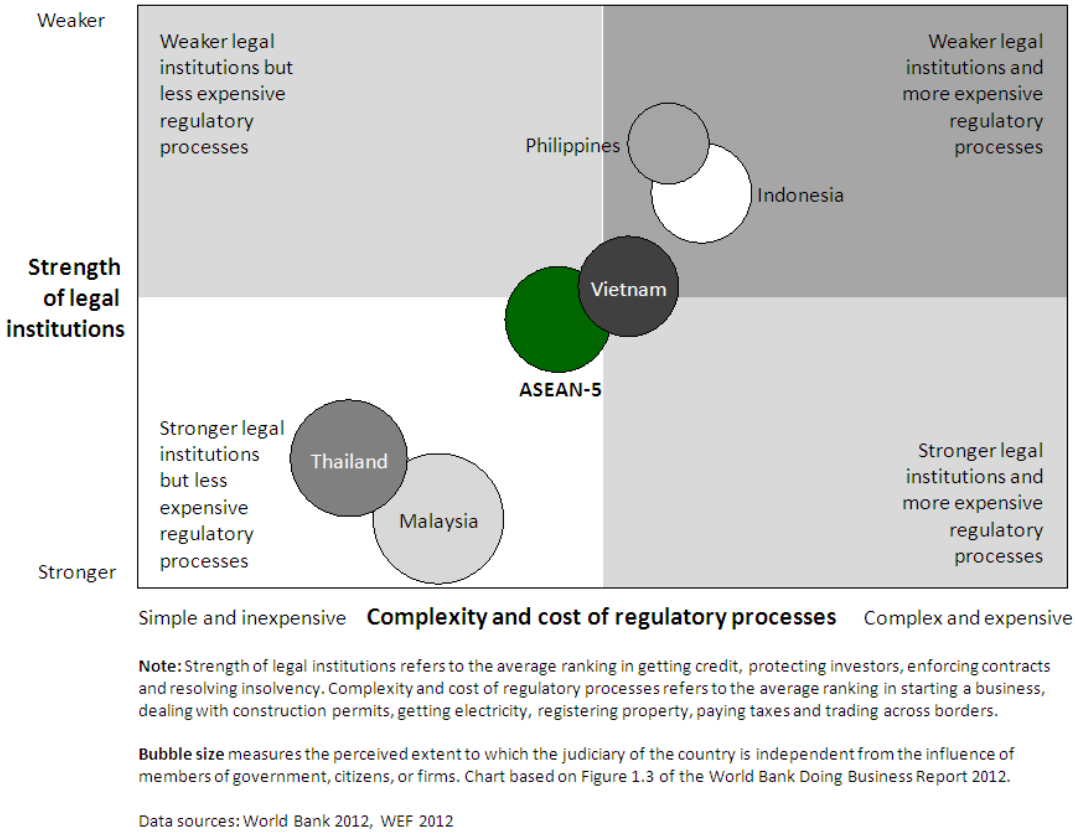

Figure 2.13: Correlation between institutional strength and regulatory processes

With respect to the purpose of this study, "Getting Electricity" is also an interesting sub-parameter in the "Doing Business Ranking" because it indirectly measures the bureaucracy involved in dealing with public utilities. In enterprise surveys from 2006 to 2010, the World Bank identified "getting electricity supply" as one of the major obstacles that operation managers face around the world (see Figure 7.4 in the Appendix). The ranking is therefore concerned with the procedures, time and cost necessary to obtain a new electricity connection for a given warehouse in the largest city of the respective country. As displayed in Figure 2.14, Indonesia performs particularly poorly in this category, which reflects a costly and lengthy process with the state-owned power company. This statement builds on the assumption that numerous institutional hurdles to connect end customers to the grid are indicative of a general complexity of internal decision-making on the power procurement side.

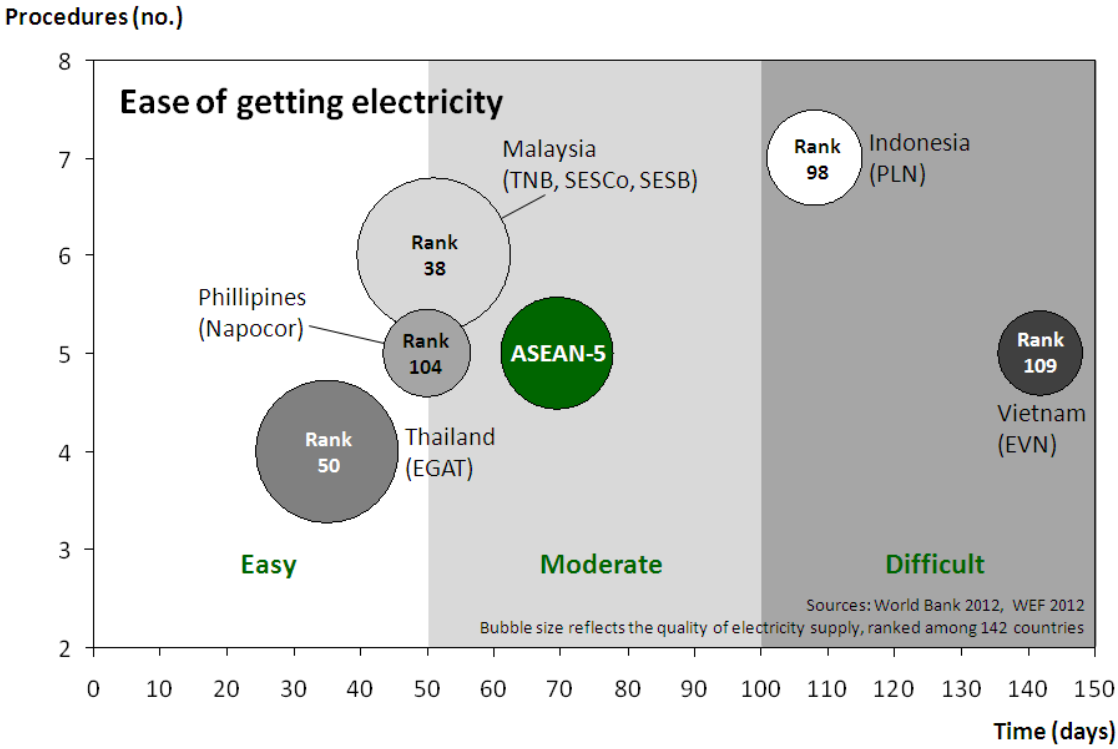

Figure 2.14: Ease of getting electricity in SEA

In general, one can assume that the ease of getting electricity for a certain warehouse owner in a given country in SEA is a useful indicator for the ease of doing business with the respective state-owned utility. First, it can be assumed that the electricity provider is well organized and

efficient if the company quickly executes a relatively small number of procedures. By contrast, a power monopolist acting in a bureaucratic and therefore inefficient manner will take more time to connect new customers to the grid. Guided by these assumptions, IPPs can gauge the relative difficulties in dealing and negotiating with a national utility compared to doing business with other incumbents in SEA. This analysis is based on the assumption that their purchasing departments act in a similar fashion to their sales departments; indeed the prevailing corporate culture will to some extent exert influence over employees and decision-makers alike, especially concerning adherence to formality and timeline implementation. Both aspects at least help IPPs to set expectations and to prepare for more lengthy and complex interactions with PLN and Electricity of Vietnam (EVN) than in other SEA countries. Hence strategies for dealing with the incumbent's bureaucratic procurement department must be developed.

Hurdles for doing business

In a recent executive opinion survey, the WEF (2011) asked senior managers, decision-makers, and expats of international companies what they perceive as the biggest difficulties in doing business in specific countries in SEA.[16] As shown in Figure 2.15, the survey lists corruption, inefficient government bureaucracy, and policy instability as the most troublesome issues. Despite the many factors that are generally relevant to businesses, EEFs looking for potential market entries should, in addition to the aforementioned top three factors, focus on those that are particularly relevant for IPPs such as inflation, government instability/coups, and foreign currency regulations. The category "inadequate supply of infrastructure" not only indicates a threat but also a business opportunity, from the perspective of meeting already-lacking supply. If companies have the capability to overcome these hurdles more quickly and successfully than others, they will be rewarded with competitive advantage. Based on the information collected by the WEF, Indonesia and Malaysia present a fairly balanced set of challenges to the IPP business, whereas the Philippines (corruption), Thailand (government instability/coups), and Vietnam (inflation) force severe, singular difficulties on future IPPs.

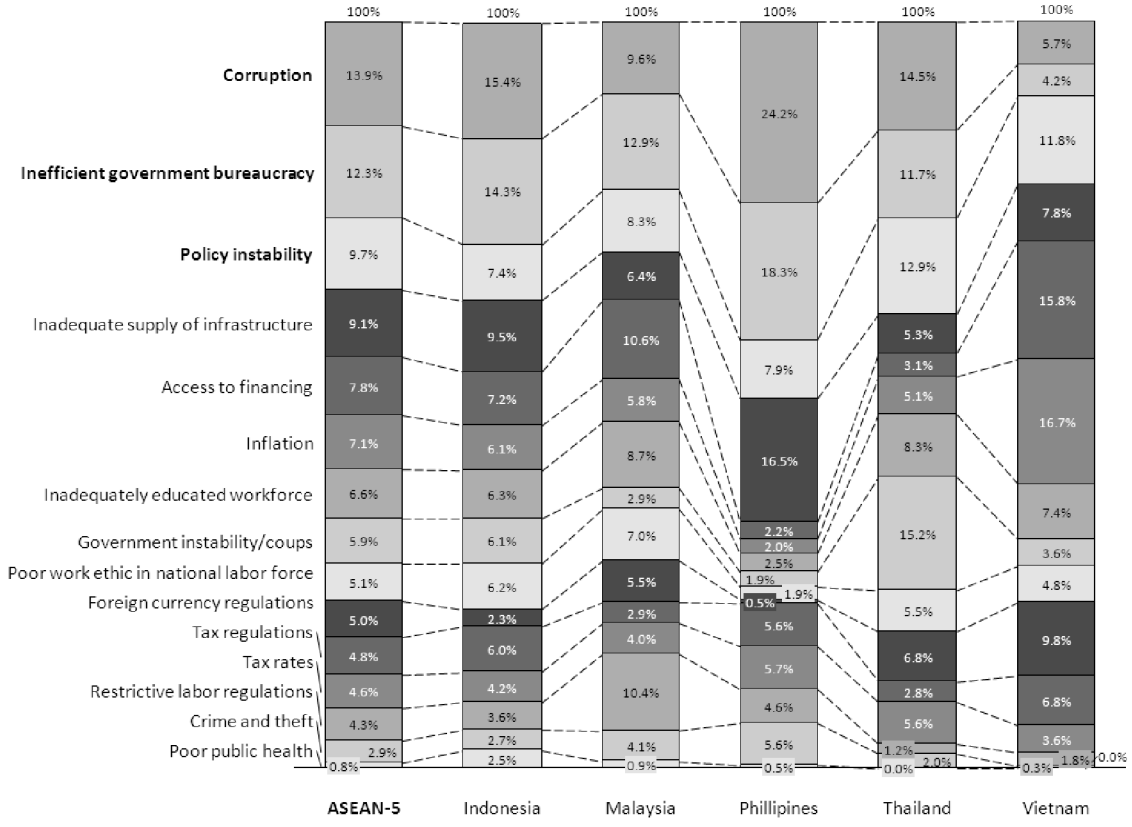

Figure 2.15: Most problematic factors for doing business

Particularities in Indonesia

Home to the world's largest Islamic community, Indonesia is the third largest democracy and the fourth most populous country (246 m inhabitants) on earth; it governs more than 17,000 islands with its main population (80%) concentrated on Java and Sumatra. Successful parliamentary and presidential elections in 2009 provide evidence of increasing political stability, which might become a comparative advantage over neighbors competing for the attention of international companies. Since 1945 Indonesia has been a Presidential Republic, with 33 provinces across the archipelago following the Civil Law system inherited from the Dutch. Today, increasing legislation regarding the domestic use of resources confirms the government's commitment to move beyond its commodity-based economy.[17]

Adversely, the "soft" infrastructure of the non-market environment is strongly hampered by consistent high levels of corruption (international managers and expatriates in the region speak

about the "rule of lords" instead of the "rule of law"). The weak legal system makes it difficult to enforce claims and literally impossible to defend intellectual property. In terms of environmental and social performance, there is also much room for improvement. Therefore, in order to improve the business climate, Indonesia must take committed action to crack down on corruption and increase the availability of an educated, skilled workforce in order to advance technological, ecological and social gains.

2.2.2 The regulatory environment

Nations attract private investment in infrastructure through providing a stable regulatory environment, created by laws and policies that foster long-term and market-oriented reforms. In his paper about the institutional transition of the Indonesian electricity sector, Purra (2009), from the University of Singapore, concludes that "despite the government's proactive policy measures to overhaul the sector governance, a real reform is held back by the relative weakness of the sector's governing institutions". For decades, the Ministry of Energy and Mineral Resources (MEMR) have played the main regulatory role, yet its departments are not only responsible for policy formulation but also for the execution of regulatory functions. Due to the prevalence of PLN, the Ministry of State-Owned Enterprises (MSOE) also has a say in power market related issues, while the Ministry of Finance (MOF) assigns subsidies and grants loans to the state-owned incumbent. Moreover, the National Development Board (BAPPENAS) assumes the function of power market development and planning, while the Ministry of Economy (MOE) is the direct link between the president and the entire energy sector organization.

In fact, the regulatory environment, as graphically presented in Figure 2.16, has contributed to the sector's inability to reduce the country's widespread electricity shortages and generally low electrification rate. This failure is largely attributable to protectionist, dysfunctional, and multi-layered regulatory authorities acting without efficient coordination, clear roles and responsibilities, milestones, accountability, and transparency. Since the 1990s, only 10,000 MW of electricity supply have been added to the grid. This high degree of political influence is inherited from decades of a centrally planned economy; therefore, IPPs will have to endure and adapt to the situational truth of a weak regulatory environment dominated by a central player – PLN. The institutional void left by understaffed and undercapitalized authorities that should

implement, enforce, and oversee energy sector policies, will also remain a risk factor with impacts that are difficult to predict.

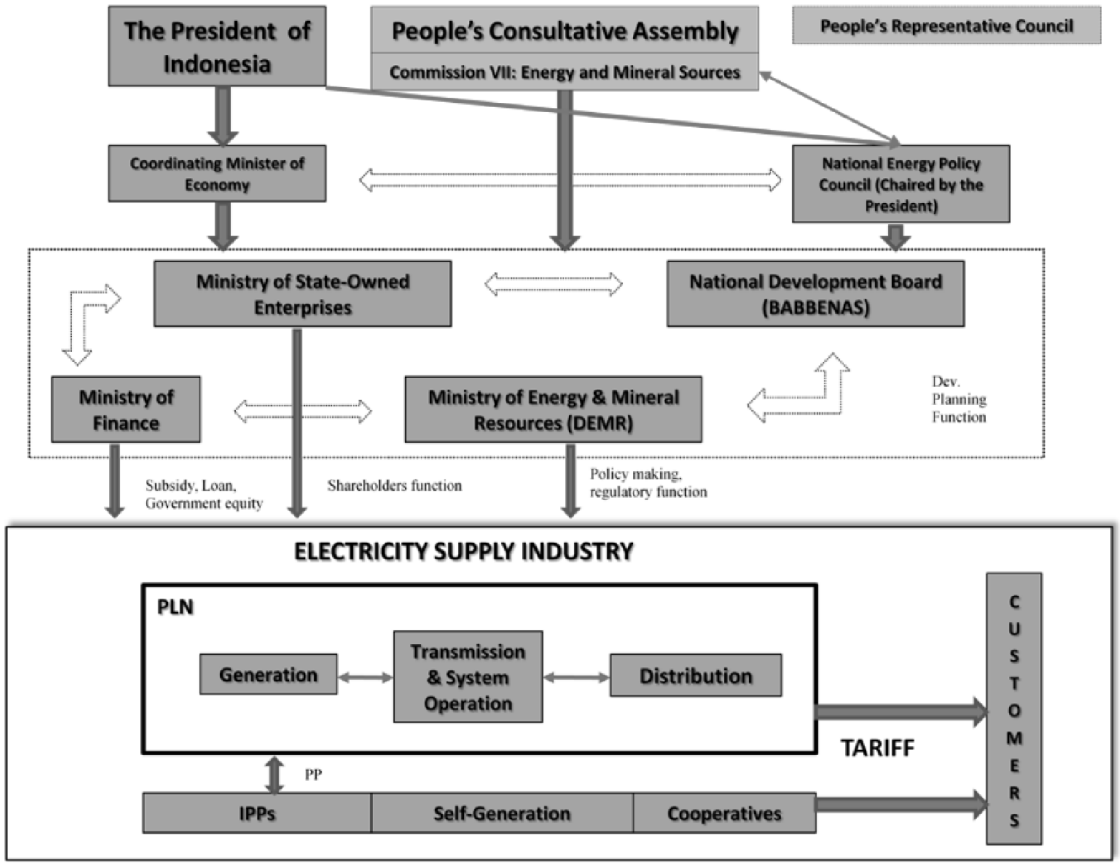

Figure 2.16: The institutional governance structure of the Indonesian energy sector[18]

As a first step toward improving coordination between regulatory authorities, the GOI introduced the National Energy Council (NEC or BAKOREN), chaired by the President himself and staffed with eight non-governmental energy experts supported by the MEMR. Its main responsibilities[19]:

- Formulation of a national energy policy to be implemented by the government after approval by the parliament;
- Development of a national energy development plan;
- Providing solutions in case of an energy crisis; and
- Supervision of the implementation of cross-departmental energy policy.

Additionally, the IEA (2008) expects Indonesia to especially focus on the improvement of environmental and social parameters along with creating a more coherent regulatory environment – something that was neglected in former times when engineering disciplines prevailed. A trend towards the utilization of renewable energy can also be identified by studying policies for energy sector from 2000 to 2010 (see Table 7.11 in the Appendix).

The Electricity Law No. 30/2009

In September 2009, the controversially interpreted and discussed Electricity Law No. 30/2009 was passed, with the aim of terminating PLN's monopoly in distribution and retail by allowing private investors to participate in mid- and downstream activities (as shown above in Figure 2.9). However, no unbundling of the state-owned utility is planned and liberalization will take a few years to affect the current market organization; effectively, electricity tariffs remain regulated and all players must comply. The regulatory framework for IPPs, by contrast, foresees a very clear process. In principle, IPPs take the full responsibility for the fuel supply, construction, and operation of the power production facility, whereas PLN's role is limited to off-take the power and pay a "cost-plus-fee" tariff to the IPP. Further important key provisions are summarized in the table below.

Table 2.3. Key provisions regarding market participants under the 2009 Electricity Law[20]

Actors	Conditions and responsibilities
PLN	**Market conditions** - "First right of refusal": PLN has the first right in for electricity supply in Indonesia - Not unbundled - Monopolist in the existing transmission and distribution grid, Systems operator - No longer monopolist in generation: Corporate bodies, cooperatives and self-supporting communities are for the first time allowed to participate in the supply of electrical power to end-users **Responsibilities** - "Obligation to serve": Appointed by law to serve areas where no private interest has been shown - Obliged to purchase electricity generated from smaller than 10 MW renewable power plants
Regional Authorities	**Market conditions** - Private companies may sell electricity directly to the regional government through PPAs, or cooperate with local government for small-scale projects **Responsibilities** - Increased autonomy regarding electricity supply - May provide licenses for projects that do not involve PLN or grid-connected IPPs

IPP	**Market conditions** - Areas not already served by PLN may be served by private businesses as long as the specific area is not included in PLN's plans for electrification - IPPs generating electricity in areas already served by PLN may only sell electricity to PLN (PPA) - Captive generation: May be conducted by government agencies, regional government, state-owned companies, regional-owned companies, private corporate bodies, cooperatives and individuals. Needs to hold a government issued permit **Responsibilities** - Private business need a license to provide electricity for public use - an IUPTL - granted by the central government to sell electricity directly to end-users - Need to build transmission and distribution grid if supplying directly to end-users

Other relevant regulations[21]

In addition to the Electricity Law of 2009, several new laws and policies concerning the use of renewable energy, infrastructure investment, environmental and social issues, as well as property ownership have been promoted over the last decade. IPPs in particular are affected by the following set of regulations which are worthy of review in the individual context of each project, as certain regional differences might exist (especially regarding environmental impact statements and land acquisition processes):

- **Investment Law No. 25/2007** (key investor guarantees, foreign currency repatriation, exemption from import duties and VAT for capital goods; provisions for IPPs include prioritization of Indonesian manpower/local components, securing a safe and healthy work environment, implementation of a CSR program, fulfilling environmental obligations, and regulating foreign ownership);
- **Environment Law No. 32/2009** (IPPs are required to file an Environmental Impact Planning Document "AMDAL", particular environmental obligations for companies using natural resources are formulated in the 2007 Company Law);
- **Forestry Law No. 41/1999** (excludes specific activities in protected forest areas unless a Forestry Lend Use Permit "IPKH" is granted, e.g. for power plant projects of strategic importance; obligations include land compensation transfers and payments to local land owners);
- **Land Acquisition Law No. 36/2005** (regulates, among other property-related issues, the application for land expropriation and the negotiation of compensation including an independent land acquisition committee, a land appraiser, and GOI representatives).

2.2.3 Market actors

The following review of stakeholders in the Indonesian energy sector provides a starting point for business developers and strategists from which to further investigate formal and informal networks to explore the analyses, hypotheses and conclusions of this non-market-related section in practice.

The Government of Indonesia

In 1945, Indonesia gained its independence from the Netherlands with the consequence of an economic collapse. Under the authoritarian rule of General Suharto (1967-1998) – the "New Order" administration – the country evolved into a centralized and military dominated nation. Since 1998 however, democracy has spread including direct presidential elections; Indonesia is a democratic republic where the President acts as head of state but also has executive powers. The directly elected People's Consultative Assembly is formed by the 550-member House of People's Representatives and the 128-member Regional Representatives' Council. The government focuses on growth creation, investment, and employment while facing challenges in the areas of corruption and subsidies for fuel and electricity. Policies are characterized by distinctive protectionism in the mining industry and raw material exports.[22] In addition to the previously introduced MOE, MOF and MSOE, the GOI acts on the energy market through the MEMR, which is responsible for steering and governing the energy sector with policies, implementing them accordingly, and regulating energy-related issues.

The GOI through the MEMR (including Directorate General of Electricity and Energy Utilization and Directorate General of Renewable Energy and Energy Conservation) is also responsible for different sets of electricity market development plans. First, the MEMR itself develops the Electricity Master Plan (RUKN), which includes a ten-year demand and supply forecast, an overview of the regulatory landscape, and guidance on the utilization of renewable energy. In addition, PLN takes care of the annually reviewed Electrification Development Program (RUPTL) containing, among others, future expansion plans to meet rising demand, fuel requirements, and a list of projects under development both by PLN and IPPs. Further relevant authorities at the government level include the National Development Board (BAPPENAS), which manages Public Private Partnership (PPP) transactions, the Investment Coordinating Board (BKPM), which handles the licensing for electricity projects, the Policy

Committee for the Acceleration of Infrastructure Provision (KKPPI), which coordinates overarching infrastructure development policies, the MOF, which approves tax exemptions and transfers subsidies to PLN, the MSOE, which supervises PLN, and the NEC, which supports the GOI in formulating energy policies.[23]

PT. Perusahaan Listrik Negara

Established in 1964, the vertically integrated PLN suffers from serious financial and human capital deficiencies to responsibly plan, design, build, operate, and maintain its power stations and transmission network. Specifically, the incumbent lacks skills and knowledge in the field of state-of-the-art power generation technology, in both conventional and renewable energies. In the aftermath of the Asian crisis in 1998, PLN suffered enormous losses from USD-denominated PPAs with IPPs due to the strong depreciation of the Indonesian Rupiah (IDR) against the Dollar.[24] In 2011, the public company's revenues amounted to 22 bn USD, 45% (!) of which were direct subsidies from the state, while EBIT was calculated at 1.5 bn USD.[25] In other words, electricity prices would have to nearly double in order to sustain a profitable state-owned utility at the current commodities price level without support from the GOI. Clearly, more efficient portfolio management and best practice exchange on a global level are more than needed to streamline the business and address future demands.

Above all, PLN is the central decision-making body for IPPs:

- Responsible for tendering IPP projects;
- Sole off-taker and thus counterparty for PPAs;
- System operator who decides on plant dispatch;
- Enables project inclusion in the RUPTL and connection to the grid;
- Largest player in the market competing with IPPs for best projects and resources.

In considering the information gathered in this paper on the regulatory environment in Indonesia and the comfortable position of PLN, one might complain about shortcomings, but a business strategist with foresight would ask whether such a seemingly dire situation could be turned into an opportunity. In the words of Purra (2009), "all roads lead to PLN". But although the incumbent is a powerful off-taker able to dictate the rules of doing business on the one hand, on

the other hand, forging a partnership with this single and influential player could make for a bright and promising future.

Local governments and informal networks[26]

Local governments with opaque processes command more and more authority in decision-making processes and are indeed the gatekeepers for IPPs. Following the trend of decentralization, they wield increasing powers in terms of proposing power plant projects and tender them in coordination with PLN. The institutionalization of local governments however is extremely poor due to weak financing from the state; thus they are susceptible to financial support from wealthy party members or outsiders, which include bribes and corruption. In this manner, family clans, business elites and wealthy individuals pave the way for their favored solution, engaging in so-called "money-politics". But there is also positive news for power plant developers: Predetermined tender following unsolicited proposals mostly favor the project initiator according to the "first come, first serve" principle.

As we have seen, familial ties are important throughout all business sectors in Indonesia. Clans such as the Bakri, the Widjaja, the Suharto (of the former president), the Djojohadikusomo, or the Panigoro act as informal networks that are influential in both politics and business. Politically, two main philosophies, the technocrats represented by the Democratic Party and the Nationalists, following the old interest of the "New Order" regime under Suharto and represented by the Golkar party, compete for power in the Indonesia. In the energy business, the Bakri clan (one member also chairs Golkar) is the most influential family. Companies like Bakri & Brothers (an Indonesian conglomerate) and Bumi (Indonesia's largest coal miner) maintain strong ties to both PLN and the GOI. In terms of academic networks, alumni of the Institut of Teknologi Bandung (ITB) sit on the management boards of almost every energy company and the Minister of Energy and Mineral Resources as well as PLN's CEO are also graduates. Official and easily accessible business networks for new IPP players can be the Indonesian Electric Power Society and the Independent Power Producers Association.

Competitors

With the exception of GDF Suez (via International Power), European companies have not yet started to invest into the Indonesian power market. International IPPs are mainly of Japanese,

Chinese and Malaysian origin. For example, Mitsui, a Japanese conglomerate, and the Tokyo Electric Power Corporation (TEPCO) benefit from substantial financial support from the Japan Bank for International Cooperation (JBIC), which provides low-interest loans to Japanese firms and negotiates direct guarantees for power plant projects with the GOI. The following list provides an overview of the main national and international competitors including recent information about the status of their market share as well as planned and ongoing projects.

Table 2.4: Utilities, industrials, and mining firms competing for the Indonesian IPP market

	Origin	Core business	Planned capacity (MW, pro rata)					Under construction (MW, pro rata)					Operational (MW, pro rata)					Market share
			Total	Coal	CCGT	Hydro	Geoth.	Total	Coal	CCGT	Hydro	Geoth.	Total	Coal	CCGT	Hydro	Geoth.	
Total			**13,153**	**11,084**	**1,489**	**313**	**267**	**2,964**	**2,446**	**20**	**375**	**123**	**6,154**	**4,223**	**864**	**1,067**	**0**	
IPP			**8,714**	**7,403**	**864**	**180**	**267**	**2,751**	**2,356**	**20**	**375**	**0**	**5,107**	**4,091**	**730**	**286**	**0**	**100%**
Captive power			**4,439**	**3,681**	**625**	**133**	**0**	**213**	**90**	**0**	**0**	**123**	**1,047**	**132**	**134**	**781**	**0**	
International players			**4,618**	**3,631**	**750**	**0**	**237**	**2,356**	**2,356**	**0**	**0**	**0**	**3,757**	**3,481**	**150**	**126**	**0**	**74%**
China Huadian	CHN	Utility	1,102	1,102									126			126		2%
Edison Mission	USA	Utility																
Int. Power GDF Suez	GBR/FRA	Utility	77				77	253	253				423	423				8%
Itochu	JPN	Conglomerate	723	640			83											
J-Power	JPN	Utility	700	700														
KEPCO	KOR	Utility	820	70	750			178	178									
Korea Midland Power	KOR	Utility																
Marubeni	JPN	Conglomerate	77				77						394	394				8%
Mitsui	JPN	Conglomerate						405	405				612	612				12%
SSP	CHN	Conglomerate	1,000	1,000				200	200				450	300	150			9%
Sumitomo	JPN	Conglomerate						1,320	1,320				1,320	1,320				26%
TEPCO	JPN	Utility	119	119									188	188				4%
YTL	MYS	Conglomerate											244	244				5%
National players			**3,706**	**3,382**	**114**	**180**	**30**	**375**	**0**	**0**	**375**	**0**	**740**	**0**	**580**	**160**	**0**	**14%**
Bakri	IDN	Conglomerate	772	742			30											
Bukaka	IDN	Conglomerate	180			180		375			375		160			160		3%
Cikarang Listrindo	IDN	Utility	114		114								580		580			11%
DH	IDN	Conglomerate	2,640	2,640														
South Sumatra IPP	IDN	Utility																
Triaryani	IDN	Utility																
West Java Power Project	IDN	Utility																
EPC turnkey contractors			**390**	**390**	**0**	**0**	**0**	**20**	**0**	**20**	**0**	**0**	**610**	**610**	**0**	**0**	**0**	**12%**
Siemens	GER	Conglomerate											610	610				12%
Truba	IDN	Conglomerate	390	390				20		20								
Local industrials (captive power)			**1,850**	**1,250**	**600**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**781**	**0**	**0**	**781**	**0**	
Asahan Aluminium	IDN	Metals											426			426		
Asia Pulp and Paper	IDN	Pulp & Paper																
Astra International	IDN	Mining																
ERAMET	IDN	Mining																
Inalum	IDN	Metals																
Int. Nickel Indonesia	IDN	Metals											355			355		
Nalco	IDN	Metals	1,250	1,250														
Solway	IDN	Mining	600		600													
Local coal and gas suppliers (partly captive power)			**2,589**	**2,431**	**25**	**133**	**0**	**213**	**90**	**0**	**0**	**123**	**266**	**132**	**134**	**0**	**0**	
Adaro	IDN	Mining	680	680				60	60									
Bukit Asam	IDN	Mining	156	156				30	30									
Bumi	IDN	Mining	1,595	1,595														
Indika	IDN	Mining											132	132				
MEC Coal	IDN	Mining																
Medco	IDN	Oil & Gas	25		25			123				123	134		134			
PGN	IDN	Gas																
Titan	IDN	Mining	133			133												

Note: Captive power plants under the assumption that all local industrials, coal and gas suppliers will use their plant themselves; excluding diesel generators

Data sources: E.ON Research, Platts, company websites, PLN

Overall, the market is quite fragmented and competitors are of similar size (except Sumitomo). Currently there are truly balanced portfolios in terms of technology mix seen in the market. It is clear that non-utility players want to enter the arena as well, however their success rate is likely to be low given their lack of expertise and medium to high entry barriers into the IPP market, attributable to prior power plant development, implementation, and operation experience. Interestingly, mining companies and gas suppliers aim to integrate forward and partner with utilities to implement both captive and IPP power plants. In summary, this list of competitors could therefore also be seen as a pool of potential partners – an important notion for chapter 4.

Non-government organizations

Another large interest group challenging IPPs are non-government organizations (NGOs). They perhaps will oppose projects developed by EEFs mainly due to their brand exposure in the Western world, if not solely for that purpose. Therefore, environmental and social factors must be considered when establishing the business case prior to making investment decisions. One possible mitigation strategy is to transparently share information from the outset (proactively without being asked to do so), and constantly report on sustainability performance in addition to the financial and technical features of the power plant project. Learning from prior projects can be a second source for preparing for conflicts with NGOs. As described under the risk management section later in the paper, thermal units especially (because of carbon dioxide emissions) and hydropower plants (because of their social impacts around storage areas) create both local and international opposition. Applying internationally recognized frameworks like the World Bank Safeguard Policies or IFC Performance Standards and EHS Guidelines, to name only a few, can be a proactive step towards good corporate citizenship that is honored by NGOs and local authorities. For hydropower plants in particular, the IHA Hydropower Sustainability Assessment Tool offers a comprehensive way to assess the sustainability performance of a project against some 20 categories. In short, dealing with NGOs will be a vital part of the non-market strategy.

3 Identifying Sources of Value Creation

Following the description of market and non-market factors pertaining to the IPP business in Indonesia, this chapter identifies and describes three important building blocks for developing a business strategy and deriving the relevant input parameters for a business case. The first part of this chapter strives to identify drivers for value creation and competitive advantage. The second gives an overview of power market needs in Indonesia and reflects the energy sector's shortcomings and deficient capabilities. The third section then focuses on profiles of EEFs and how best for them to overcome hurdles and close managerial and technical gaps by deploying their broad knowledge resource base to develop profitable power plant projects in Indonesia.

3.1 Value drivers in the IPP market

A major source of value creation lies in the market and project levers that enable superior financial performance. Value drivers at market are of a more qualitative nature, whereas value drivers on the project level are clearly quantifiable.

3.1.1 Market level

On a market level there are four main drivers in a prosperous IPP environment that need to be assessed: the general demand for electricity, the performance of the incumbent(s) in meeting this demand, the regulatory environment for doing business in the power sector, and the domestic availability of feedstock.

Electricity demand

As we have seen at the beginning of the power market analysis, the hunger for electricity in SEA in general and Indonesia in particular is ravenous. Low electrification rates combined with pressing GDP growth demand more electricity. Current levels of Indonesian power capacity are already unable to meet the peak demand (including an appropriate reserve level for unplanned unavailability in the order of 20-25% to prevent blackouts) of connected customers.

Performance of state-owned utilities

Given the absence of market pressure, state-owned incumbents tend to delay required reforms, operational excellence initiatives, and performance improvements programs. When firms rely on subsidies and political will, as PLN does in Indonesia, little incentive is given for proper maintenance and renewal of the state-owned plant fleet. Unable to meet the domestic demand and at the mercy of state subsidies (which are likely to be reduced in the future), PLN faces a twofold challenge. Financial resources will become even scarcer in the future while investments for upgrading and extending its portfolio are paramount. Clearly, the poor performance of the state-owned incumbents is a value driver for IPPs in emerging markets – especially if technical capability and experience have diminished on state level.

Regulatory environment

The regulatory environment is a third aspect to consider when investing in specific markets. In Indonesia, the Electricity Law No. 30/2009 and the anticipated "Value Add Law" will shape the non-market conditions. The former aims to break PLN's monopoly and open the market to more competition, secured by the GOI's state guarantees. The latter shall incentivize the domestic commodity sector to expand their value chains and process raw materials locally instead of shipping coal and gas abroad. Both will lead to more demand for IPP capacity in future.

Local resources

The domestic availability of fuel for power plants is important for optimizing OPEX. Thus it is imperative to consider local natural resource conditions and identify efficient transport routes for coal and gas. Although not regarded as "fuel" per se, hydrology-related resources in terms of favorable climatic, topographical, and geological conditions also count as natural resources because hydropower plants rely on the predictable inflow of water to produce energy. Both fossil fuels and attractive natural conditions for hydropower are amply available in Indonesia.

3.1.2 Project level

In order to optimize investments, project level value drivers need to be identified. For power plants, these typically comprise revenue (dispatching of energy), capital (CAPEX) and

operational expenditures (OPEX) including attractive sources for financing as well as cost reduction considerations, and a proactive risk management plan that reduces transaction and sunk costs as well as financial charges, liabilities or damages. Ranges for potential internal rate of return (IRR) improvements due to successful optimization of value drivers are based on the opinions of experts who are active in commercial project optimization in SEA.

Revenues

Revenues are usually considered to be a major value driver in the IPP business. For thermal power plants they are simply calculated as the product of produced energy (that is, installed capacity times hours of full load operations = e.g. 400 MW x 7,000 h = 2,800,000 MWh). The tariff itself has two components: the capacity payment (covering fixed cost components) and the energy fee (covering variable cost components including the feedstock). Assuming the PPA tariff is 45 USD/MWh (30 USD/MWh capacity payment + 15 USD/MWh energy fee), the annual revenues will be 126 mUSD, provided the guaranteed annual availability (here: 7,000 h / 8,760 h pa. = 80%) can be met by the IPP. It must be noted however that the second price component is variable on account of changing fuel costs, which are usually passed through to PLN (please see Figure 4.5 in section 4.3.3 at the end of the paper for a detailed graphic explaining the mechanism). In hydropower, the tariff covers CAPEX, OPEX, and the IPP's margin only. There is also a financial upside linked to higher availability of hydropower plants since PLN might enter into an obligation to evacuate all of the power produced from this renewable energy source at the agreed tariff. Hence, the only value driver that influences the revenue side for both thermal and hydropower technologies is the annual availability of the plant.

When selling to captive off-takers, potential surplus energy must be evacuated to the grid and (ideally) will be remunerated by PLN or other industrials at reasonable prices. Therefore, proper dispatching could also be a source for revenue optimization, especially when serving more than one customer or a commercial conglomerate. Increasing efficiency to have capacity available for dispatch above the contracted value by 50 base points (bps) (say 80% contracted capacity vs. 85% actual availability) translates into an increase in IRR of about 80 to 100 bps, depending on the technology (coal and gas, respectively).

CAPEX

By far the largest cost component of a power plant is the required upfront investment. Power generation is a capital-intensive business, which makes it worthwhile to investigate leverage options, recourse or project financing to drive down capital costs. In this context, two major financial facilities are available in Indonesia: the aforementioned IIGF covers political risks (e.g. amendments in regulations), project performance (e.g. delays in land acquisition) and the off-taker (payment default), whereas the Infrastructure Financing Fund supports investors in obtaining local finance for infrastructure projects. Without government support, achieving competitive financing terms could prove difficult. Figure 3.1 explains the contractual and payment mechanisms of the IIGF applying a recourse-financing scheme.

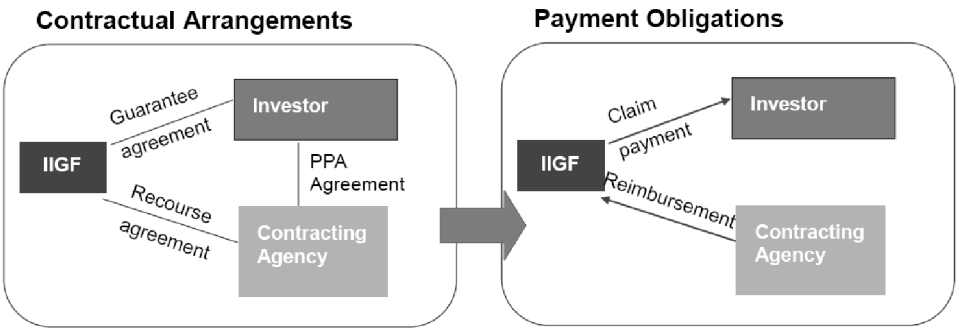

Figure 3.1: Principles of the recourse financing scheme under the IIGF[27]

Reducing the CAPEX requirement through value-engineered design or cheaper equipment is a second lever for optimizing the profitability of a power plant. Sensitivity analyses in financial models show that a CAPEX decrease of 5% lead to approximately 50 to 70 bps in IRR for a coal or gas-fired power station and circa 90 bps for a hydropower plant.

OPEX

Optimization of operations can be achieved through external portfolio benchmarking and best-practice initiatives; European companies can draw upon their vast portfolio management experience and continuous improvement of operation and maintenance (O&M) activity to this end. In addition, purchasing power through an established network of reliable suppliers can drive down O&M costs while increasing the overall availability of the plant. In particular, a well

thought-out preventive or condition-based maintenance strategy can add value by using international know-how in its development and training locals in its execution. Likewise, the in- and outsourcing of O&M activities must be considered as another value driver, dependent to a large extent on the scale of local operations and presence in the Indonesian power market. Reductions in OPEX by 5% equal an additional IRR upside potential of nearly 10, 20, and 60 bps for hydro, coal, and CCGT plants, respectively.

Risk management

Proactive risk management not only lies at the heart of project management, it is also a well-established concept that maneuvers corporations through difficult market situations. These IPPs that can identify, assess, manage, control, and mitigate risks the best will create significant competitive advantage for themselves, which will result in credible and repeatable actions both at the government level, in negotiations with PLN, and in local stakeholder meetings. An overview of the most relevant risks IPPs face (and corresponding mitigation strategies) is provided in chapter 5.

3.2 Local market needs in Indonesia

Following these insights on which components to focus on in creating value for an IPP project, we will now concentrate on specific local market needs in Indonesia which must be addressed in the value propositions of a successful IPP business model.

3.2.1 Overcoming institutional voids

Local market needs are best demonstrated by investigating institutional voids. In order to show the effects of the lengthy procedure involved in becoming an IPP and to demonstrate the institutional hurdles that hamper investment, the renewable energy sector will be examined. Though renewable energies (RE) are slightly outside the scope of this thesis (except for hydro, which is also included in this case study) and might be considered as either a stand-alone or side option for EEFs doing business in Indonesia, this foray into the renewables arena will compare the potential of different renewable technologies in Indonesia and identify institutional voids in the process of developing them, from the perspective of a foreigner attempting to become a so-

called Small Power Producer (SPP). The conclusions drawn might also be relevant for the "large-scale" IPP business and will particularly focus on sunk costs of project development resulting from institutional barriers.

According to Lidula (2006), SEA is blessed with copious renewable energy sources. Especially, Indonesia, Malaysia, Philippines, Thailand and Vietnam offer significant technical potentials that are underdeveloped because of a lack of institutional capabilities as well as policy barriers. Of this enormous potential, only a small portion has been developed to date (see the following chart). Geothermal resources in Indonesia alone account for approx. 40% of the world potential.[28] Obviously, Indonesia's REs have a strong upside proposition.

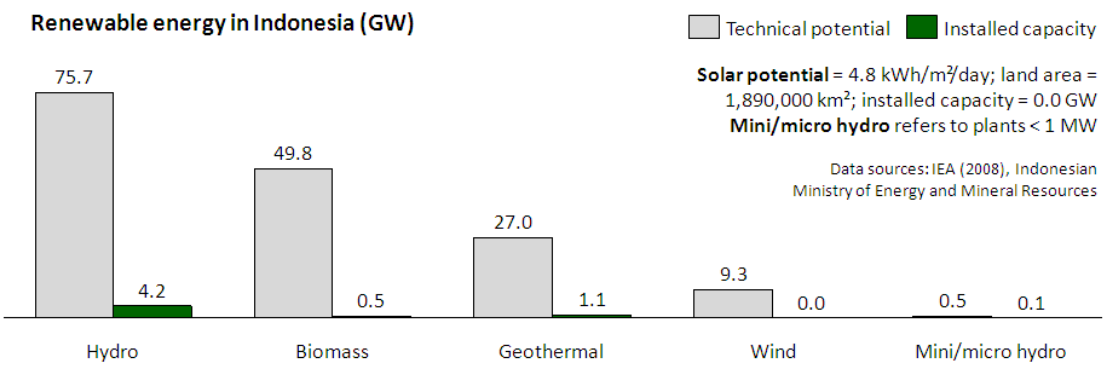

Figure 3.2: Renewable energy in Indonesia

Significant development barriers that need to be addressed are: (1) Lack of an incentivizing framework to make the costs of developing RE more competitive, (2) only limited experience with competitive tender procedures on government level, and, above all, (3) time-consuming permitting processes such as the receipt of environmental impact statements (up to two years), land permits from local governors, and the go-ahead from provincial heads. Filling (parts of) these institutional voids with experience from European RE developments would create a significant competitive advantage, e.g. through leveraging know-how and awareness in technology and management, introducing European funding for RE developments, utilizing existing relationships with state-owned utilities to gradually add RE to a thermal IPP portfolio, and consulting with the government in respect to RE policy formulation.

From an investment perspective, decentralized stand-alone projects bear the risk of high upfront development costs compared to the actual CAPEX. In Indonesia, the transaction costs related to satisfying all of the regulatory requirements and gaining the permits necessary to start a RE facility need to be considered. Although these costs exist in every country, they are significantly higher in emerging markets because of the time it takes to get regulatory approval and the illegal payments expected to speed up the process. According to Kjetil Roine, Investment Analyst at Differ Group (a Norwegian consultancy in the field of carbon reduction), small hydropower projects of up to 10 MW may take 5 years to develop due to regulatory hurdles in obtaining 40 plus individual licenses. In one project for example, approval for foreign financing required the signature of six different ministers. Roine also shares insights on bribery: "Indonesia's regulatory maze and unclear ownership system provided plenty of room for deliberate delays and increased pressure for illegal payments. Despite not giving in for this pressure, the project had experienced cost overruns by more than 20% when it was finally put into operation, 1.5 years delayed."[29] One solution to overcoming these difficulties and to at least reduce the inevitable transaction costs is to develop several projects concurrently, ideally under similar regulatory jurisdictions. Corruption must be challenged through engaging with local representatives, with the goal of successfully influencing the processing time without illegal contributions. Contributing to these opaque factors that cripple the approval system must not be part of a sound business strategy.

In summary, while RE may be an attractive investment in Indonesia in the future, regulatory improvements, a reduction in the number of procedures and tariff incentives must be put into place in order to outweigh the transactional efforts of developing such small-scale projects to make business sense. As we have seen, compliance will be an issue, regardless of the project size. In this regard and concerning the ambiguous procedures of local authorities in the project area, IPPs can learn from the experience of smaller companies that have already gained valuable market experience. Luckily, institutional voids are more or less the same for all market players – and therefore beneficial to those who can deal with them most efficiently. Once SPPs or IPPs succeed, the regulatory barrier then protects them from new rivals, provided they can learn from their interaction with authorities, shorten the lead time of their developments, and scale-up their portfolios by successfully developing several projects at the same time.

3.2.2 Managing large-scale power projects

Following the analysis of institutional voids the next paragraphs focus on local market capabilities for managing large-scale power projects. For this purpose the current status of power project developments in Indonesia are discussed.

Coal-fired power plants

The market environment for coal-fired power plants is highly dominated by Japanese and Chinese developers, but lacks certain capabilities in the operational phase as well as in the commercial optimization of existing plants. The development phase of many projects between 250 and 600 MW is usually awarded to Indonesian players with little experience in the power sector. Small-scale plants (<150 MW) are especially needed for powering mines. In terms of the execution phase, Chinese contractors have quite a bad reputation in respect to quality and performance in the mid-size category, largely due to the failed "Fast Track 1" program of the GOI (aiming at adding 10,000 MW), while currently Japanese firms consistently manage to succeed in large scale developments above 600 MW. Overall, the weakest part of the project life cycle of coal plants in Indonesia is the operational phase; PLN has an especially poor track record in this regard due to outdated and low equipment standards and a lack of experience. Commercial optimization could be mainly driven by performance improvements since the cost for local coal sourcing has no impact on the PPA tariff (pass-through to PLN).

CCGT power plants

Unlike coal plants, gas-fired power stations are currently only developed in small sizes. CCGT as a technology is not widespread, which offers a huge market potential for future capacity additions. Current assets are operated by PLN and a few industrials. Most of the flexible gas-fired power plants in Indonesia run on oil due to the lack of an adequate fuel supply. LNG and gas pipeline infrastructure needs to be developed to enable further utilization potentials. Additionally, there is no relevant market experience in OCGT-CCGT conversion. Clearly, the gas-fired power sector is the most underdeveloped of the available technologies.

Hydropower plants

The market needs specific capabilities to increase the quality of feasibility studies in the hydro sector. Very few IPPs own a significant portfolio of hydropower assets in the market, which is dominated by PLN. Despite the huge potential (mainly run-of-river power plants and a few storage plants), there is little market experience with successfully developing hydro projects in a reasonable time frame of 3 to 5 years. On the operational side, PLN lacks a systematic and coherent O&M strategy, leaving capacity idle and creating environmental concerns.

Project identification and development

Identifying projects and carefully screening of market opportunities is a key task in successful project development. During this phase, the ability to distinguish worthwhile from worthless investments is of central importance in order to avoid sinking development expenditures into economically doubtful projects. In this context, combining relationship management skills with a wide and experienced supplier base both in and outside the target countries is useful to highlight the value proposition of EEFs to potential local partners. Evidence of poor project management can be found in the delayed capacity additions throughout the past few decades in Indonesia. EEFs may find it difficult to compete on cost in local markets, but the market (and PLN) highly values strong project development skills supported by a broad international engineering base of expertise.

Building power plants

Other success factors in the power industry are construction and O&M skills, because both optimize the main value drivers of generating electricity. Engineering know-how traditionally translates into optimized CAPEX and OPEX, which are needed in SEA. Despite technological development, state-of-the-art technologies are not fully deployed in Indonesia; outdated plant designs were often made decades ago, which leads to difficulties during construction. Project's sustainable development aspects are also more than relevant because of the increasing activity of NGOs as well as brand reputation issues. Coming from a heavy regulated business environment with frequent changes in energy policy, EEFs are highly experienced in dealing with the critical environmental and social aspects of projects. During construction, most of these topics materialize only after the investment decision has been made. Active construction

management and environmental monitoring can become key characteristics of reliable IPPs in the market, and as a result, trust is earned both on government and local levels. Too many IPP project developers have promised too much and delivered too little; such examples eventually led to the suspicious opposition of many projects. In short, strong power plant implementation capacities are needed in the Indonesian market, which can be delivered by EEFs.

Operations and commercial optimization

The concept of an active strategy for power plant fleet management is not common in Indonesia. In the absence of a power market where capacity and energy can be optimized to benefit from portfolio effects (for example through provision of reserve energy), PLN operates its assets on a full load basis but without proper maintenance cycles, resulting in low reliability, availability, and efficiency. According to PLN's Financial Statement (2010), approximately 7% or 1.0 bn USD of PLN's annual budget is spent on O&M, but without a systematic approach to plant performance improvement and lifetime extension. Thus, the Indonesian power market needs more than only investments; it requires comprehensive and coherent management and steering as well as technical know-how and experienced engineers to upgrade and extend the current plant portfolio with the objective of meeting future demands. EEFs are well positioned to fill these gaps, as we will see in the next section.

3.3 Capabilities of European utilities

To date there is not one European entity active in the Indonesian power market, with the exception of GDF Suez through its 2012 acquisition of International Power. International Power is the largest IPP player in the world, and builds its success on a highly diversified – both geographically and technologically – portfolio. This section will test the current strength of the largest European players in the power sector and review their relative performance compared to PLN, briefly analyze their current business model, and collect similarities in capabilities based on their portfolio and market experience. These insights will enable the reader to obtain important information on the primary target group of this thesis – EEFs – before proceeding to the proposed business model and strategy formulation section.

3.3.1 Overview of selected European power companies

Due to challenging power market conditions at home, EEFs are eager to develop their business outside Europe by leveraging their existing knowledge base. A heated debate about the future of nuclear power, the rise of renewables in combination with a renaissance of decentralized power generation, uncertainties about the impact of carbon markets, costly investments to replace outdated plants yielding moderate returns, heavy liabilities on the balance sheets, a depressed demand outlook for the mid and long term, a European Union striving for more competition by breaking monopolies, pursuing unbundling initiatives, and increasingly liberalizing energy markets – these are the major problems power companies must deal with in Europe. Looking back at their historic strengths with some irony, the Credit Suisse European Utilities Team (2012) states that, finally "utilities become a 'normal' industrial sector".

A relative comparison of European utilities and PLN

Despite all these changes, EEFs still enjoy a competitive advantage stemming from decades of experience in an industry with perpetually high entry barriers, at least in the centralized large-scale generation business. Table 3.1 lists the eight major power companies in Europe and compares them in respect to several financial metrics and their overall portfolio composition. As a reference, the 2010 figures of PLN are also provided to better understand the relative performance of the Indonesian incumbent and put its generation structure into perspective.

Table 3.1: Profiles of European Utilities – Facts and figures 2010

General information 2010		EDF	Endesa	Enel	E.ON	GDF Suez	Iberdrola	RWE	SSE	PLN
Origin	-	**FRA**	**ESP**	**ITA**	**GER**	**FRA**	**ESP**	**GER**	**GBR**	**IDN**
Founded	Year	1946	1944	1962	2000	2008	1992	1898	1998	1964
Revenues[1]	bn EUR	65.2	31.2	74.4	92.6	84.5	31.6	50.7	24.2	12.0
EBIT	bn EUR	6.2	5.0	11.3	9.5	8.8	4.5	7.7	1.7	1.0
Assets	bn EUR	240.6	62.6	168.0	152.9	184.7	96.9	93.0	20.3	27.3
Employees	k	159	26	78	85	236	33	71	20	46
Customers[2]	m	37	25	61	17	22	30	24	9	42
Generation portfolio 2010[2]										
Total	GW	**133.9**	**27.8**	**97.2**	**68.5**	**78.2**	**45.0**	**52.2**	**11.4**	**26.9**
Nuclear	GW	74.3	3.7	5.3	11.3	6.4	3.3	6.3	0.0	0.0
Coal	GW	25.4	5.8	57.2	19.3	7.1	4.7	26.1	4.4	9.5
Gas, Oil, Others	GW	9.4	10.7		28.8	45.0	14.5	14.6	4.6	13.4
Hydro	GW	21.5	7.5	31.0	5.5	13.4	9.9	2.9	1.5	3.5
Renewables	GW	3.3	0.1	3.7	3.6	6.3	12.6	2.3	0.9	0.5
Performance ratios										
Revenues/10.000 employees	k EUR	410	1,200	954	1,089	358	958	714	1,210	261
Installed capacity/customer	kW	3.6	1.1	1.6	4.0	3.6	1.5	2.2	1.3	0.6

1) PLN figures including subsidies; 2) Electricity and gas customers; 3) GDF Suez figures excluding capacities of International Power (9 GW); RWE figures including power procurement rights.

Source: Annual Reports 2010 obtained from company websites in June 2012

In terms of productivity (revenues per 10,000 employees), the gap between PLN and (partly) state-owned EEFs such as GDF Suez, EDF, RWE, and Enel is significant. It is hardly surprising, however, that the four utilities with the lowest productivity ratios among this group of eight are also state-owned. The installed capacity per customer, although a ratio more of theoretical nature because it disregards the business model and customer structure, suggests that in order to achieve a value similar to the lower range of EEFs figures, the portfolio of PLN would have to at least double. As in many financial analyses, the table presented above only provides a partial view of firms and does not account for structural specifics or national differences between the businesses. However, there is a clear performance and supply gap indicated, which, on the one hand, confirms the substantial improvement potential of PLN compared to its European counterparts, and, on the other hand, implicitly indicates the managerial, financial and technical edge of European utilities over the Indonesian market leader.

Centralized power generation – a fading business model in Europe?

Electricity is a fairly "powerful" end product because it is not substitutable and has the same characteristics everywhere in the world. Power generation however is a long-term investment with several technological options to choose from (see Figure 3.3). Centralized power generation (nuclear, conventional thermal, and large scale hydropower plants) was and to some extent still is the most common method used to power Europe – it runs on a business model based on capital-intensive investments in exchange for long-term regulatory commitments by states. Demand has been constantly increasing and revenues were secured by fixed tariffs paid by "off-takers" rather than "customers". Today, the unbundling of the typically vertically integrated businesses is progressing at full speed and market mechanisms for energy trading are in place. In the short and mid-term future, an environment of increased competition will force utilities to either rethink their business models for Europe or leverage their knowledge beyond the continent's borders. The latter choice offers attractive opportunities for exploiting the know-how of a business model that seems to be fading, at least in Europe: the building of large-scale, centralized power generation facilities and selling the produced electricity to off-takers, thereby deploying the oligopolistic bargaining power (see Figure 3.4).

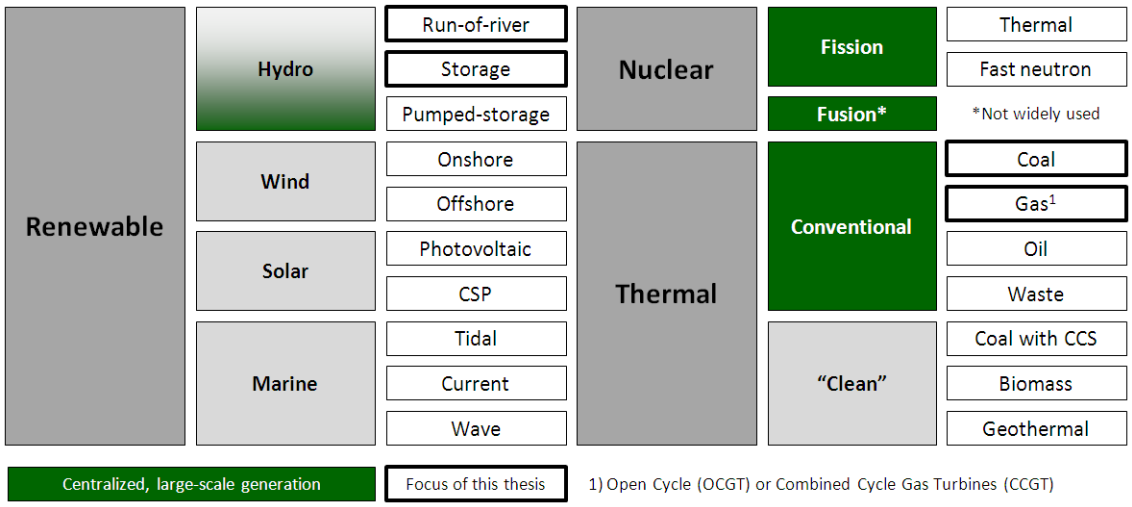

Figure 3.3: Power generation technologies

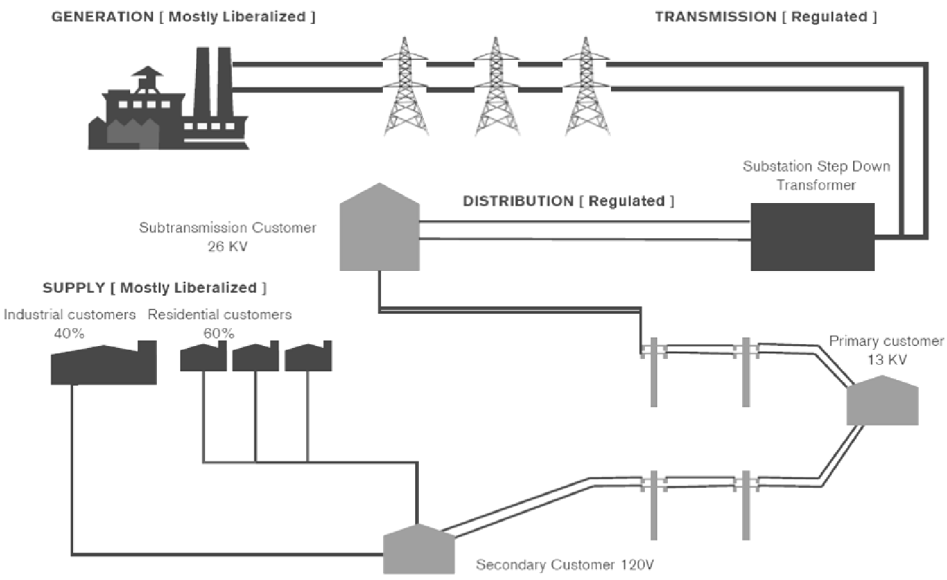

Figure 3.4: Basics of the centralized power generation in Europe[30]

3.3.2 Managerial and technical experience

In order to successfully enter the SEA IPP market, newcomers need to fulfill the local requirements for IPPs. These include credible financing capacity, capabilities to develop and construct large scale capital projects, expertise in running cost-efficient power generation facilities (particularly coal), and familiarity with the challenges of rapidly developing markets.[31]

Experienced EEFs command distinct capabilities. First, typical strengths are the development, implementation, and operation of single plants utilizing both bargaining power over suppliers and know-how in execution, operation and maintenance strategies that local IPPs, especially in very young IPP markets, typically lack. Second, the optimization of large power plant portfolios through standardization, O&M intelligence from the existing plant fleet, asset engineering risk management, and fuel supply and trading are of central importance to established EEFs. Third, in order to support the local incumbent, large players can draw upon their broad experience with market regulators and changing competitive conditions as well as technical issues such as the integration of intermittent power production, addressing balancing power developments, the development of exchange markets, and cross-border market integration.

Matching these capabilities with local needs is only the first step. In order to make an appealing case to a local partner, capabilities must translate into added value. In other words, the direct impact on the IRR of a specific project must be assessed, even if based on assumptions made prior to the market entry. It is important however to not only demonstrate qualitative business enhancement but also to quantitatively improve the bottom line through (1) shortening the development cycle and therefore saving project development costs, (2) reducing CAPEX through educated procurement and negotiation skills, (3) decreasing cost of debt though stable home market fundamentals, (4) increasing revenues due to CDM benefits and increasing availability of plants, (5) decreasing OPEX through optimized O&M plans and fuel sourcing, and (6) enabling tax optimization through portfolio effects.

In summary, value drivers of the IPP business model both on market and project level have been identified as a first step. Local market needs clearly require international expertise covering the whole value chain of IPP players, which EEFs possess due to their past experience. In addition to the analysis of the competitive environment, we have now worked through the fundamentals of industry, market, and project specifics. Chapter 4 will now synthesize this information in drafting the actual business model, writing the business strategy, and collecting relevant input parameters for financial evaluations. Further details and side stories will amend the current knowledge base and serve to complete a well-informed view of IPPs in Indonesia.

4 Formulating Business Strategy

In the fourth chapter, a comprehensive business strategy for an IPP in Indonesia will be formulated, taking into account the lessons of the previous chapters. After beginning with an application of three selected strategy tools, we will then focus on drafting an integrated business strategy that gives consideration to both market and non-market factors. Thereby, the ultimate goal is to find a position that allows the firm to not only exploit opportunities but also to mitigate the external forces that most significantly threaten profits. In addition to leveraging the capabilities of EEFs that address local power market needs in Indonesia, a resource-based view of firms plays an important role in the synthesis of macroeconomic, industry, and market forces; key trends in the regulatory environment are of importance as well. Finally, detailed input parameters for financial models will be provided at the end of the chapter.

4.1 Applying strategy tools

In the spirit of Michael Porter, a Harvard Business School Professor, a good strategy emphasizes uniqueness and builds on distinctive features that are hard to emulate because they focus on creating and (!) sustaining competitive and profitable advantage. Therefore, prior to going global to entering the IPP market in Indonesia, careful thought must be spent on why to do so, how to do so, and what capabilities are needed to eventually capitalize on the business strategy. Additionally, Pankaj Ghemawat, Professor at the IESE Business School, includes a value-adding dimension to this process and measures a strategy against its value creation potential. Last but not least, David Baron, a Professor at Stanford University, contends that non-market strategy considerations are at least as important as market strategies. This statement must be considered of particularly importance in the (heavily) regulated energy business.

4.1.1 Porter's Five Forces

Evenett (2011) firmly states, "Competition is the major threat to profitability". Assuming that all threats have a systematic underlying cause, in other words that they are not random, it can be argued that profitability is not random either, but determined by the strongest of Porter's Five

Forces (Porter, 2008). Hence, "the corporate strategist's goal is to (1) find a position in the industry where his or her company can best defend itself against these forces *or* (2) can influence them in its favor." The most important implication is therefore that once the business environment changes, the ranking of the Five Forces changes, and as a consequence, the way a firm approaches the Five Forces must change as well. Summarizing arguments of Porter's "outside-in" strategic framework, one could say that the imperative of strategy development is to focus on the business environment and adjust according to the most pressing threat in order to survive. In other words, learning what makes the market and non-market environment tick allows EEFs to decide upon the following set of strategic decisions in the IPP market in Indonesia:

- How to position the company;
- How to influence the balance of the competitive threats; and
- How to exploit change in the industry.

The concept in brief

For Porter (1996), "the essence of strategy is choosing to perform activities differently than rivals do." But (1) competing against established rivals addresses only one of the Five Forces, which were coined by Porter in 1979. The others are (2) savvy customers forcing down prices exercising buying power as soon as they can choose among rivals, (3) powerful suppliers rising costs due to limited procurement alternatives, (4) aspiring entrants challenge the current business models, differentiate themselves smarter or compete at lower cost, and finally (5) substitute offerings distracting customers to the disadvantage of the whole industry. What is most important in the practical application of Porter's framework to formulate better strategies is that one ranks the forces according to their potential to damage profits, and that the most severe force is then decisively addressed. Marcus Schögel, Professor at the University of St. Gallen, once said, "if you have three problems, skip two and solve one." Even as the ranking of the Five Forces in a particular industry might change over time, constrained resources might only allow for the possibility to tackle the most severe one at a time. Needless to say, any change in the competitive (market and, as we will see under 4.1.3, non-market) business environment requires a reevaluation of the strategic response. In short, Porter's Five Forces

allow strategists to spot threats to profitability, and is a concept we will use to evaluate the likely Indonesian IPP market of the future.

Applying the Framework

The following chart illustrates what the Five Forces for an EEF hoping to become a relevant IPP in Indonesia are. It follows the sequence of first defining the market and competitors, then subsequently identifying the measures of success, the source(s) of revenue, and the cost structure to map the competitive forces into this specific context. In a final step, the Five Forces are linked to profit generation and ranked according to how severe a threat they pose to profitability.

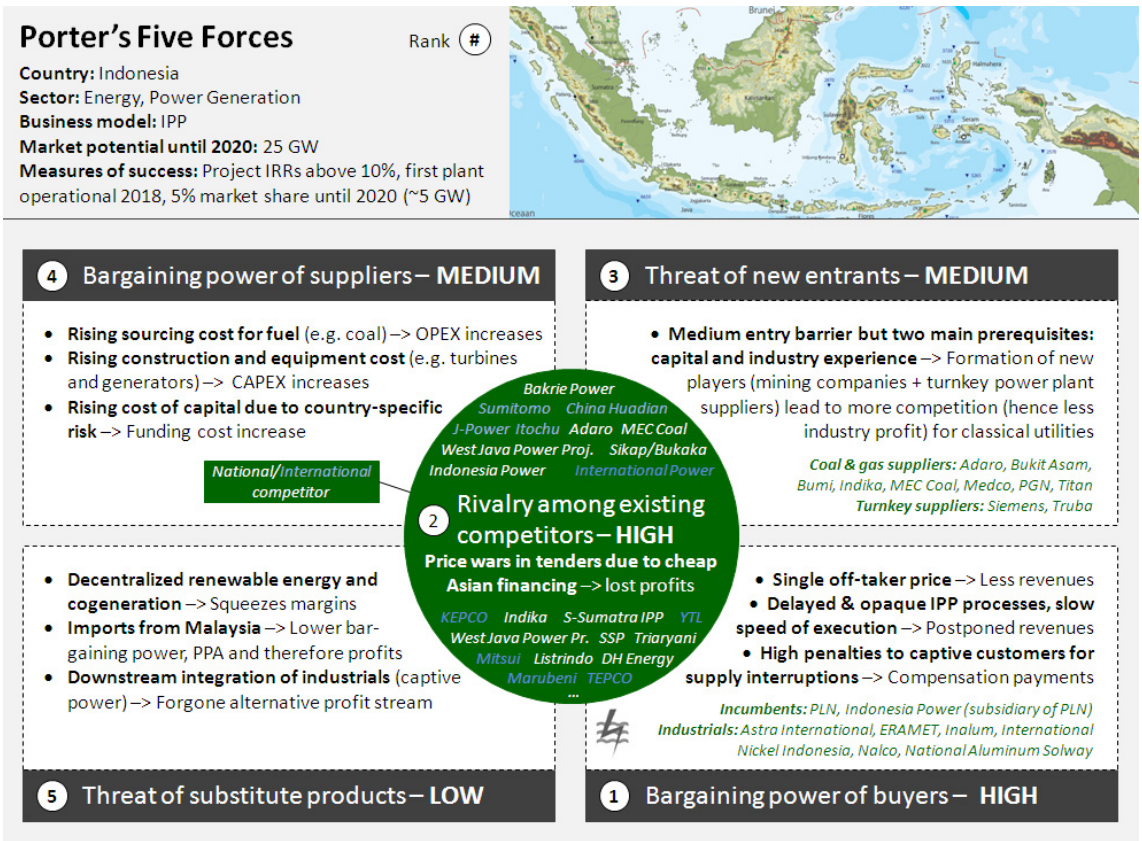

Figure 4.1: Five Forces of the Indonesian IPP market

Although Porter provides a powerful concept for strategists, Ghemawat (2007) translates it into the day-to-day business of firms by applying the ADDING Value Scorecard, a tool that we will use to elaborate more on potential sources of profits for new IPP players in Indonesia.

4.1.2 Ghemawat's Adding Value Scorecard[32]

Many companies are blinded by the extraordinary future market sizes of emerging markets that are significantly larger than their home markets. Their objectives in reaching out to these potentially lucrative areas seem to concentrate on adding revenues and increasing the size of the corporation, rather than on the main purpose of any company – profit generation. Thus the pursuit of a global strategy without any clear link to profits can be one of the major pitfalls of going global (for the sake of being trendy). This paper argues for a conservative approach towards internationalization as suggested by recognized scholars such as Alexander and Korine (2008) in their Harvard Business Review article 'When You Shouldn't Go Global.' They posit that even if there were potential opportunities for a firm, would they possess the required managerial skills to realize tangible benefits? In the end, it is not only crucial that costs do not outweigh profits but also that the economic value added, that is, accounting profits minus capital recovery costs, is positive. Ghemawat (2007) has built a coherent framework around this core objective to assess global strategies. The following paragraph will explain this method and give some insights into how to effectively apply it in the IPP market context.

The concept in brief

Ghemawat develops his concept from Porter's Five Forces and thereby identifies six components of value creation as a desired result of global expansion: **A**dding volume or growth, **D**ecreasing costs, **D**ifferentiating or increasing willingness to pay, **I**mproving industry attractiveness or bargaining power, **N**ormalizing or optimizing risk, **G**enerating knowledge and other resources and capabilities. One advantage of this scorecard is that it allows an unbiased assessment of real value creation that goes beyond simply increasing the volume and size of the company. There is also a focus on margins, where parameters of both operating costs and price levels in the respective target country will play a decisive role. Moreover, risk reduction or elimination can also contribute to the overall performance of the business, i.e. through normalizing production cycles and demand curves in order to create steadier cash flows. Finally,

knowledge creation and the leveraging of managerial experience complete the list of strategic success factors. The framework helps to avoid the hazard of relying upon a single strategic component to justify an international expansion and hence contributes to a careful assessment of the overall impacts of a firm's globalization decisions. In addition, Ghemawat's Adding Value concept stimulates creative thinking to test formulated strategies by (a) consulting the firm's past experience, (b) learning from rivals through benchmarking, and (c) considering alternative business models by in-sourcing or out-sourcing. In short, a good strategy adds value in more than one way and uses past experience, knowledge about rivals, and game-changing options to improve its uniqueness.

Applying the Framework

The next figure summarizes the discussed areas for economic value creation following Ghemawat's framework. Once again, the importance of the non-market environment is identified as the most crucial part for capitalizing on well thought-out market strategies. Despite all attempts to increase operational efficiencies, improve the exchange of managerial and technical knowledge, and mitigate local market risks, the determining factor for profit creation in electricity markets is the increased willingness to pay for superior development and implementation skills. It remains untested, however, whether PLN is willing to add a premium in exchange for strong commitment and steady, reliable project implementation. It can be argued though, that the pressure of demand will further boost PPAs as the business environment continues to gradually shift more and more towards a "seller's market".

The Adding Value Scorecard

Components of economic value	Six sources for value contribution	Achievements, attempts, or intent	Effect	Comment
Volume	1 Adding Volume (or growth)	5% market share until 2020 (~5 GW) at IRRs >10% (worst case)	+	**Performance related** not to global scale but **to national scale**
Margin	2 Decreasing Costs	Benefit from ample **availability of sites, feedstock,** and **manpower**	+	**Increase in business development costs**[1], but **decrease in CAPEX & OPEX**[2]
	3 Differentiation (or increasing willingness to pay)		+	Expected to **develop over time once** the **value proposition materializes**
	4 Improving industry attractiveness (or bargaining power)		X	**Unlikely** due to increasing activity of **Chinese utilities competing at low cost**
Uncertainty/Risk	5 Normalizing (or optimizing) risk	Zero corruption policy	–	Challenging risks due to **opaque market practice** and **global brand exposure**
Knowledge/Resources	6 Generating Knowledge (and other resources and capabilities)	Transferring know-how to and utilizing capabilities in **Indonesia**	X	**Very country-specific knowledge** due to regulation and natural conditions[3]

1) For European utilities establishing local presence but utilizing expats to underpin value proposition.
2) Compared to European plant investments for which sites are limited and technical requirements are costly.
3) Related to restricted knowledge mobility of additional learning in Indonesia.
Methodology based on Ghemawat (2007); Legend: (+) = positive effect, (X) = no effect, (–) = negative effect

Figure 4.2: Adding value through an IPP business in Indonesia

In contrast, Chinese companies competing at low cost will become a threat to other international IPPs if the latter cannot sustain or fulfill their value proposition of offering higher levels of performance that are substantially above market practice. Such a differentiation strategy would be deeply rooted in the advanced capabilities of European firms and shall be further investigated in this chapter. At this point we can see how Ghemawat builds on the initial threats of Porter and links them strongly to the very sources of a firm's profits. It is also clear that competing on cost will be difficult without compromising on quality. Therefore, while a differentiation strategy will be central to entering the market, the non-market environment might hold the key to success; thus Baron's concept is presented next.

4.1.3 Baron's Four I's

Baron (1995) states that companies operate in two environments simultaneously: the market environment and the non-market environment. Four different areas constitute the latter: **I**nstitutions (relevant decision-makers and their processes), **I**ssues (threats to profits or opportunities), **I**nterests (identity and goals), and **I**nformation (beliefs, knowledge of actors). Considered in addition to the Five Forces and the Adding Value concept of the market environment, it provides business strategists with an integrated perspective on what influences the competitive environment and hence affects profitability.

The concept in brief

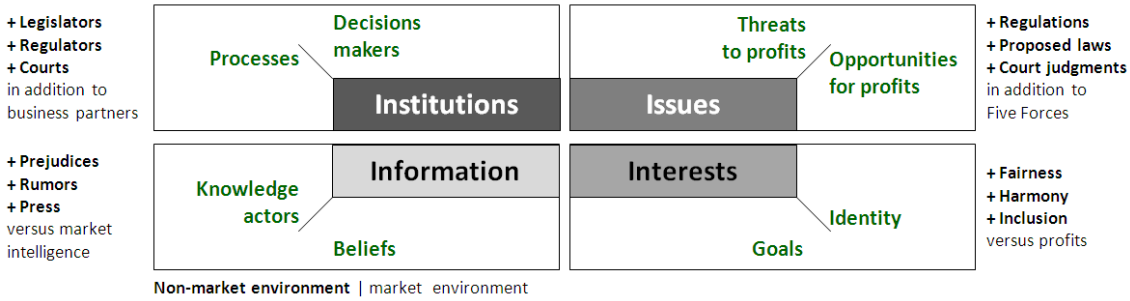

Figure 4.3: Competitive areas of the non-market environment[33]

By definition, "a non-market strategy is a concerted pattern of actions taken in the non-market environment to create value by improving its *overall* performance" (Baron, 1995). This environment is shaped by social, political, and legal processes shape this environment that can be categorized using the concept of Baron's Four I's (see Figure 4.3).

Applying the Framework

Two main threats exist in the non-market environment. First, what influential players (i.e. the GOI and/or the regulator) do in the future will affect future profits. For example, further liberalization reforms will allow many more IPPs to enter the arena and fight for their market share. Today's benefit, that is an increasingly more favorable policy environment, can thus turn into tomorrow's threat for already established IPPs. Second, lawsuits from competitors, PLN, or NGOs affect profitability and long-term brand reputation. For instance, non-compliance with market mechanisms such as tender procedures, breaches of contractual obligations and circumvention of international environmental and social standards could lead to legal threats and, if justified, to prosecution. On the other hand, collective powers can also work in favor of corporate intentions, especially if applied by several IPPs when irregularities have been observed or illicit agreements seem to hinder or delay power market participation of private entities. This, however, needs to be carefully assessed on a case-by-case situation, because the defendant (PLN, and therefore consequently the GOI) might be too large to lose – at least not in the short-term.

Table 4.1: Stakeholder mapping following Baron's Four I's

Institutions	Issues	Interests	Information
Government of Indonesia (GOI)			
President of Indonesia	Presidential Regulation No. 71 (first fast-track program) Presidential Decree No. 4 (second fast-track program)	Focus on economic growth, investement, and employment	-
People's Consultative Assembly (legislative)	Electricity Law No. 30/2009 Investment Law No. 25/2007 Environment Law No. 32/2009 Forestry Law No. 41/1999 Land Acquisition Law No. 36/2005		Decisions often driven by political motivation and political vested interests.
National Energy Council (NEC)	Advises on energy policies and regulations	Distinctive protectionism in the field of mining and export of raw materials	NEC is headed by the President and Vice-President of Indonesia and the Minister for Energy and Mineral Resources. It may therefore be assumed that the NEC's information and opinion is streamlined with that of those individuals. Towards the public NEC is relatively quiet and rarely positions itself as an institution with particular opinions or information.
Ministry of Energy and Mineral Resources (MEMR)	Policy making and regulatory authority; examples: Regulation No. 7 (use of subsidies) Regulation No. 31 (RE)		Slow and cumbersome in addressing issues such as development and introduction of favourable renewable energy policy.
Ministry of State-Owned Enterprises (MSOE)	Shareholder of PLN	Exert market power	-
Ministry of Finance (MOF)	Manages financing of PLN and also finances of the MEMR for non-PLN implemented energy initiatives such as off grid rural electrification	Stable financial situation	-
National Development Board (BAPPENAS)	Development planning and coordination with the ministry of energy is weak and often inconsistent with actual requirements.	Higher electrification rate and increased exploitation of renewable energy resources	No structured approach to rural electrification; thus programs tend to be haphazard, poorly planned and coordinated.
PT Perusahaan Listrik Negara (PLN)	RUPTL, PPA regulation, power system regulation	Maintain market dominance	Stuck between trying to be an efficient energy utility whilst being confronted with misguided policy imposed on them by the government.
Regional authorities	Local regulation	Regional development	Due to still ongoing and partly immature decentralization often in struggle with central government about autority, rights and responsibility.
Courts			
State Administrative Court	Decides over administrative law cases filed against the government	Fighting corruption, justice seeking, protectionism	-
Commercial Court	Makes decisions on bankruptcy and insolvency matters		
State Court	Handles civil disputes		
High Court	Resolves civil disputes if not solved by the state courts		
Supreme Court	Highest authority of jurisdiction		
Formal and informal networks			
Golkar Party (GP)	Protective decisions	Nationalistic views	Political parties are rarely prepared to pursue unpopular energy policy and bow to public pressure in the interests of their own political interests.
Democratic Party (DP)	Technocratic decisions	Liberal market orientation	
Institut of Teknologi Bandung (ITB)	Members on boards of almost all energy companies (incl. PLN) and in politics	Advancing influence and power of alumni	Open to connect with foreign companies active in the energy sector.
Family clans	Members across industries and politics	Advancing influence and power of family members	Sucessful clans are generally well connected with politicians and authorities enabling strong lobbying.
NGOs			
Oxfam	Supporting survivors of natural hazards and addressing community rights	Fighting poverty	Grassroots approaches; Oxfam works primarily regional with other NGOs and local government.
Human Rights Watch	Alerting minority rights	Defending human rights	-
Transparency International	Revealing illegal actions	Fighting corruption	
Amnesty International	Disclosing injustice	Defending human rights	
World Wildlife Fund (WWF)	Protecting rain forest and endangered species	Conserving nature & protecting species	
International Rivers	Addressing safety issues and negative impacts of dams	Protecting rivers and local communities	

Please note that this list shows only representative examples concerning the non-market environment and is therefore not conclusive.

Based on the stakeholder analysis under 2.2.3, the table above develops a set of non-market components that may either conflict with or support the ambitions of an IPP in Indonesia. For example, the protective actions of the GOI might delay an IPP project due to allowing PLN to develop attractive opportunities itself. Courts offer an (theoretical) option to enforce laws but might also require entering into a long and costly process that may future business opportunities with PLN and other market participants. Formal and informal networks as well as NGOs also follow their interests in a multi-stakeholder environment. Knowledge about these interests and the issues of relevant stakeholders allows IPPs to proactively manage the non-market environment and include such action in an integrated strategy.

4.2 Developing an integrated business strategy

Looking back at several analyses of the power market and energy industry specifics, market and non-market forces including the application of well-tested (Porter, Baron) and new strategy tools (Ghemawat), it is now time to synthesize everything that we have covered so far. Though some strategic implications have already been outlined throughout the previous chapters, to build a sound value proposition to the (only) client of IPPs in Indonesia – PLN – the aim is to first describe the business model derived from the findings of this thesis and, second, formulate a concrete strategy pitch in regards to a successful IPP market entry strategy in Indonesia for EEFs.

4.2.1 The IPP business model

In general, there are eight different business models in the Indonesian power sector (as presented in Table 4.2). Unsurprisingly, each of them involves PLN, ranging from a pure public model (model no. 1) to a build-own-operate model (no. 7). The latter represents the classic IPP model (with PLN as the main off-taker and tendering party). For tenders, however, PLN might choose to also include a transfer obligation of the power plant at the end of the concession/PPA period, which would add another component to the classical IPP model (BOOT instead of only BOO). Model no. 8 involves a direct JV with PLN – examples could be OCGT-CCGT conversions or new build projects in which PLN shares both the investment burden and revenues as well. Business models no. 2 to 4 are attractive for EPC suppliers (such as Sumitomo,

Siemens, or Truba) and have already been applied. Model no. 5 is especially attractive for private firms concerning hydro and coal rehabilitation of PLN power plants. Indeed, it can be assumed that PLN is mostly attracted to models no. 5, 6, 7 and 8, because they lessen the financial burden of the state-owned utility the most.

Table 4.2: Business models in the Indonesian power sector

Business Models	Financing	Ownership	Comm. Risk	Operation	Design & Constr.
1 – Pure Public (PLN)	PLN	PLN	PLN	PLN	PLN
2 – Design-Build (DB)	PLN	PLN	PLN	PLN	Private
3 – Design-Build-Operate (DBO)	PLN	PLN	PLN	Private	Private
4 – Design-Build-Lease (DBL)	PLN	PLN	Private	Private	Private
5 – Rehabilitate-Operate-Transfer (ROT)	Private	PLN	PLN	PLN/Private	Private
6 – Build-Lease-Transfer (BLT)	Private	Private	PLN	PLN	Private
7 – Build-Own-Operate (BOO)	Private	Private	Private	Private	Private
8 – Joint Venture with PLN (JV)	PLN/Private	PLN/Private	PLN/Private	PLN/Private	PLN/Private

Competing through differentiation

At this point, two important questions must be answered from a strategic perspective. First, "Where to compete?" And second, "How to comepte?" The former is more or less given by the guiding questions of this work. EEFs decide to invest in IPP projects (specifically in coal, gas, and hydro power plants) in SEA, particularly in the power market of Indonesia, under certain market and non-market conditions as outlined before. "How to compete?" requires future IPPs to decide between a low-cost and a differentiation strategy. The low cost strategy is currently executed by Chinese utilities – but not very well. Failures in the past during the first and second generation of IPPs have led to some antipathy towards cheaply built power plants. Furthermore, competing on low cost requires cheap financing, a competitive advantage currently only available to Asian developers. Thus, a differentiation strategy might hold more promising returns for EEFs and shall therefore be investigated in detail.

Ghemawat (2007) suggests consulting three sources of information for valuable strategic inputs: (1) past experience of the corporation, (2) benchmarking (how do others approach the IPP business?), and (3) (hypothetical) application of the current business strategy (of the home

market) with necessary modification to account for the new context and the local business environment. Heeding these suggestions, it becomes clear that a company should first look into its own history to recall its core capabilities and what worked well in the home market. The following three bullet points, structured in the three life cycle phases of a power station, highlight the most important skills that today's successful EEFs possess due to competent development, efficient construction, and profitable operation of power plants:

- **Capabilities in the development phase:** Site evaluation, generic plant evaluation, grid connection concept, feasibility assessment, design and engineering, environmental and social impact assessment, sustainability assessment, CDM management, integrated project management.
- **Capabilities in the execution phase:** Site management, health, safety, and environment (HSE) management, legal, commercial, and technical project and risk management, EPC procurement, contractor management, execution engineering, performance supervision, quality assurance, commissioning.
- **Capabilities in the operation phase:** Operations procedure and excellence, superior maintenance techniques, enhancement of supply and disposal, asset risk management, plant team qualifications and training, HSE management, commercial optimization, flexibility enhancement for supply and disposal, management of environmental and social issues, management of carbon credits.

In terms of benchmarking, the competitor analysis in section 2.2.3 must be recalled. Unfortunately, there are very few best practice examples for a Western utility with IPP experience in Indonesia. Only GDF Suez via International Power is active with 423 MW (pro rata) under operation and 253 MW under construction. According to their strategy statement[34], their core elements include pursuing the highest safety standards and operational performance at their plants, sharing knowledge across their portfolio, but also relying on local staff. International Power emphasizes value creation through a "local-global" combination of highly diversified people and technologies. In respect to growth markets, the British company focuses on emerging markets, and particularly on SEA. In short, International Power decided to not compromise quality and partners with strong local and Japanese conglomerates with access to competitive finance – indeed a valuable example of a thought-through strategy.

The third suggestion from Prof. Ghemawat is to explore strategic insights by applying the current (home market) business model with adjustments that factor in local (target market) conditions. This is certainly productive, as the realization of power plant projects requires similar engineering tasks all over the world. Importantly, there will be only a single off-taker in Indonesia and a fixed tariff unlike in Europe, where the market has undergone unbundling transformations and exchanges for electricity products exist; a business model for IPPs in Indonesia will have to take these structural differences into account.

In conclusion, a business strategy based on differentiation could be achieved through delivering quality quickly and cost-effectively, deploying technical skills combined with cultural competence, and adopting knowledge about local markets gained from the existing business in the region (once a critical portfolio has been developed across SEA, see International Power).

A winning business model for IPPs

Infrastructure-related business models follow a similar pattern: High fixed costs make large volumes essential to achieve low unit costs; economies of scale are key. Entry barriers are usually high and there is a distinct battle for scale and a subsequent rapid consolidation; therefore, a few big players dominate. The culture is extremely cost-focused and stresses standardization, predictability, and efficiency (Osterwalder and Pigneur, 2010). Therefore, the building blocks of a profitable business model for becoming a successful IPP in Indonesia can look as follows:

- **Customer segments:** Niche market with only one buyer (off-taker) characterized by the highly important relationship between electricity providers (IPP competitors) and the customer (incumbent).
- **Value proposition:** Quantitatively based on “Price” and speed of providing electricity (“Getting the job done”); qualitatively based on “Performance” related to availability of capacity for a certain time of the year and “Risk reduction” in terms of reliability and trustworthiness of commitments; non-Asian utilities will emphasize the second proposition through supreme capabilities in this area but without compromising too much on other tender criteria, that is price.

- **Channels:** Direct sales through the IPP according to dispatch of the incumbent via transmission networks (owned and operated by the incumbent) to the incumbent; after sales, services in terms of consultancy and recommendation regarding further power market development or new technologies to foster relationship.
- **Customer relationships:** Key account management to frequently exchange with the incumbent on both operational and managerial level.
- **Revenue streams:** Asset sale (although physically no asset is sold, rather the provision of a certain voltage level and a specified current intensity is guaranteed over an agreed timeframe); pricing according to a pre-negotiated tariff.
- **Key resources:** Capital-intensive physical resources (power plants); human resources (engineers and project managers); financial resources (upfront payment to design and construct the generation facility).
- **Key activities:** Production (generation of electricity in a power plant).
- **Key partnerships:** Optimization and economy of scale (partnership with EPC contractors to reduce CAPEX requirements, partnership with fuel suppliers with long-term contracts, and subcontracted O&M staff but trained by own personnel); reduction of risk and uncertainty (network building to ITB and the Bakri clan; partnership with strong industrial or feedstock supplier to foster local content).
- **Cost structure:** Cost-driven business model (infrastructure project) despite differentiation strategy; however, cost for know-how leverage is insignificant compared to CAPEX requirements; significant economies of scale (size of plant or portfolio) with high fixed cost and moderate variable costs (feedstock at market price, water for hydropower plants is literally free-of-charge or marginal).

It might be easy to consider this rather simple business model (compared to complex high tech ventures or start ups in the pharmaceutical industry) as a very standardized concept with little room for differentiation; this simplicity however presents a vast opportunity if a certain differentiation can be achieved. Let us further explore potential differentiation factors via available market entry options.

4.2.2 Market entry options

The following paragraphs explore the two most important elements to consider when designing business strategies in the upstream energy business: organic growth and mergers and acquisitions (M&A). In order to be comprehensive, providing captive power to industrials is listed as a secondary possibility, but is not explicitly recommended as a single market entry option.

Organic growth in the standard IPP market

In pursuit of the objective to realize new build power plants in order to establish a portfolio over time, the following market entry options can be considered[35]:

- Solitary participation in (large-scale) new build tender;
- Partnership with established or planned IPP (international or national utility);
- Partnership with local mining company (with the aim to realize existing project pipelines);
- Partnership with PLN to upgrade existing fleet;
- Solitary development of stand-alone (small-scale) renewable projects;

Entering a market with a local partner from SEA can be a successful move, as International Power GDF Suez confirms with its active partnering approach in Indonesia that includes Adaro Energy, J-Power, and Itochu Corp. The aluminum producer Adaro, for instance, contributes local knowledge in coal sourcing gained through its experience in the mining business, and also offers valuable contacts to one of its major customers, PLN.

Mergers and acquisitions of IPP stakes or companies

Mergers and acquisitions (M&A) in the IPP business occur when governments sell their stakes in state-owned enterprises, power plant portfolios or single generation assets. Most American firms left the region after the Asian Financial Crisis and the Enron scandal, but have returned recently only to find that local players and Asian competitors have been active in the market. Nevertheless, there are hardly any M&A targets available due to (a) a lack of privatization initiatives in Asian countries and (b) mainly developers without an explicit exit strategy. Domestic IPPs, like international ones, tend to stick to their assets once successfully developed

or keep so-called "sleeping PPAs[36]" for long periods. Therefore, any acquisition would require a large premium and would have limited effects given the fragmented market structure. "Generally, the challenge is to improve the IPP process, to ensure that there is more control over the timing of new generations coming online," says a senior manager of International Power GDF Suez (Asian Power, 2012).

Captive power plants for industrial off-takers

Indonesia's "Value Add Law", anticipated to take effect in 2014, aims to constrain the export of commodities (mainly low rank coal) and extend the value chain within the country via downstream optimization of domestic industrials such as mining, oil, agriculture, chemical and metal companies.[37] Consequentially, this will lead to a rising demand for captive power and, as already indicated in the competitor analysis, to an increasing number of mining companies and industrials integrating downstream (for captive use) and entering the IPP business (through selling excess capacity to PLN as a first step and diversifying into the power business thereafter). This emerging regulatory pressure could make local players in the coal business seek (international) partnerships in order to explore the power generation business with reliable partners. Stable cash flows, access to local governments, and established connections to PLN will be valuable in-kind contributions to any joint venture. Also, the captive use of power might lead to attractive tariffs for IPPs supplying mine mouths or metal smelters, for instance. Overall, though captive power plants alone might not be enough to justify a market entry, they represent an attractive possible upside to a long-term, partnering-based IPP strategy in Indonesia.

4.2.3 Strategy formulation

The strategy formulation is structured in two main parts. The first passage covers the definition of technological scope derived from the market analysis, with the goal of mirroring market development and balancing risk exposure over several technologies. The second part outlines the key strategic elements for a successful market entry via organic growth.

Where to compete

From the perspective of an international IPP, the following portfolio composition holds the most promising opportunities for the following reasons:

- **Coal:** Significant additions across all plant sizes, largest part of the fuel mix in 2020; European IPPs can add value-based extensive know-how from existing portfolios in Europe.
- **Gas:** Increasing share due to larger 400 MW+ CCGT power plants and conversion of oil (fuel switch) and OCGT facilities to CCGT; competitive edge over the whole value chain, first mover advantage since market for large scale CCGT plants is only about to develop.
- **Hydro:** Increasing hydro-based generation due to the need for environmentally balanced portfolios, huge potential, less competition, greater process control through origination and tender advantage (direct appointment), adding value through engineering and project management excellence along the entire value chain.

Strategy statement

A European utility that wants to become a successful IPP in Indonesia can create competitive advantage through differentiation by outperforming the power market *more quickly* than its competitors. Despite the lengthy processes at PLN, speed accomplished in terms of readiness due to excellent internal market intelligence, fostered partnerships and committed provision of local and international human and capital resources will create the required competitive edge. This will lead to a significant market share of 5% in 2020 (equal to approximately 5 GW installed capacity) distributed across three different technologies – generation from coal, gas, and hydro. In order to achieve this ambitious target, the new IPP will have to excel at implementing the following elements of the strategy.

- **Capitalization on strong market fundamentals:** 6% projected GDP CAGR until 2020; 60 GW of new installed capacity until 2020, thereof 25+ GW available (coal, CCGT, hydro), unmet demand, improving regulatory environment, abundance of natural resources, renewables (geothermal) potential in the mid to long term.
- **Leverage of core capabilities:** PLN, local IPP developers, industrials and mining companies lack the financial means and technical capabilities to develop, implement, operate, maintain and increase the efficiency of their power generation infrastructure; add value through deploying a broad spectrum of own capabilities and skills along the entire energy generation value chain, ensuring optimal specification, construction, commissioning and operation (on time and budget).

- **Establishment of key partnerships:** Focus on organic growth with local key partners to gain access to relevant decision-makers and networks, fuel supply, financing, country experience, existing portfolios, and "sleeping PPAs"; support this through commercial and technical upgrades of existing, poorly maintained PLN assets to foster relationship with PLN and address the key threat (bargaining power of the buyer).
- **Achievement of a relevant position in the market:** Maintain persistence given the slow and unpredictable nature of the market; mirror market fuel mix to diversify across the different technologies to reduce risk and proportionally benefit from market growth in the respective areas.

Success factors of the IPP strategy in Indonesia

Three underlying factors for the competitive success of challengers (IPPs) in a new market are[38]:

- **Exploitation of knowledge about the off-taker** (PLN, the state-owned incumbent) including insights about formal and informal channels (very often it is not sufficient to know whom to call, but also who should call in order to actually make the receiver reply; see 2.2.3);
- **Exploitation of knowledge about local markets for talent and capital** (try to gain access to the best-educated managers and students in Indonesia through forging relationships with elite universities such as the ITB);
- **Filling legal and information-related institutional voids** (acting as intermediary where information, cultural sensitivity, and connections are important such as industry congresses, best practice solutions for concrete market liberalization issues, and advice on regulatory energy policy implementation and monitoring).

Further key strategic success factors for European players are:

- Ability to manage a complex network of relationships and stakeholders
- Government-to-government (G2G) support, ideally supported by an export credit agency
- Access to competitive funding
- Excellent project and risk management skills
- Meeting tender specifications in terms of "local content" and "power sector experience"

- Adaptation to local customs without compromising good corporate governance

4.2.4 Non-market components in detail

When scrutinizing the energy industry, one finds that established utilities and IPPs alike tend to refrain from communicating non-market strategies. This non-disclosure supports the idea that the normative framework for such strategies is a sensitive topic and that a thorough and effective non-market strategy leads to a competitive advantage, especially in the electricity generation sector. This section will therefore carefully examine the most relevant, guiding policies for IPPs and further elaborate on the specifics of the state incumbent. This will reveal a dilemma posed by the divergent interests of economic nationalists (monopoly advocacy) and IPPs (increasing competitions through market liberalization). Non-market constraints eventually create a compilation of external factors that threaten both state-owned firms (PLN) and the newly-arrived IPP proponents. Therefore, the following paragraphs will highlight key objectives to pursue through non-market activities by taking advantage of the financial, technical, and managerial needs of PLN. Ultimately, helping the off-taker solve his problems will lead to a partnership based on trust and reliable performance.

Non-market fundamentals in the energy business[39]

Well-conceived non-market elements of business strategy are the keys to lasting success in the energy business, a sector still not used to tough competition. The OECD recommends looser bonds between governments and electricity producers as well. Irrespective of the level of privatization however, social, political, and environmental concerns necessitate a regulatory framework for both private and state-owned enterprises in order to enhance competition and address existing virtual monopolies. Such measures clearly affect corporate strategy, as they structure markets through adapting entry and exit barriers, alter cost structures by changing employment and pollution rules, affect demand for products via taxation, and limit access to scarce resources. Coen et al (2010) adds, that '*ironically, deregulation actually increases the influence of regulation*', a phenomenon called '*free market, more rules*'.

Still, the non-market environment has not been researched to a satisfactory extent and few management teams pay adequate attention to its forces (Coen et al, 2010). In any case, the

policies and regulations of the state can and will affect many areas relevant to businesses such as

- **Business culture** of the country (legal framework, tax system, competition stimulus etc.),
- **Corporate sector** (types of ownership, trade implications, value chain relationships, etc.),
- **Financial system** (sources of finance, fiscal policy, monetary policy, etc.),
- **Labor market** (trade unions, dispute settlement mechanisms, training, etc.), and
- **Product markets** (standards setting, environmental norms, etc.).

As we have seen, governments seek multiple objectives when making decisions; this leads to trade-offs, in which outcomes are often determined by the basic beliefs and value systems of political parties. A broad, compromise-based decision-making process is not an ideal method of reaching optimal results for all parties involved, but should generally benefit society overall. Nevertheless, when looking at an IPP from a business perspective, the management team is primarily accountable for the economic results of the company. The main objective is therefore to protect the business from possible adverse impacts of regulation (increasing costs and competition result in less profitability) and to seek advantages from favorable rules supporting strategic targets (increasing market share through higher competitive advantage or hindrance of competitor's progress).

Based on this statement, Coen et al (2010) list three implications for non-market strategies:

- Before entering the public stage, managers should assess their relative bargaining power in negotiations with governments.
- Managers must negotiate with foresight, enabling them to turn the outcome into market power and competitive advantage.
- Managers should also factor social and legal aspects into corporate strategy for which the public and NGOs will hold them accountable, whether they like it or not.

Dealing with incumbents

In his research, Coen (2005) concludes that incumbents possess a clear strategic advantage in influencing the regulator for two reasons; first, a large physical resource base to effectively communicate with state representatives can only be activated by the market leaders, and second,

when compared to new competitors, the major incumbent usually possesses a superior grasp of the volume and depth of information that governmental authorities require in order to formulate effective policies. This is largely due to the former monopolistic systems in the energy sector and the extensive experience of its workforce compared with upstart competitors. Consequently, the state is substantially dependent upon the incumbent for information, a fact that, when applied in a non-market strategy, the incumbent can use to exert influence on the government. Based on this introduction to the inherent powers of former monopolists, further elements of a non-market strategy will be discussed in the following section.[40]

The perceived threat caused by the overwhelming involvement of the state, as discussed in many facets earlier, can also be turned into an opportunity once a company can better deal with these institutions than other firms can. Fortunately, the non-market environment is the same for all IPP competitors, so a well-drafted and duly implemented non-market strategy might be a lever to outperform rivals. Many times it is not only the poor capabilities of incumbents that cause deals in the power sector to fail; I would argue that poor preparation on the private side and a misguided interpretation of the IPP's role in the game are the real showstoppers. This primarily happens because companies fail to acknowledge that market entries do not happen overnight. Identifying key stakeholders at the relevant authority (here: PLN) is an absolutely vital first step, but learning who they speak to and rely on in their decision-making process is an important second. This is far from corruption – quite the contrary! Information about negotiating parties can never be sufficient enough in the event of meeting with officials. Second, while much time is typically spent analyzing the market, relatively few efforts are made to actually draft a stakeholder map and forge alliances in the non-market arena. Therefore, IPPs should aim to eliminate these obstacles by considering initial steps towards a successful non-market entry strategy from the beginning of the business venture.

Negotiation skills

The Canadian Commercial Corporation (2012) suggests three elements for achieving success in the informal business environment in SEA: Personal connections, third party intervention, and negotiation skills. Decision-making generally takes place in informal settings, and bargaining power usually rises with influential connectors both parties can rely on. Further, the agency says that staying calm and patient during drawn-out bureaucratic processes will eventually provide

firms with competitive advantage. Criticism should only be used in small doses, allowing organizations and institutions to assume responsibility rather than individuals. In short, European companies should take steps to avoid simple cultural pitfalls when aiming for serious long-term partnerships.

Addressing the normative frame

Four distinct, key success factors can be identified to effectively deal with circumstances in the non-market environment of SEA. First, leveraging government guarantees and liaising with the ministries that hold influence over the power market's development, such as the MOE, the MOF, and the MEMR, can help to connect with local decision-makers quickly. Second, supporting local industries through domestic procurement decisions not only bolsters the sustainability parameters of projects, but also shows credible commitment to local involvement beyond forming alliances with well-connected partners. Above all, differentiation comes from honest intentions and careful negotiation tactics and the diligent and professional execution of agreements. In particular, the first project will be key to unlocking further concession rights based on tangible results rather than promises for the future. Possible channels for constantly communicating the intent for long-term commitments in the market could be embassy events, industry conferences, or even direct (free-of-charge) recommendations to the state-owned utility on how to address new technology applications (e.g. pumped-storage plants), pricing model issues, risk management challenges, or the search for valuable industry supplier or consultancy contacts.

4.3 Verifying aspirations in a business case

This section of the thesis shall reveal whether the previously developed business strategy is worth further exploration by amending it with relevant business case input parameters for an EEF willing to embark on IPP operations in SEA. The selection of Indonesia from the ASEAN-5 group is not only founded on market fundamentals and aspects of the non-market environment (chapter 2), but also takes value drivers for typical EEFs (chapter 3) and the cornerstones of business strategy formulation (chapter 4) into account. Taken together, this synthesis will be most effective in the Indonesian market, although the limitations of this approach must be acknowledged due to necessary generalization about company-specific capabilities of EEF. The

following passages complement the strategy with concrete business case figures allowing strategists to commence generic evaluations and thereby test the strategy.

A generic valuation of the IPP business model covers such relevant aspects as funding, investments, operational expenditures, and required PPA tariffs. In order to support a realistic case study, existing market practice and recent research on this topic will be taken into account. For the purpose of this thesis, however, the emphasis of this section lies on the identification of reasonable assumptions and relevant input parameters than on the actual creation of the financial model itself. The following paragraphs shall thus be seen as a starting point for critically considering a business case for a concrete IPP venture in Indonesia or SEA. As such, they strive to add a financial perspective to the already covered market, value creation related, and strategic aspects of IPPs in order to eventually conclude the paper (after the final risk assessment) by answering the fundamental question of whether it is worthwhile to pursue an IPP strategy in SEA.

4.3.1 Relevant input parameter

Project investment decisions in SEA must carefully follow a coherent assessment of different project opportunities identified by market potential studies, partner analyses and due diligences. In order to compare the options using standardized valuation instruments, relevant input parameters for DCF-based project rankings are critically discussed. The model characteristics of a generic Indonesian IPP plant can be assumed as follows:

- **Lifetime:** Coal mine mouth 25 years, coal 40 years, CCGT 25 years, hydro 50 years (but at maximum the PPA duration or concession length, usually 30 years).
- **Weighted average cost of capital (WACC):** Depends on the utility but usually between 9 and 10% for thermal plants and 8 and 9% for hydropower plants.
- **Hurdle for positive investment decisions (example only):** WACC + 1 to 3% excess yield (covering additional risk or return expectations not reflected in the WACC).
- **Leverage:** A debt/equity ratio of 80/20 or 70/30 is market practice; yet for project ranking purposes an unleveraged project (that is 100% equity financed) shall be assumed to fairly evaluate the relative project attractiveness.

- **CAPEX:** According to reference projects in the region and specific cost benchmarks such as 1,200 to 1,500 USD/kW for coal, 900 to 1,100 USD/kW for CCGT, and 1,800 to 2,500 USD/kW for hydro.
- **OPEX:** According to reference projects in the region and specific cost benchmarks such as annually 25 to 30 USD/kW for coal (note that fuel costs are assumed to be passed through to the off-taker) and 1 to 2% of CAPEX (or 2 to 2.5 USD/kWh) for hydro.
- **Production:** Contracted energy availability for thermal plants (known as load or plant factor) between 80 and 85%; for hydropower plants it depends on the type of technology and is very project specific (high for run of river plants, low for storage plants).
- **PPA:** Prices comprise a fixed capacity payment and, if applicable, an energy fee for variable fuel costs in USD; PPAs are very project specific and to a large extent CAPEX driven; recent IPP projects achieved 45 USD/MWh (30 USD/MWh capacity payment + 15 USD/MWh energy fee) and 65 USD/MWh (capacity payment only; hydropower plant).
- **Terminal value:** Not considered.
- **Inflation rate (USD):** 2.5%.
- **Corporate tax rate:** 25% (upsides such as project-specific tax exemptions are not modelled).
- **Financial criteria for decision-making:** IRR and net present value (NPV) calculation with development year used as base year.
- **Range of project IRRs:** 10% (worst case) to 14% (best case).

4.3.2 Financing structure

As already indicated in chapter 3, the funding arrangements of an IPP project can have a significant impact on the WACC and, as a direct consequence, on the PPA tariff which enables the project developer to break even. A strong credit rating for the SPV holding organization(s) could lead to an advantageous position in terms of cost of equity. Export finance and G2G programs are also powerful options for optimizing the financial structure of power plant projects. As an example, the following chart shows the IPP finance structure for the Paiton III coal-fired power plant.

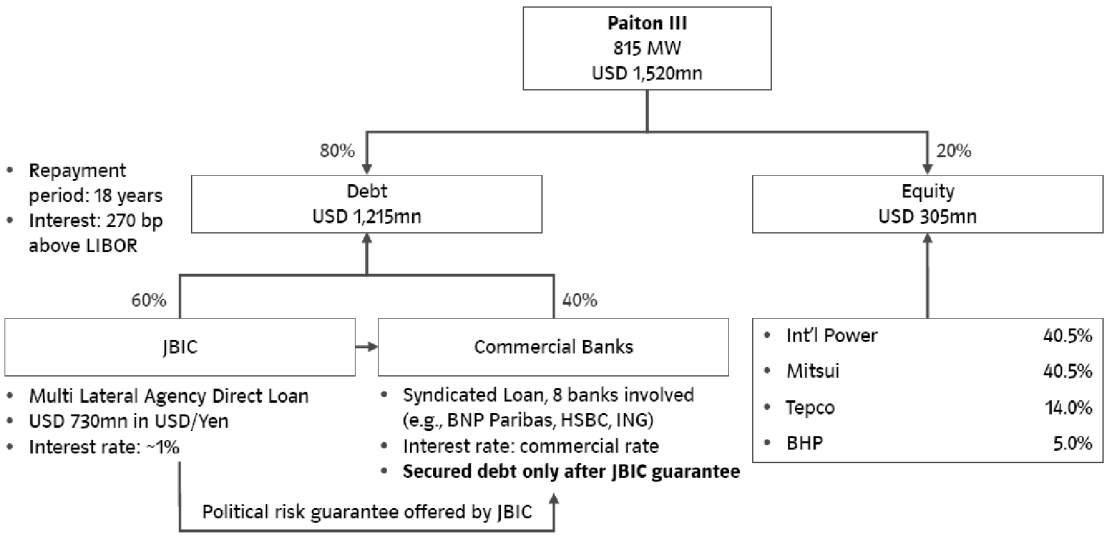

Figure 4.4: IPP financing structure (example)[41]

Without a doubt, securing low interest rates (around 1%) contributes significantly to a winning tender strategy in Indonesia; the proponent can then bid for a relatively low PPA price, which increases its competitive advantage to a level that is difficult to challenge with dissimilar weapons, that is, international financing conditions.

4.3.3 PPA tariffs

In principle, there are two different ways to determine a tariff. The first approach (typically applicable for hydropower plants) uses a so-called "Cost Plus" method, where the developer is allowed to earn a certain margin on top of his expenditures – to be determined in the PPA negotiation with the off-taker ("Direct Negotiation"). In the other approach, the government invites IPPs to submit bids, asking for the lowest (most competitive) price for a certain (thermal) concession ("Tender"). Both methods are common and both require a detailed assessment of development risks and estimated project costs. For example, grid connections might not exist in remote areas, which could require the network owner to evacuate the power via new transmission lines – to be built either by PLN or the IPP. Though the construction costs of transmission lines can be indirectly reflected in the PPA between the parties, they bear additional risk for the developer. Therefore, scope, terms and conditions are as important as the PPA tariff itself.

PPA tariffs in Indonesia[42]

In Indonesia, PPAs for thermal power plants are awarded via tender but are subject to follow-up negotiations. The costs for the projects are calculated bottom-up in USD or IDR. For hydropower projects there is a set tariff floor but prices are subject to direct negotiation. The PPA is structured in two components (see Figure 4.5), a fixed capacity fee (CAPEX, fixed OPEX, return on investment) and a variable energy fee (fuel cost, variable O&M costs). Fuel costs (for fossil plants) are passed-through to the off-taker, but the IPP bears the risk of fuel availability and guarantees a certain percentage of the installed capacity (e.g. 80%) to be available throughout the year (equivalent to full load operation for 7,000 hours, for instance). For this capacity PLN has a take or pay obligation, whereby the incumbent has the obligation to off-take the energy or pay a provision for not buying it.

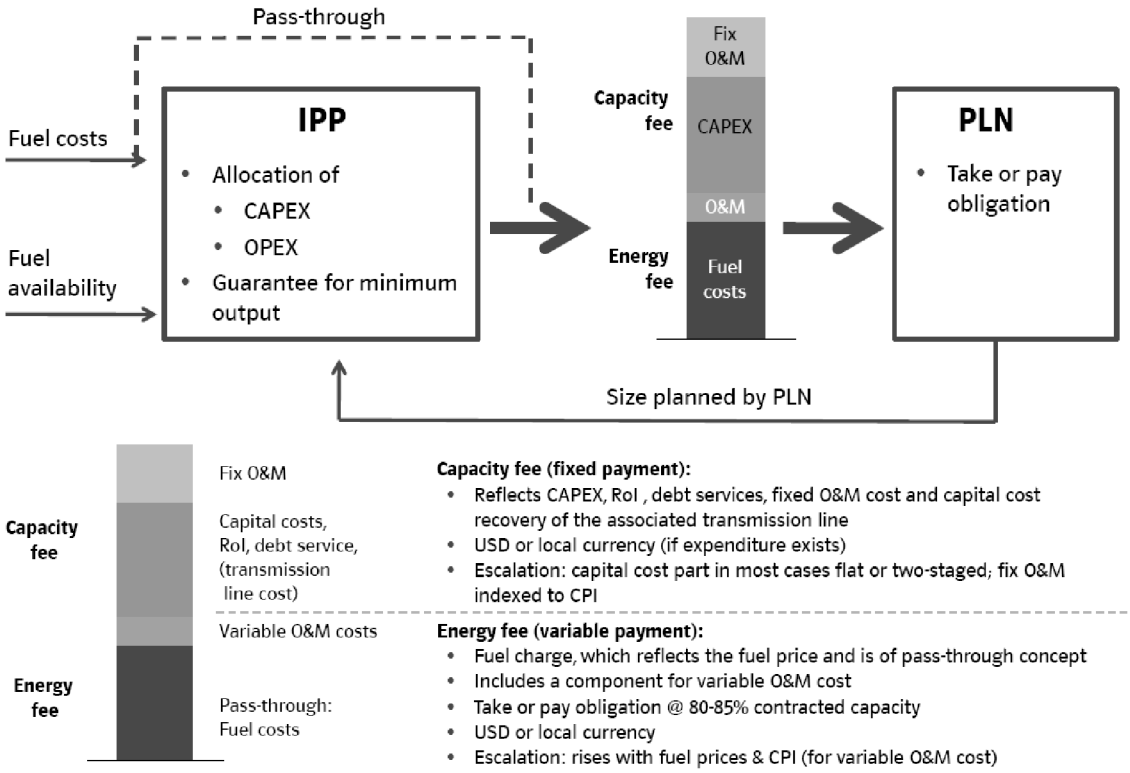

Figure 4.5: Indonesian PPA structure[43]

In determining the PPA tariff, the private developer can assume a certain level of equity IRRs between 12 and 14% (according to market experts in the region) which is backed by the Government of Indonesia (GOI). It should be noted however that there is no such thing as a standard PPA in terms of absolute value; PPA negotiations always take project specifics into account. In conclusion, understanding the pricing mechanism is vital in deriving the required PPA tariff for a certain project. Additionally, maintaining control of the cost of projects, especially those with high quality standards following the value proposition of the business strategy, is paramount; sophisticated engineering should not automatically lead to higher costs, but rather to worthwhile investments.

5 Identifying and Mitigating Risk Exposure

Markets, business partners, and specific projects represent three major levels where the new market player must make risky decisions. European utilities should therefore plan ahead to actively manage risk to the greatest extent possible by controlling for variability, uncertainty and unforeseen events. Although not all barriers can be removed, their circumvention or reduction is key to unlocking the potentials of SEA. In fact, effectively dealing with the market and especially the non-market environment, which as we have seen can be a vital source of competitive advantage – not only through filling institutional voids but also through connecting to decision-makers at the government level in order to sooner anticipate changes and prepare accordingly. In terms of power plants, technical complexity has to be managed and the risks associated with all stages of project development, implementation, and operation must be considered in order to live up to the value proposition of being a reliable business partner with extensive technical know-how and sensitivity to local environments.

Risk management is central to the IPP business. Poorly managed risk can translate into lost profits, reputational damage, withdrawals of licenses to operate, and high sunk costs. The customary risk management schools of thought offer five ways to deal with risk: (1) Preventing by doing things differently (often an unrealistic scenario), (2) Planning for contingency (a rather passive action), (3) Reducing or Mitigating by taking action to affect the likelihood or impact of the risk, (4) Transferring via insurance or contracts, and (5) Accepting because any mitigation strategy will cost more than the loss associated with the actual risk. This section assesses the three major sources of risk from the perspective of an IPP: the business environment, the physical environment, and the project environment. Given that each project has unique attributes according to different local conditions, only a few of the most relevant risks will be presented; the following selection should be seen as a foundation for general investigations which must be tailored for individual cases and adapted to local context.

5.1 Business risks

On one hand the business environment can be a source of opportunities, but on the other hand, it can also lead to higher risk exposure. From a macro perspective significant factors are the country risk as well as the legal and regulatory risk, whereas from a micro perspective there can be significant off-taker and partner risk. The macroeconomic factors were outlined in chapter 2; the others are discussed below.

5.1.1 Off-taker risk

IPPs look for stable revenue streams in order to meet financial obligations and repay their debt. Because the income stream in most cases depends on one off-taker, usually the state-owned incumbent, non-payments for capacity provisions and energy generation pose a definite risk to the operator. In the wake of the Asian Financial Crisis, as mentioned before, Indonesia's major off-taker PLN could not pay its bills to IPPs. The creditworthiness of an off-taker, the possibility of state guarantees (such as the Indonesian IIGF) covering off-taker payment obligations, and adjustments for inflation and exchange rates should be investigated in detail. Although most parts of this paper are concerned with entry strategies, finding partners, and achieving project and financial closure by signing agreements, it is worth mentioning exit options as well. Such termination and buy-out clauses in PPAs, for example, include the event of the off-taker's and the IPP's default as well as force-majeure (Butler, 2008). In short, the off-taker risk cannot be avoided but must be mitigated, ideally by sovereign liability and contractual provisions assigning indemnification rights in the event of the contractual partner's default – under the condition that contracts are enforceable in the respective jurisdiction.

5.1.2 Legal and regulatory risk

According to Lamers (2009), there are relevant non-economic barriers and institutional voids hampering investments in SEA such as market limitations (asymmetrical availability of market information, lack of experience/trust among banks or investors, unclear grid connection rules and/or pricing mechanisms, cost and difficulty of grid access) as well as administrative and regulatory constraints (lack of coordination between different authorities, high number of authorities involved, complexity obtaining permits and legal appeal procedures).[44] Such

constraints are relevant in terms of gaining concession rights, planning consents, construction permits, and operating licenses. Also, securing property rights can be difficult, especially in rural areas where land ownership registers do not exist and conflicting claims are made by private persons, local authorities, and the central government. Identifying and compensating landowners for their property is a complex and lengthy process in Indonesia, especially because of the amount of public consultation that is necessary to avoid irregularities and secure a baseline for fair compensation. Similarly, expropriation risks related to assets of national importance (large storage plants, pumped-storage plants, nuclear power facilities) must be reviewed carefully.

The stability of the regulatory and institutional framework, including permitting processes, is the single most important factor in financing energy infrastructure projects. As presented in chapter 2.1.3 and 2.2, significant regulatory issues include:

- The rules of the electricity market where the project will operate;
- The track record of the regulating agency;
- Mechanisms in place for tariff adjustments;
- Changes in the law and the financial equilibrium of the concession; and
- Changes in the tax system.

Tender rules for IPPs require provding local content; therefore teaming up with a partner is necessary for new market entries. Also, the tender consortia must be fixed at a pre-qualification stage that calls for both the stamina necessary to endure the entire process coupled with the facility to meet tight deadlines with little advance notice. In the worst-case scenario, tender rules are changed along the way. Thus, permanent and diligent monitoring of the regulatory environment is of paramount concern for the successful IPP.

Unfortunately, legal and regulatory risks are difficult to mitigate since they derive from the larger context of the non-market environment. Business strategists of EEFs will have to carefully look into these risks particularly in regards to the selection of target countries and business partners that best match with their institutional capabilities. From a legal perspective it is also crucial to assess which authority has jurisdiction over the awarding of project concessions. In SEA this is not always crystal-clear and the central, regional, and local

authorities might even disagree between themselves, often to the disadvantage of the developer due to time-consuming decision-making processes. Site access, land ownership, and property rights are closely linked to this question and must be taken into account by the developer. Like other business environment risks, legal and regulatory issues cannot be eliminated but should be significantly reduced through careful analysis and adaptation to local business environments. Whenever possible, contracts should include arbitration in Singapore to make sure that claims can be enforced. Another option might be political risk insurances. Also, the selection of a capable business partner is helpful in mitigating some of the legal and regulatory impacts and reducing overall risk exposure.

5.1.3 Partner risk and corruption

In a recent article (Kraus et al, 2012), World Economic Forum participants agreed on two major factors that influence the business environment in SEA: first, the growing reach of Chinese influence over the region and, second, the ever-present corruption at many levels of society. Competing with China will be increasingly difficult given the scale effects of Chinese production, but should be feasible with higher-quality products. What hampers business the most therefore is the prevailing high level of corruption. An international ranking by Transparency International, a non-government organization, proves that corruption remains an issue in SEA in general, and is particularly prevalent in the Philippines, Vietnam, and Indonesia. In 2012, the countries are found at the ranks 129, 112, and 100 (out of 183) and score only 2.6, 2.9, and 3.0 points (out of 10), respectively, on the Corruption Perception Index (CPI)[45]. Although Thailand (rank 80/3.4 points) and Malaysia (rank 60/4.3 points) perform significantly better on the corruption metric, they also have room for improvement. In order to effectively address moral hazards on the corporate level, EEFs should not only apply their own strict corporate governance rules but also demand transparency from their local partners. Besides following customary laws, IPPs should not give in to offers from government officials or intermediaries that in any way lack transparency. Finally, local partners might be helpful in enforcing a clean code of business conduct and bridging the gap between international practice and local business customs.

One can see that though the most significant business risks can only be partially mitigated, they also present some of the main pathways to the premium that can be earned in emerging markets. Eliminating them completely would very likely erode potential profits as well.

5.2 Physical environment risks

The physical environment mainly affects IPP projects through fuel risk, geotechnical risks, technical risks, environmental risks and social risks. Power plants are massive infrastructure investments that require land, use natural resources, and have significant impacts on their surroundings. From a technical view there are mitigation strategies available that might solve most issues but these usually do so at high cost. Limited financial resources must therefore be used such that the overall tradeoff between risk acceptance, mitigation, and avoidance leads to a balanced and sustainable project. This section therefore deals with very tangible types of risk, the impacts of which can be measured and therefore reduced if proper actions are taken early in the development stage.

5.2.1 Fuel risk

Since a vast majority of IPPs are conventional (thermal) power plants that rely on coal and gas to fuel the combustion cycle, they are inherently exposed to commodity price risk. The majority of IPPs source their fuel inside the home market, which leads to additional cost impacts when shortages in domestic coal or gas supply occur. Hedging or flexible PPA pricing can mitigate these risks, but these strategies (especially the second) would also be in effect if prices fall, hence causing diminishing returns when commodity markets are favorable. A second issue in respect to fuel price is the length of the contracts. PPAs for IPPs usually last 25 to 30 years, but long-term gas contracts will not go beyond 8 to 9 years[46] in Indonesia. Therefore, the IPP must be prepared to renegotiate major components of its business case along the way and factor in potential fuel price risks when calculating sensitivity scenarios. By the same token, assessing the availability and price of the fuels is crucial for negotiating the terms and conditions of the PPA, i.e. agreeing to flexible price mechanisms (as it is the norm in Indonesia) or frequent price review meetings. Concluding long-term fuel supply contracts should be imperative to the IPP.

A more general management risk regarding fuels stems from the biased selection of a single fuel source; supply constraints for coal and gas could lead to temporary shortfalls in feedstock. In conjunction with the aforementioned long-term contracts, only a balanced portfolio can mitigate such risks. Moreover, site selection criteria should certainly include secure access to coal transportation routes, gas pipelines, liquefied natural gas (LNG) terminals, or proximity to a coal mine owned by the local partner (if applicable). More broadly, a strategy based on different technologies in different development phases and geographical locations can also be a vital source of learning about supply chain specifics across Indonesia.

5.2.2 Technical risks

The majority of technical risks (siting, design functionality, design optimization, design alternatives) can be significantly reduced by engaging with industry leaders in power plant engineering. Local companies might contribute valuable market insights and collect essential data, but EEFs entering the market as IPPs would do better to rely on Western, Japanese, Korean, or Australian consulting firms to supervise the power plant design. Here the keys to sustainable and reliable technical solutions are to challenge assumptions frequently, continually consult with scholars regarding recent developments, constantly be in touch with the supplier base that moved to SEA decades ago, and apply integrated project management based on knowledge sharing and freedom of information. Learning from local experience and finding a tradeoff between overprized Western technology and traditional, basic good practice applications can lead to a balanced outcome without compromising margins or quality aspects. Above all, money is well spent on superior engineering compared to poorly designed plants, which may lack proper provisions for the environmental and social aspects that can lead to unexpected cost increases or even costly halts for the project. Still, most design work and technical solutions are based on locally provided data gathered in the field, as sources of reliable information are scarce. Therefore, the next paragraph shall dig more deeply into a risk commonly overlooked by IPPs – the data uncertainty.

Any project development of fossil and hydro power plants depends on input data such as

- Infrastructure availability for accessing the site and connecting it to the grid;
- Site-specific natural conditions including seismicity, topography, and geology;

- Availability and price of fuels (coal, gas, and hydrological inflows[47]).

Since literally all business plans, contracts, and designs are based on the relevant input parameters listed above, the quality of the data is a hidden key value driver for the overall financial success of the investments. Also, optimizations such as value engineering and sophisticated technical solutions lose their efficacy if the foundational data is weak. This might be less of a problem in developed countries, but could be a significant development risk in emerging regions such as SEA. Often, data regarding natural conditions is missing, has not been recorded, or, in the worst case, has been manipulated to satisfy a request. When considering large-scale infrastructure investments, developers must closely monitor data quality and its impact on the profitability of the project.

Geotechnical risks are mainly derived from natural disasters such as earthquakes (and perhaps also tsunamis), volcanic eruptions, landslides, and rockfall, but can also include the effects of adverse underground conditions and improper construction material on-site. Also, landfill areas, weak geology, and former warzones must be investigated in great detail before making decisions about the location of a project. Possible risk management actions include careful site selection with adequate seismic studies and geotechnical site investigations, especially if hazardous events are expected in the region (e.g. the Indonesian fault zone due to plate tectonics and its associated seismic and volcanic activities). However, natural catastrophes and site conditions occur at nature's whim; their impact can be tremendous even when the likelihood of such an event is relatively small (see the nuclear meltdown at Fukushima as a consequence of an earthquake and the resultant tsunami hitting the coast of Japan in 2011). Design provisions must at least follow local codes but ideally would apply Western standards in order to safely withstand likely events in the project life cycle (e.g. centenary flood, earthquakes with a return period of 500 years, etc.). To adequately pursue proper measures, planners must distinguish between safe operations and, in case damages are allowed, the well being of citizens in the project area. Geotechnical risks are closely related to the given natural conditions, but can be managed through educated decision-making about the project location.

5.2.3 Environmental and social risks

Thermal power plants emit carbon dioxide, which contributes to the greenhouse effect and, as a result, to global warming. In Europe, utilities must offset carbon emissions by generating or buying so-called Certified Emission Reductions (CER). Under the (soon ending) Kyoto Protocol, ratifying countries acknowledged this trading scheme and the related Clean Development Mechanism (CDM). CDM enables utilities (and other IPPs) to develop low carbon projects (such as hydropower plants) in emerging countries with a high specific carbon emission rate (often due to the amount of diesel generators used). Alternatively, new technology that reduces carbon dioxide emissions at existing facilities (such as transforming OCGT into CCGT plants) leads to the generation of CERs that can then be traded on the European Emission Trading Scheme (EU ETS) or used to offset emissions of the own (European) portfolio of EEFs. Therefore, low carbon developments enjoy the upside of green certificates, especially in the coal- and fuel-dominated thermal generation portfolios of SEA countries. Still, even low carbon projects such as hydropower plants cause both social and environmental impacts, which have to be managed by the IPP developer.

Hydropower projects with large dams create reservoirs by impounding water; consequentially significant amounts of land are inundated – an event often accompanied by the resettlement of local or indigenous people. Such an impact causes socio-economic transformations that need to be studied early in the project because they run the risk of becoming far too large to manage. Sustainability Assessment Protocols, World Bank Safeguard Policies, IFC Performance Standards and Guidelines, and United Nations Declarations and Conventions help project developers to secure their investments by applying internationally recognized management procedures and compensation measures. Still, even when in compliance with local and international laws, the social impact of projects might render them infeasible due to aggressive opposition that may cause reputational damage or substantial compensation efforts that significantly affect the economics of the projects.

Environmental and conservational issues constitute a second significant impact of hydropower plants. First, the migration patterns of fish must to be taken into account since barrages act as artificial barriers in river streams. Second, the creation of hydro plants involves extensive civil structures, which if managed improperly could have a severe impact on biodiversity. Debates

about whether numerous small-scale developments are more or less environmentally harmful than larger single plants are still ongoing. It is generally clear however that environmental issues such as hydrological resource management, erosion and sedimentation, water quality, reservoir management, and downstream flow issues play an important role in developing hydroelectric projects. As recent discussions about the ecological impact of dams on the Mekong River have shown, very large-scale developments are prone to trigger public opposition and very often increase political tensions between states along a river stretch, even when apparently unified by a joint association like the Mekong River Commission (The Economist, 2012).

In conclusion, critics have voiced strong concerns regarding the sustainability of power plant projects citing three main reasons: (1) coal-fired power plants increase carbon emissions, (2) large dams of hydro facilities require resettlement of indigenous people, and (3) environmental degradation and depletion of natural resources are "outsourced" to poorer parts of the country. Private developers face especially stringent opposition from NGOs. Therefore, they must take these obstacles into account when assessing their portfolio strategy and implement management systems to well-balance sustainability aspects of their projects.

5.3 Project risks

Risks that are typically associated with the direct project team such as management risk, economic risk, and the risk during implementation and operation of the project will be given attention in the last section of this chapter.

5.3.1 Management risk

Good corporate governance mechanisms lie at the heart of any successful venture in SEA. As indicated in several parts of this thesis, corruption is an issue that crosscuts all stages of project development in SEA. Following the strategic proposal to team up with local, well-connected partners increases the chances of success in the market, however not all connections are as transparent as they might seem, as discussed under "partner risk" in section 5.1. Legal and financial due diligence must therefore be present and active early on. Coherent governance also calls for clear processes for handling non-compliance issues and the enforcement of strict consequences if employees violate established rules. Based on good corporate citizenship,

declining certain projects for the sake of long-term partnerships also strengthens credibility. This includes not only compliance issues but also the selection of business partners, transparent and fair tenders for EPC services, and above standard labor working conditions with appropriate incentive systems and employee benefits (e.g. health insurance). In short, management risk can be tackled with thorough systems that do not compromise high standards of compliance or health and safety issues, and vehemently reject corruption. The associated liability consequences of non-conformance are significant compared to the effort required to establish good corporate governance.

5.3.2 Economic risk

Power market commentators repeatedly report that the number one obstacle to successful IPP projects is the level of the power sales tariff agreed upon in the PPA (Platts, 2012). Pricing needs to be acceptable to off-takers as well as to developers and their lenders. Public budget constraints due to heavy power subsidies further increase the pressure on the state-owned utility to enforce a tough negotiation strategy, often with the result that private investors drop projects (especially renewables). Development costs for field studies are usually considered as sunk cost, as they are necessary to obtain reliable evidence for tariff negotiations.

Obviously, one of the most frequently cited hurdles to implementing an IPP plant is the determination of the PPA price. Negotiating prices requires a thorough understanding of the expected final CAPEX and grounded assumptions about financing terms at closure of the deal. Therefore, developers face a threefold problem: (1) Without reliable offers from contractors no PPA can be signed, (2) without PPA, no financing agreement with lenders can be completed, (3) without secured financing, no EPC or turnkey contract can be signed. Clearly, negotiation skills are required to time all three components in such way that the IPP developer is able to sign all three agreements simultaneously. In this pricing game the government (and/or representatives from the state-owned utility) play the most uncertain part, and can cause the developer to update studies, renew tenders or adjust expectations of interest rates in case of a delay in the PPA pricing negotiations.

Uncompetitive financing costs are regarded as another serious economic challenge, according to power market experts in the region and as discussed earlier in this paper. European governments

and export credit agencies might not be as generous as, for example, the Asian Development Bank (ADB) or the Japan Bank for International Cooperation (JBIC). Japanese business partners could potentially solve this issue but first and foremost, an IPP should strive for fulfilling the bankability standards of international lenders including requirements regarding state guarantees, corporate governance, permits and licenses, as well as proven capabilities in the power sector. As mentioned earlier, sector-specific financial facilities such as the IIGF or the Infrastructure Financing Fund can also improve the debtor's profile and lower borrowing costs.

An interesting economic risk can also lie in the high quality-driven home market environment of EEFs embarking on IPP strategies. Unnecessarily over-engineered solutions by European engineers could lead to the deployment of power plants that are too expensive and complex, disqualification from tenders due to too high tariff expectations, erosion of investment returns on account of detailed perfectionism, and O&M failures due to unskilled workers. On the other hand, there is little experience among EEFs with cheaper Chinese equipment, which could also lead to friction between the engineering force of the home country and local market managers pressing for lower CAPEX through Asian equipment and design. Therefore, it is worth investigating Chinese technology providers in order to identify leading companies with acceptable quality standards at a competitive price level. Close technical supervision during construction and training of local staff in O&M excellence complete the list of recommended actions to fulfill a sound value proposition in the market despite these risks.

5.3.3 Construction and operation risks

Construction represents more than 80% of the overall project development budget and is therefore an important success factor for IPPs. Risks during the implementation phase of a project can be associated with geological conditions, construction management issues (including delays and claims), health and safety issues, environmental damages, and the solvency of suppliers. Additionally, during operation of the plant, compliance with social, environmental, occupational health and safety, and concession requirements must to be ensured. Managing risks related to asset infrastructure safety, stakeholder communication, maintenance, labor and working conditions, and governance demand appropriate management systems and should follow international good practice.

6 Conclusions

The last chapter shall summarize the paper's main findings, provide an outlook on future challenges, and highlight the proposed way to achieve excellent strategy implementation and thus a competitive edge in the Indonesian IPP market of the future. Finally, some critical remarks regarding the application of the presented frameworks and concepts act to acknowledge political and cultural obstacles as well as other public influences that may counteract rational arguments. This shall not only reflect the academic nature of this work but also contribute to a lively discussion about global strategy and the IPP business in practice.

6.1 Main findings and recommendations

There is a business case for European energy firms in becoming independent power producers in Indonesia. The rationale for proposing an organic growth strategy to enter the Indonesian power market is founded on three pillars: (1) Strong market fundamentals with substantial growth potential and significantly increasing power demand, (2) a local market capability gap in profitably developing large scale power plant projects which can be bridged by European utilities, and (3) improving regulatory conditions enabling increased private participation in the electricity market.

The proposed entry strategy considers an integrated set of market and non-market elements in order to achieve a significant market share of 5% by 2020, equaling approximately 5 GW at current market projections, with a balanced portfolio of coal-fired, CCGT and hydroelectric power plants. In particular, value for the sole customer (PLN) can be created through (a) leveraging core capabilities of EEFs across the whole value chain of the IPP business including development, implementation, operation, and optimization of large-scale power generation infrastructure, (b) establishing and maintaining key partnerships with both the incumbent PLN and influential market players which have access to substantial project pipelines but only limited power market experience, and (c) distinct and proactive management of prevailing risks stemming from the business, the physical, and the project specific environment.

From a financial perspective, the key value drivers at market and project level have been identified. Generic project IRRs are expected to yield between 10 to 14% (across technologies) and are based on anticipated PPA prices at current market level. Upsides lie in CAPEX reductions, access to competitive financing conditions, and tax optimizations. Finally, the key issue in implementing the strategy will be the (a) flexibility to adapt to local market conditions, but (b) without compromising on good corporate governance through (c) building intelligence about key stakeholders' interests and (d) forging strong ties with business conglomerates, industrials and influential leaders in society.

6.2 Limitations and success factors of the chosen approach

Despite all the praise for Indonesia from many commentators and managers in SEA, some critical voices lament, "It looks as if it will be a developing country forever" (WEF, 2012); still even the most pessimistic acknowledge the vast resource base of Indonesia that will ultimately facilitate long-term growth. In the short-term, however, starting an IPP business in SEA might be challenging and certainly painful to some degree. I would argue however that lessons can be learned in any fight, even if a few skirmishes are lost. Although the market can be studied looking in from the outside, there is no better learning experience than actually doing business in Indonesia. Power plants are long-term investments and steady cash flows will provide the financial means for further expansions. Even if the product (electricity) as such is simple and highly standardized, its production (generation) is definitely not. The power sector will, at least for many years to come, be subject to a certain amount of regulation, which means that IPPs reaching a certain market size may even opt in the future for increased regulation to keep new competitors out. The beauty of the business is that the customer will demand power in Indonesia; the only crucial limitation will be whether this same customer can and will pay for it.

Non-market strategies[48]

Once established, a non-market strategy may enhance business performance by creating a sustainable competitive advantage within a national market even if a comparative advantage on a European level is difficult to achieve. A significant amount of manpower is necessary to constantly monitor the changing dynamics of policy makers, which can be influenced by natural catastrophes (i.e. Fukushima, Japan) or changes in off-takers behavior (i.e. willingness to pay

for 'green' energy rather than for conventional generation), to name only two examples. Furthermore, setting productive goals for these agents at local headquarters can also be difficult. Usually to measure performance, a clear outcome is anticipated and used as a benchmark for comparison; in a non-market environment however, the process of setting and achieving goals is, by definition, never complete. Therefore it will always be challenging to isolate impacts of the non-market environment as a portion of gained or lost profitability except when forced to return concessions by authorities. Hence, pursuing a non-market strategy requires a flexibility of direction and the optimistic recognition of small steps towards success. It is certainly not an arena for impulsive, temperamental and impatient leaders aiming for quick wins.

Governments and political influence in foreign countries[49]

Governments and state-owned incumbents are often described in this academic paper as 'one' player, acting coherently and uniformly. However, the author openly acknowledges that this role can also be split into several subcategories, a possibility that would require much more space to fully elaborate upon. This issue would thus perhaps be a useful topic for future research efforts attempting to further develop effective non-market strategies.

Another issue that is only sparsely covered by scholars is the fact that foreign states may increase their level of influence in target countries by acquiring equity interests in large companies via their (partly) state-owned enterprises (such as GDF Suez, for example). The level of influence might be insignificantly small at plant level but could cause political turbulence once a major market position is achieved, for example by a Chinese state-owned investor (like China Huadian). The field of exercising political influence in other countries via subsidiaries is definitely important and worthy of deeper analysis.

Cultural differences

Depending on the country of choice, EEFs will explore a serious change in the way business is done in SEA. The cultural aspects of interaction – be it face-to-face meetings, longer informal meetings and social events in contrast to shorter formal business meetings, the power distance or the concept of time – deserve a great deal of attention to enable the successful implementation of the business strategy. Therefore, a strong implementation plan also considers cultural dimensions (e.g. according to Hofstede et al, 2010) or applies tools like Pankaj

Ghemawat's CAGE framework to measure the cultural distance between nations in order to knowledgeably prepare managers and professionals based on underlying patterns and findings. This paper only briefly touched upon aspects of Indonesian culture due to its limited scope; it is highly recommended however to further investigate and integrate this important dimension into successful business strategy implementation.

Testing and implementing the strategy

Bradley (2011) urges strategists to address ten specific areas in producing a sound business strategy: Make sure the strategy beats the market, tap a true source of competitive advantage, be granular about where to compete, put the firm ahead of trends, rest your conclusions on privileged insights, embrace uncertainty, balance strategic commitment and flexibility, eliminate bias, translate the strategy into a concrete action plan, and act upon the strategy. Although this thesis covers the analysis of opportunities, business model considerations, strategy drafting, and business case fundamentals, the concrete action plan remains to be developed and implemented by companies that will critically test the provided conclusions. Corporate strategists might hold divergent views on certain statements made in this paper, but will agree that despite the importance of preparation, nothing compares to the real-life insights gained by a pilot project, where the strategy can be tested not only on paper but also in the market arena itself. The learning curve will be steep.

Closing remark

The analyses conducted in this thesis support the statement that there is a business case for European energy firms in the emerging IPP market in Indonesia. In conclusion, I recommend actively considering the strategic option of developing a successful and sustainable business in SEA among the other internationalization strategies of EEFs going global. Alternatives to Indonesia might include other emerging markets such as Brazil, Russia, India, China, Turkey, or countries in the Middle East. Whatever the case, decisions should be built on detailed market insights and unbiased assessments. I hope that this paper has enriched the foundational knowledge necessary for the entrepreneurial decision-making of European power companies aiming to explore new territories for a promising future.

7 Appendices

This appendix contains charts and figures that provide access to further information concerning the IPP business in SEA.

7.1 Graphics

Generation technologies

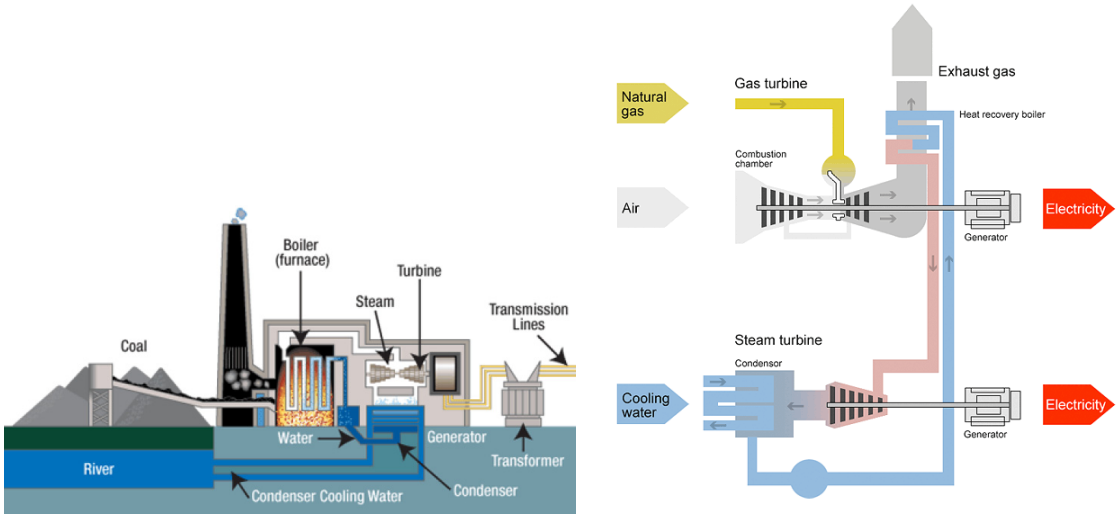

Figure 7.1: Schematic of a coal-fired power plant and a CCGT power plant[50]

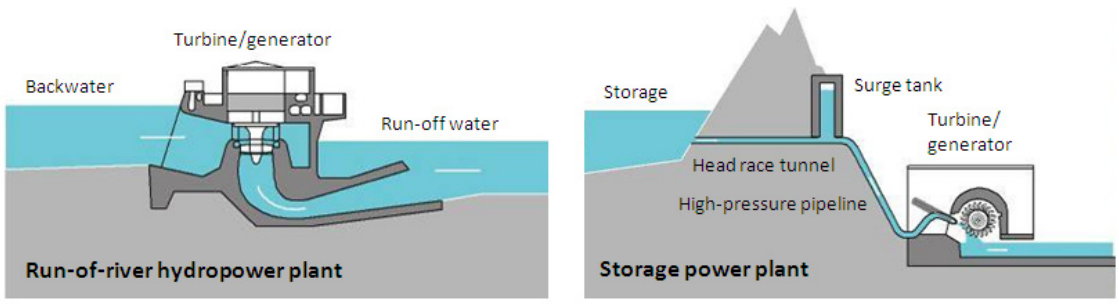

Figure 7.2: Schematic of a run-of-river hydropower plant and a storage power plant[51]

Indonesia

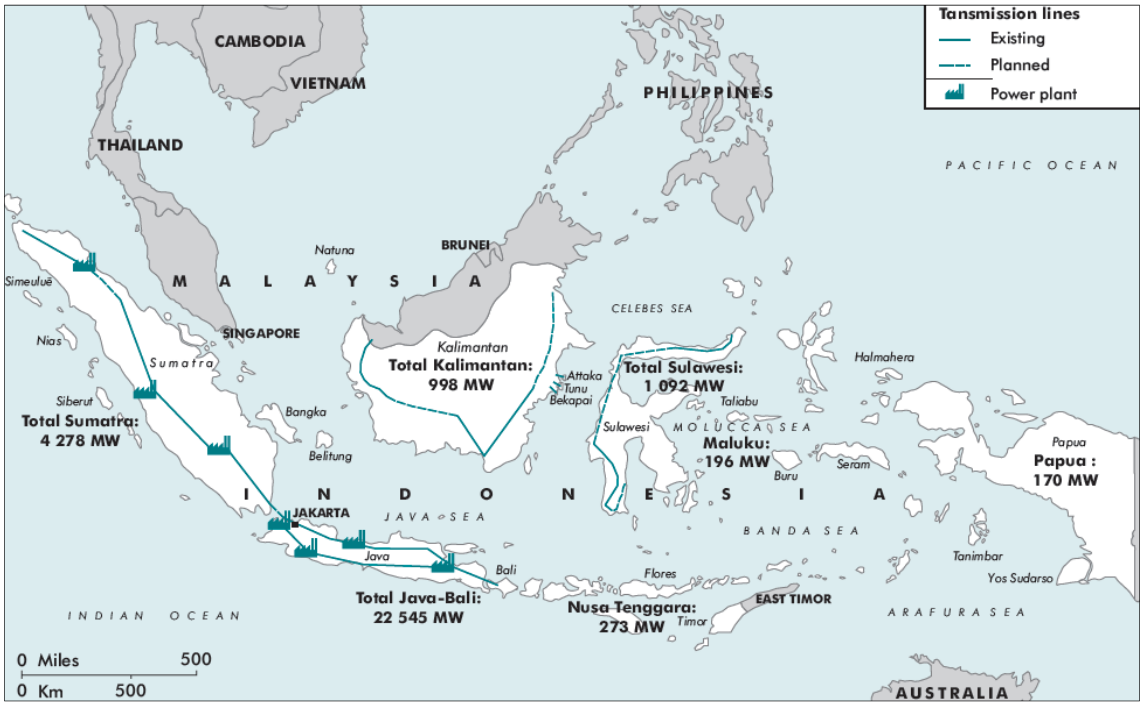

Figure 7.3: Distribution of installed capacity and domestic transmission lines in Indonesia[52]

World Bank Doing Business Ranking

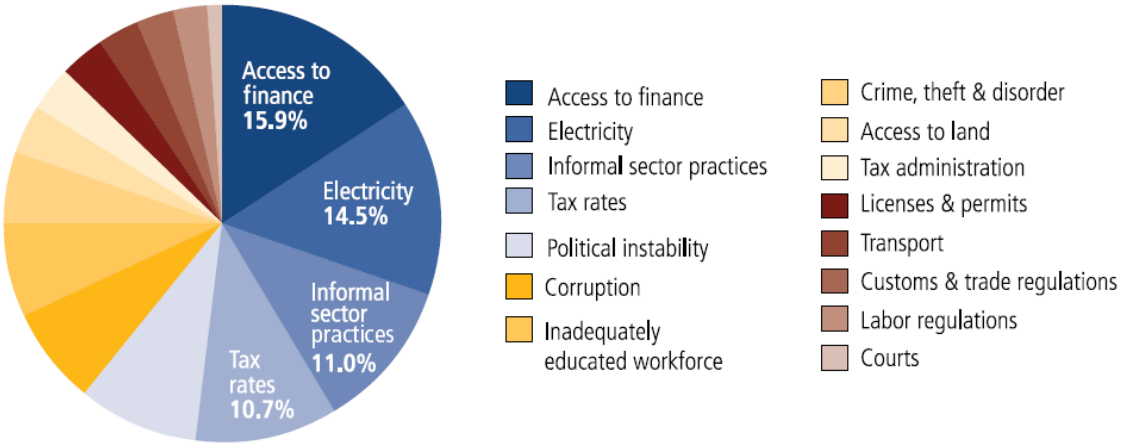

Figure 7.4: Firms consider electricity one of their biggest constraints for doing business[53]

7.2 Tables

Correlation between GDP per capita and electricity consumption

Table 7.1: Tabular data of Figure 2.2

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Annual data 2011						
Electricity consumption per capita (kWh)	**1,007**	609	3,677	592	2,073	904
GDP per capita (USD; market exchange rate)	**3,416**	3,448	9,738	2,207	5,068	1,400
	Brazil	**Russia**	**Hong Kong**	**Japan**	**Singapore**	**S-Korea**
Electricity consumption per capita (kWh)	2,201	6,133	5,924	7,833	7,948	8,980
GDP per capita (USD; market exchange rate)	12,831	13,133	34,160	46,418	49,948	22,486
	France	**Germany**	**Italy**	**Spain**	**UK**	
Electricity consumption per capita (kWh)	7,494	6,781	5,271	6,004	5,693	
GDP per capita (USD; market exchange rate)	43,879	43,807	36,201	32,383	38,520	

Sources: EIU 2011, IEA 2011

Competitiveness Profiles

Table 7.2: Tabular data of Figure 2.3

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
GCI 2012 (rank out of 142)						
Global Competitiveness Index	**49**	46	21	75	39	65
Macroeconomic environment	**40**	23	29	54	28	65
Infrastructure	**68**	76	26	105	42	90
Institutions	**74**	71	30	117	67	87
Market size	**27**	15	29	36	22	33
Technological readiness	**77**	94	44	83	84	79
Financial market development	**53**	69	3	71	50	73

Source: WEF 2012

Table 7.3: Tabular data of Figure 2.4

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Foreign Direct Investment (bn USD)						
FDI 2001	**4.1**	-3.0	0.6	0.2	5.1	1.3
FDI 2002	**9.6**	0.1	3.2	1.5	3.3	1.4
FDI 2003	**9.0**	-0.6	2.5	0.5	5.2	1.5
FDI 2004	**14.7**	1.9	4.6	0.7	5.9	1.6
FDI 2005	**24.2**	8.3	4.0	1.9	8.1	2.0
FDI 2006	**25.8**	4.9	6.1	2.9	9.5	2.4
FDI 2007	**36.5**	6.9	8.6	2.9	11.3	6.7
FDI 2008	**36.4**	9.3	7.4	1.5	8.5	9.6
FDI 2009	**20.7**	4.9	1.4	2.0	4.9	7.6
FDI 2010	**41.9**	13.4	9.2	1.7	9.7	8.0
Credit rating local currency						
S&P (May 2012)	**-**	BB+	A	BB+	A-	BB-

Sources: World Bank 2012, Standard & Poor's 2012

Power market analysis – present situation and potentials

Table 7.4: Tabular data of Figure 2.6

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Installed capacity (GW)						
Historical figure 2000	**79**	23	14	13	22	7
Present situation 2010	**126**	36	23	16	31	20
Outlook 2020	**265**	96	29	20	45	75
Growth rates (%)						
Historical CAGR 2000-10	**4.8**	4.6	5.1	2.1	3.5	11.1
Projected CAGR 2011-20	**7.7**	10.3	2.3	2.3	3.8	14.1
Access to electricity 2009						
Electrification rate (%)	**81.2**	64.5	99.4	89.7	99.3	97.6
Population without electricity (m)	**93.8**	81.6	0.2	9.5	0.5	2.1

Source: IEA 2010

Table 7.5: Tabular data of Figure 2.7

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Power market analyses						
Projected growth of real GDP 2011-20 (%)	**5.4**	6.0	4.9	5.6	4.4	5.5
Installed capacity 2010 (GW)	**126.0**	36.0	23.0	16.0	31.0	20.0
Additional installed capacity by 2020 (GW)[1]	**131.0**	60.0	6.0	4.0	8.0	53.0
Estimated share of IPPs (%)	**0.41**	0.60	0.20	0.90	0.30	0.20

1) Thailand and Vietnam excluding power imports in the order of 6 and 2 GW, respectively;

Sources: IEA 2010, International Power GDF Suez (2012)

Table 7.6: Tabular data of Figure 2.8

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Installed generation capacity 2000 (GW)						
Coal	**-**	9	-	-	-	-
Gas	**-**	8	-	-	-	-
Oil & Diesel	**-**	3	-	-	-	-
Hydro	**-**	3	-	-	-	-
Renewables	**-**	0	-	-	-	-
Nuclear	**-**	0	-	-	-	-
Others	**-**	0	-	-	-	-
Import	**-**	0	-	-	-	-
Total	**79**	**23**	**14**	**13**	**22**	**7**
Installed generation capacity 2010 (GW)						
Coal	**33**	14	7	5	4	3
Gas	**50**	13	9	3	18	7
Oil & Diesel	**13**	4	2	3	4	0
Hydro	**20**	4	2	3	3	8
Renewables	**4**	1	0	2	1	0
Nuclear	**0**	0	0	0	0	0
Others	**4**	0	3	0	0	1
Import	**2**	0	0	0	1	1
Total	**126**	**36**	**23**	**16**	**31**	**20**
Installed generation capacity 2020 (forecast) (GW)						
Coal	**107**	50	10	6	6	35
Gas	**70**	24	10	5	18	13
Oil & Diesel	**10**	4	0	3	3	0
Hydro	**42**	10	4	4	4	20
Renewables	**16**	8	2	2	2	2
Nuclear	**3**	0	0	0	1	2
Others	**9**	0	3	0	5	1
Import	**8**	0	0	0	6	2
Total	**265**	**96**	**29**	**20**	**45**	**75**
Growth rates (%)						
Historical CAGR 2000-10	**4.8**	4.6	5.1	2.1	3.5	11.1
Projected CAGR 2011-20	**7.7**	10.3	2.3	2.3	3.8	14.1
IPP share (GW)						
of existing portfolio 2010	**-**	5	-	-	-	-
of planned capacity until 2020	**-**	36	-	-	-	-
thereof already awarded/under construction	**-**	11	-	-	-	-
Remaining potential	**-**	25	-	-	-	-

Notes: "Renewables" mainly comprise geothermal plants; "Others" include energy from waste and cogeneration (decentralized combined heat and power plant); Philippine outlook estimated

Sources: PLN RUPTL 2011, TNB, Philippine Ministry of Energy, EGAT, EVN, Platts 2011

Non-market environment

Table 7.7: Tabular data of Figure 2.12

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Doing Business 2012 (rank out of 183)						
Doing Business	**80**	129	18	136	17	98
Starting a business	**109**	155	50	158	78	103
Registering property	**70**	99	59	117	28	47
Getting credit	**69**	126	1	126	67	24
Dealing with construction permits	**73**	71	113	102	14	67
Enforcing contracts	**71**	156	31	112	24	30
Protecting investors	**72**	46	4	133	13	166

Source: World Bank 2012

Table 7.8: Tabular data of Figure 2.13

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Strength of legal institutions 2012						
Getting credit	**69**	126	1	126	67	24
Protecting investors	**72**	46	4	133	13	166
Enforcing contracts	**71**	156	31	112	24	30
Resolving insolvency	**110**	146	47	163	51	142
Average (rank out of 183)	**80**	**119**	**21**	**134**	**39**	**91**
Complexity and cost of regulatory processes 2012						
Starting a business	**109**	155	50	158	78	103
Dealing with construction permits	**73**	71	113	102	14	67
Getting electricity	**84**	161	59	54	9	135
Registering property	**70**	99	59	117	28	47
Paying taxes	**112**	131	41	136	100	151
Trading across borders	**41**	39	29	51	17	68
Average (rank out of 183)	**81**	**109**	**59**	**103**	**41**	**95**
Judicial Independence 2012						
Score (out of max. 7.0)	**3.8**	**3.6**	**4.7**	**2.9**	**4.2**	**3.6**

Sources: World Bank 2012, WEF 2012

Table 7.9: Tabular data of Figure 2.14

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Ease of getting electricity 2012						
Time (days)	**70**	108	51	50	35	142
Procedures (no.)	**5**	7	6	5	4	5
Quality of supply (score out of max. 10.0)	**4.4**	3.7	5.9	3.4	5.5	3.3

Sources: World Bank 2012, WEF 2012

Table 7.10: Tabular data of Figure 2.15

	ASEAN-5	Indonesia	Malaysia	Phillipines	Thailand	Vietnam
Most problematic factors for doing business 2011						
Corruption	**13.9**	15.4	9.6	24.2	14.5	5.7
Inefficient government bureaucracy	**12.3**	14.3	12.9	18.3	11.7	4.2
Policy instability	**9.7**	7.4	8.3	7.9	12.9	11.8
Inadequate supply of infrastructure	**9.1**	9.5	6.4	16.5	5.3	7.8
Access to financing	**7.8**	7.2	10.6	2.2	3.1	15.8
Inflation	**7.1**	6.1	5.8	2.0	5.1	16.7
Inadequately educated workforce	**6.6**	6.3	8.7	2.5	8.3	7.4
Government instability/coups	**5.9**	6.1	2.9	1.9	15.2	3.6
Poor work ethic in national labor force	**5.1**	6.2	7.0	1.9	5.5	4.8
Foreign currency regulations	**5.0**	2.3	5.5	0.5	6.8	9.8
Tax regulations	**4.8**	6.0	2.9	5.6	2.8	6.8
Tax rates	**4.6**	4.2	4.0	5.7	5.6	3.6
Restrictive labor regulations	**4.3**	3.6	10.4	4.6	1.2	1.8
Crime and theft	**2.9**	2.7	4.1	5.6	2.0	0.3
Poor public health	**0.8**	2.5	0.9	0.5	0.0	0.0

Source: WEF 2011

Table 7.11: Legislative framework for the renewable energies in Indonesia[54]

Law/Policy/Program	When	Activity/Plan	Goal
Development of National Electricity Industry (2003-2020)	2003	Plan for the development of the Indonesian electricity	90% electrification by 2020
Ministerial Decree No. 2	2004	Green Energy Policy	Maximum utilization of RE Efficient utilization of energy Public awareness of EE
Presidential Regulation No. 5	2006	National Energy Policy: Energy Diversification	Reducing oil use by 20% by 2025 Increase the new and green capacity mix to 15% by 2025 - 5% biofuel - 5% geothermal - 5% biomass, nuclear, hydro, solar
Government Regulation No. 26	2006	Electricity supply and utilization	Prioritizing utilizing renewable energy for power generation
Ministerial Decree No. 2/2006 on Medium Scale Power Generation using Renewable Energy	2006	Obliges PLN to purchase electricity generated from renewable energy from facilities with a capacity 1 MW < Cap < 10 MW: FiT: 60% of utility's generation costs (low volt.) FiT: 80% of utility's generation costs (med. volt) 10 years purchase contract (may be extended)	Increasing the share of small-scale electricity generation

Presidential Regulation No. 71/2006	2006	1st 10 000 MW Fast-Track Program Crash-program to add 10 000 MW capacity Substituting oil for coal in electricity generation Conducted solely by PLN	Increasing generation capacity through fuel switch Reducing PLN's need for state subsidies
Law No. 30/2007	2007	Energy law	Energy diversification and increased use of RE for reducing dependency of fuel fossils Energy conservation
Law No. 30/2009	2009	Partial liberalization of the electricity sector to increase generation capacity and reduce capa-city deficiencies Risk-sharing between the state and private investors	Increase private participation in for electricity generation Terminate PLN's monopoly Increase regional autonomy
Ministry of Energy Regulation No. 31	2009	Application: Small-scale hydropower generation up to 10MW Contract specifications: 15 years Quantity specifications: None FiT: Low voltage: 1004 Rp/kWh Fit: Medium voltage: 656 Rp/kWh	Increasing generation capacity Increasing use of small-scale RE
Presidential Decree No. 4	2010	2nd 10 000 MW Fast-Track Program Crash-program to add 10 000 MW capacity Geothermal, hydro and biomass PLN, IPP projects or IPPs in cooperation with the Indonesian government	Increasing generation capacity Increasing use of RE Increased participation by IPP
Ministry of Energy Regulation No. 7	2010	Cross-subsidization through electricity tariff system	Providing electricity at reasonable prices

Table 7.12: Tabular data of Figure 3.2

	Resources	Installed	Comment
Technical renewables potential (GW)			
Hydro	75.7	4.2	
Biomass	49.8	0.5	
Geothermal	27.0	1.1	
Wind	9.3	0.0	
Mini/micro hydro	0.5	0.1	
Solar	-	0.0	4.8 kWh/m²/day, land area = 1,890,000 km²

Source: IEA (2008), Indonesian Ministry of Energy and Mineral Resources

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EDF, Endesa, Enel, E.ON, GDF Suez, Iberdrola, International Power, PLN, RWE, SSE

Acronyms

ADB	Asian Development Bank
AMDAL	Indonesian Environmental Impact Planning Document
ASEAN	Association of Southeast Asian Nations
ASEAN-5	ASEAN focus countries of this thesis: Indonesia, Malaysia, Philippines, Thailand, Vietnam
BAKOREN	Indonesian National Energy Council
BAPPENAS	Indonesian National Development Board
BCG	The Boston Consulting Group
BHP	Broken Hill Proprietary (BHP Billiton, one of the three largest mining companies)
BKPM	Indonesian Investment Coordinating Board
BLT	Build-Lease-Transfer
BMI	Business Monitor International
bn	Billion
BNP	Banque Nationale de Paris (BNP Paribas, a French bank)
BOO	Build-Own-Operate
bps	Base Points (100 bps = 1% = 1/100)
CA	Concessions Agreement
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CEO	Chief Executive Officer
CHN	China
CIA	US Central Intelligence Agency
CPI	Corruption Perception Index, Consumer Price Index
CSP	Concentrated Solar Power
DB	Design-Build
DBL	Design-Build-Lease
DBO	Design-Build-Operate
DCF	Discounted Cash-flow
dena	Deutsche Energie-Agentur
EBIT	Earnings before interest and tax
EDF	Electricité de France (French utility, partly state-owned)
EEF	European Energy Firm
EGAT	Electricity Generating Authority of Thailand (Thai state-owned utility)
EIA	Environmental Impact Assessment
EIU	Economist Intelligence Unit

Enel	Ente Nazionale l'Energia Elettrica (Italian utility, partly state-owned)
EPC	Engineering Procurement Construction
ESP	Spain
EUR	Euros
EVN	Electricity of Vietnam
FDI	Foreign Direct Investment
FRA	France
G2G	Government-to-government
GBR	United Kingdom
GCI	Global Competitiveness Index
GDF	Gas de France (French utility, partly state-owned)
GDP	Gross Domestic Product
GER	Germany
GOI	Government of Indonesia
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
GW	Gigawatt
GWh	Gigawatt hour
HSBC	Hong Kong and Shanghai Banking Corporation (a British bank)
HSE	Health Safety and Environment
IDN	Indonesia
IDR	Indonesian Rupiah
IEA	International Energy Agency
IESE	Instituto de Estudios Superiores de La Empresa (a Spanish business school)
IFC	International Finance Corporation (World Bank Group)
IHA	International Hydropower Association
IIGF	Indonesian Infrastructure Guarantee Fund
ING	Internationale Nederlanden Groep (a Dutch bank)
Int.	Interanational
IPKH	Indonesian Forestry Lend Use Permit
IPP	Independent Power Producer
IRR	Internal Rate of Return
ITA	Italy
ITB	Institut of Teknologi Bandung
IUPTL	Indonesian Electricity License for Public Use
JBIC	Japan Bank for International Cooperation
JPN	Japan
JV	Joint Venture
k	Thousand
KEPCO	Korea Electric Power Corporation
KKPPI	Indonesian Policy Committee for the Acceleration of Infrastructure Provision

kW	Kilowatt
kWh	Kilowatt hour
LIBOR	London Interbank Offered Rate
LNG	Liquified Natural Gas
m	Million
M&A	Mergers and Acquisitions
MEC	Middle East Coal (an Indonesian mining and infrastructure company)
MEMR	Indonesian Ministry of Energy and Mineral Resources
mn	Million
MOE	Ministry of Economy
MOF	Indonesian Ministry of Finance
MOU	Memorandum of Understanding
MSOE	Indonesian Ministry of State-Owned Enterprises
MW	Megawatt
MWh	Megawatt hour
MYS	Malaysia
Napocor	State-owned utility of the Philippines
NEC	Indonesian National Energy Council
NGO	Non-government Organization
NPV	Net Present Value
O&M	Operation and Maintenance
OCGT	Open Cycle Gas Turbine
OECD	Organisation for Economic Co-operation and Development
OPEX	Operational Expenditures
pa.	per anno
PDR	People's Democratic Republic
PGN	PT Perusahaan Gas Negara (an Indonesian gas supplier)
PLN	PT Perusahaan Listrik Negara (Indonesian state-owned utility)
PPA	Power Purchasing Agreement
PPP	Power Purchasing Parity; Public Private Partnership
PT	Perseroan Terbatas (Limited Liability Company in Indonesia)
PWC	Price Waterhouse Coopers
RE	Renewable Energies
ROR	Run-of-River
ROT	Rehabilitate-Operate-Transfer
RUKN	Indonesian Electricity Development Plan
RUPTL	Indonesian Electrification Development Program
RWE	Rheinisch-Westfälische Elektrizitätswerke (German utility)
S&P	Standard and Poors (credit rating agency)
SEA	Southeast Asia

SESB	Sabah Electricity (Malaysian state-owned utility)
SESCo	Sarawak Electricity Supply Corporation (Malaysian state-owned utility)
SHA	Shareholders Agreement
SPV	Special Purpose Vehicle
SSE	Scottish & Southern Energy (a British utility)
SSP	Sumbergas Sakti Prima (a Chinese business conglomerate)
TEPCO	Tokyo Electric Power Corporation
TNB	Tenaga Nasional Berhad (Malaysian state-owned utility)
TWh	Terawatt hour
US	United States of America
USD	US Dollar
VAT	Value Added Tax
WACC	Weighted Average Cost of Capital
WEC	World Energy Council
WEF	World Economic Forum
YTL	Yeoh Tiong Lay (an Malaysian infrastructure conglomerate)

Notes

[1] Source: E.ON Media Library (2012)

[2] An allusion to Thomas Friedman's bestseller 'The World is Flat: A Brief History of the 21st Century' (2005).

[3] Source: World Economic Forum (2012)

[4] Sources: EIU, CIA Factbook

[5] Sources: Boston Consulting Group, EIU, FDI Intelligence, McKinsey & Company, Roland Berger Strategy Consultants, WEF, World Bank

[6] Source: World Economic Forum (2012), EIU

[7] Source: Price Waterhouse Coopers (2011)

[8] Source: PLN RUPTL (2011), Platts

[9] Source: Differ Group (2012)

[10] Source: Boston Consulting Group

[11] Source: Roland Berger Strategy Consultants

[12] Source: Deutsche Gesellschaft für Technische Zusammenarbeit (2009)

[13] Source: Ruccius (2007)

[14] Source: Differ Group (2012)

[15] Source: Differ Group (2012)

[16] From a list of 15 factors, respondents were asked to select the five most problematic for doing business in their country and to rank them.

[17] Source: International Energy Agency (2012)

[18] Source: Purra (2009)

[19] Source: Deutsche Energie-Agentur (2010)

[20] Source: Differ Group (2012)

[21] Source: Price Waterhouse Coopers (2011)

[22] Source: EIU

[23] Source: Price Waterhouse Coopers (2011)

[24] Source: Deutsche Gesellschaft für Technische Zusammenarbeit (2009)

[25] Source: PLN (2012)

[26] Source: Denkbank

[27] Source: Price Waterhouse Coopers (2011)

[28] Source: Boston Consulting Group

[29] Source: www.differgroup.com

[30] Source: Credit Suisse Research

[31] Source: Boston Consulting Group

[32] Based on Möstl (2011)

[33] Based on Evenett (2011)

[34] Source: International Power Annual Report 2010

[35] „Solitary“ includes local partnership as well, but only to the minimum extent legally required.

[36] Awarded PPA but delayed project implementation due to various problems, e.g. lack of financing & technical problems.

[37] Source: McKinsey & Company

[38] Based on Evenett (2011)

[39] Source: Möstl (2011)

[40] Source: Möstl (2011)

[41] Source: E.ON Research

[42] Sources: McKinsey & Company

[43] Source: McKinsey & Company

[44] Source: International Energy Agency (2012)

[45] For more information on the detailed methodology please visit www.transparency.org

[46] Source: Asian Power (2012)

[47] According to Platts (2012) the Indonesian 600 MW Asahan 2 hydroelectric power plant achieved only half of its intended output due to water shortages, or, in other words, an overestimated design discharge. Such data misinterpretation doubles specific investment costs and results in tremendous financial (and credibility) losses.

[48] Based on Möstl (2011)

[49] Source: Möstl (2011)

[50] Source: University of Chicago and www.eon.com

[51] Source: E.ON Research

[52] Source: International Energy Agency (2008)

[53] Source: World Bank (2012)

[54] Source: Differ Group (2012)

Authorship Declaration

”I hereby declare that I have sincerely endeavored to produce a paper of outstanding quality; I have produced this paper myself, without any outside assistance except from the people and documents that I quote; I have not copied and/or pasted this paper, or parts of it, from other papers or documents available on the internet or elsewhere, except where I have explicitly stated so; I have not submitted this paper or major parts of it to another seminar or class, either at the University of St. Gallen or elsewhere, and I will not do so in the future.”

Bernhard Möstl, MSc

Landshut, June 25, 2012