

Section II - The World

Distributed Infrastructure, Community Power and Radical Affordability

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Summary

The world's population is currently growing at about the same rate as the population gaining access to electricity. According to the International Energy Agency (IEA), electrification rates will only slightly outpace population growth. What's worse, nearly 2.5 billion people today considered "electrified" receive only a few hours of electricity per day. We are losing the battle to light the world. This is important because light is essential to the empowerment of women, education of children, effectiveness of health care, and the attainment of the Millennium Development Goals.

The IEA has made clear in a series of reports that the only way to reverse this situation is to rely heavily on small scale distributed energy infrastructure in rural areas. However, current investments by governments, public institutions and multilateral banks involved in the United Nations Sustainable Energy for All (SEFA) are heavily skewed towards investments in large-scale centralized power plants and grid extension. This "business as usual" approach is guaranteed to leave at least one billion people in the dark by 2030.¹

But we have a tremendous opportunity to change course. Today, three out of every four new mobile phone subscribers live in emerging markets. Around the world, 411 million people have access to a mobile network, but no electricity to charge their phones. This communications demand has resulted in the construction of roughly 650,000 off-grid cell phone towers – all powered by costly and polluting diesel generators.

1. See: <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/05/29/heres-why-1-2-billion-people-still-dont-have-access-to-electricity/>

This offers the opportunity to create a distributed clean energy infrastructure capable of delivering power faster, cheaper and more effectively than grid extension. When combined with the rapidly changing economics of clean energy, innovative financial solutions enabled by machine-to-machine (M2M) communications, and emerging business models aimed at serving the energy poor, we have a once-in-a-generation opportunity to end energy poverty.

In order to seize this opportunity we offer five lessons:

Lesson #1: We are using the wrong yardsticks. The use of a price-per-kilowatt is inherently biased against projects that have high capital expenses (CapEx) but low operating expenses (OpEx), such as renewable energy, and rarely includes "all in" costs, such as the transmission and distribution associated with grid extension. To that problematic metric we add another: the continued use of gigawatts of supply and kilometers of transmission and distribution built. A focus on aggregate supply ensures large (i.e., centralized) sources are prioritized, even if their supply never reaches the intended recipients. Instead of using such metrics, policy-makers should judge investments on energy services actually delivered (not just supplied to the grid), households receiving power, and time to deployment, with a heavy prioritization of interventions that take effect sooner rather than later.

Lesson #2: Small is fast. At best, large-scale power plants take years to construct. Worse, they can be constructed without the accompanying transmission and distribution infrastructure, meaning that the poor never receive power. In contrast, small-scale systems can be deployed in a matter of months. One of the best examples is the Bangladesh

rooftop solar program, which is currently deploying 30–40,000 systems per month. Given the life-changing nature of energy, even at the level of the watt, we need to prioritize energy interventions on a time-scale that matters now.

Lesson #3: The money is there, it is not being spent wisely. There is plenty of capital available; it is not being allocated equitably. According to the IEA, subsidies are an extremely inefficient way to reach the poor. In 2010, developing countries provided over US\$88 billion in subsidies to fossil fuel. Only 20% of subsidies went to the lowest income groups. The money spent on subsidies dwarfs the World Bank's roughly US\$8 billion energy portfolio for 2012. We estimate that only US\$400 million (a small fraction of the bank's budget) is needed annually² to provide basic lighting services via clean energy.

Lesson #4: Ring-fenced public capital is required. Given the dearth of capital available to this sector, and its overwhelming development impact, public institutions must step in to provide targeted support. We need to mobilize public money flowing through a “fund of funds” to create products tailored to reach small-scale project levels that are currently neglected. Organizations and agencies such as the UK's Department for International Development (DFID) are financing a “fund of funds” through the Commonwealth Development Corporation (CDC) that can capitalize local financial institutions to invest in clean energy access entrepreneurs, amongst other things.³ The latter is an excellent example of how a multilateral institution like the International Finance Corporation (IFC) could make a big difference in this space.

Lesson #5: Energy efficiency leads to skinnier grids that cost less. LED lighting has revolutionized the amount of power households need to get their basic needs met, from hundreds of watts per household to 10–30W. Combined with innovative 1–2 kilovolt (kV) transformers that are designed to take this lower power and current, Skinny Grids of far thinner conductors can service many hundreds of households, and often from existing off-grid sources of power, or from the

edge of the grid. It is important to overhaul the design of rural electrification systems in order to take these modern technologies into account.

Lesson #6: Small is bankable. Crowdfunders have demonstrated that they can fill a financing void left by large financial institutions. However, we need traditional financial institutions to recognize that it's not just large projects that require finance. On a significant scale, off-grid entrepreneurs lack access to capital. More importantly, their smaller projects can have much greater development impact, which makes it imperative for development institutions to step in and provide capital where the market has failed.

Ultimately, we need larger pools of capital from development institutions and institutional investors to address this problem. Even if a modest US\$500 million clean energy access fund is created, as entrepreneurs have been demanding, the lessons we've learned will be critical to ensuring effectiveness; if there's anything we know for sure, it's that pouring more money into “business as usual” ensures “failure as usual.”

Introduction: “Business as usual” means “Failure as usual”

The world's population is currently growing at about the same rate as the population gaining access to electricity. According to the International Energy Agency (IEA), this means that by 2030 there will only be a 14% decrease in the un-electrified population (a decline from 1.3 to 1 billion people). Even worse, the nearly 2.5 billion people who are currently considered “electrified” receive only a few hours of electricity per day. In essence we are losing the battle to light the world.

As a result, the world's poor pay nearly US\$40 billion for heavily polluting and dangerous fuel-based lighting. This represents roughly 20% of the global lighting bill but only 0.1% of the lighting services produced. Put differently, the poor pay 10,000 times what we pay and they get poor light and poor health in return.

2. \$20 basic solar lanterns that eliminate kerosene lighting x 200 million households over 10 years.

3. See: <http://bit.ly/14eallf>.

The IEA estimates that US\$14 billion per year will be spent on extending energy access between now and 2030. Its central conclusion is that there is inadequate financing to address the lack of energy access. The IEA concludes that more money is needed to solve the problem, somewhere on the order of 3% (US\$33 billion) of global energy investment.

While money is required, it's far more important how it is spent. Current energy expenditures could easily end energy poverty, but they are largely funneled into an inefficient and ineffective approach to rural electrification that prioritizes large-scale centralized generation and distribution of electricity.

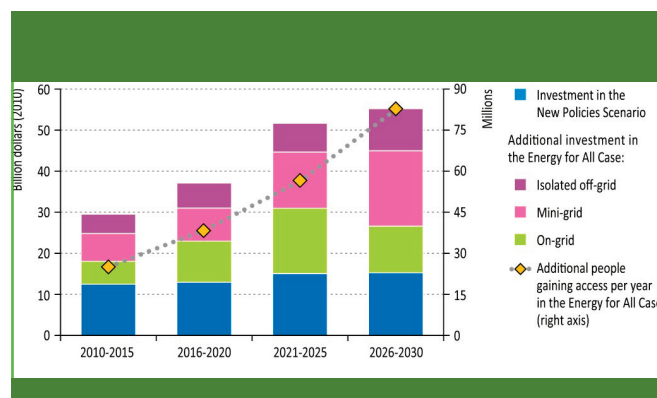
This model, unlike the 1920s push for rural electrification as a part of the New Deal in the United States, is largely failing to provide electricity to the world's citizens (outside of a few notable examples including China and Vietnam). In India, for instance, home to roughly one-quarter (300 million) of the un-electrified population, a 60% increase in the energy supply over the past decade has only increased energy access levels by 10%.⁴ High transmission and distribution costs, commercial theft, low population densities in rural areas, large numbers of existing grid-tied but marginally-served customers, and remote, difficult-to-reach areas have all contributed to this failure in India and elsewhere.

Distributed renewable energy is cheap; centralized fossil fuels are expensive

The global community must divert scarce public resources away from the unfavorable economics of centralized grid extension. The IEA has outlined a universal energy access scenario in which over 60% of all energy investment supports decentralized, clean energy for 70% of rural inhabitants worldwide. By increasing the support for decentralized renewables for rural populations, we can solve the universal electrification problem faster, more cheaply, and more effectively.

The most important factor driving the opportunity to expand decentralized systems is that there is a once-in-a-generation

4. This despite an energy access definition that defines electrified villages as those where 10% of a village enjoys access to the grid.



shift in energy economics that is up-ending the world of energy. On one hand, the cost of fossil fuel is rising and becoming increasingly volatile. On the other, the costs of clean energy inputs such as solar panels and LED light bulbs are plunging. These changes are unlocking the potential of distributed clean energy to end energy poverty.

The starkest example of rising fossil fuel costs can be found in Asian economies, which are now faced with rising plant construction and fuel price risks that are significantly affecting profit margins and future construction.⁵ A prime example is the Tata Mundra project, which is the first in a series of “Ultra Mega-Power Projects”, intended to end India’s energy supply crunch and ensure energy access. Given soaring costs, this IFC-financed project has been forced to request rate increases from Indian regulators⁶ – thereby increasing the cost of energy for average citizens and hampering energy access efforts.

Standing in stark contrast to the economic woes of the Tata Mundra plant is the price trajectory of renewable energy, which is plummeting as industries and technologies rapidly mature. The price per watt of solar modules has fallen by more than 50% from 2001–2010⁷ and another 11–14% in the United States in 2011 alone.⁸ Globally, this trend is expected to continue through at least 2015 with a further 67% reduction expected.⁹

5. Locked In: The Financial Risks of New Coal-Fired Power Plants in Today’s Volatile International Coal Market, 2012.

6. See:

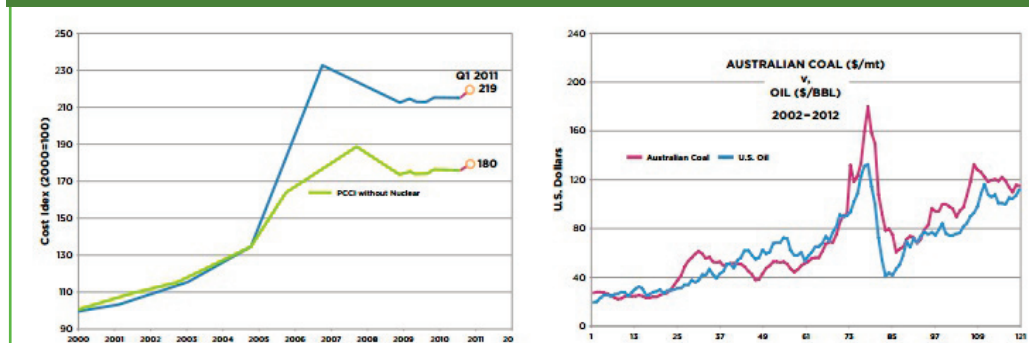
<http://www.thehindubusinessline.com/companies/tatas-allowed-to-hike-tariff-for-power-generated-from-mundra-plant/article4620284.ece>.

7. Solar Buzz, 2010.

8. Lawrence Berkeley National Laboratory, 2013.

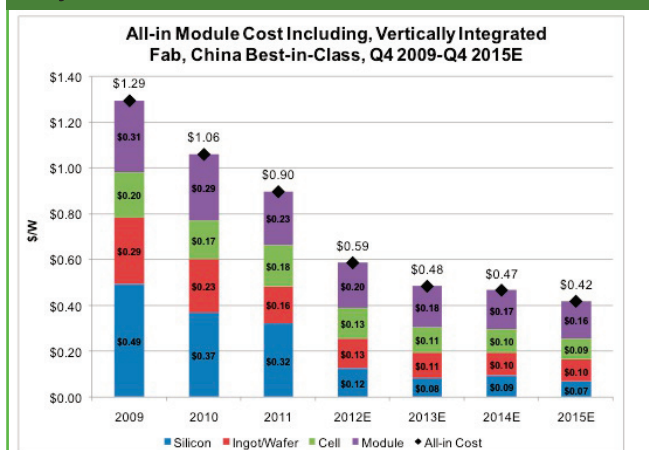
9. Greentechmedia, 2013.

Figure 2: Coal Plant Capital Costs North America, Benchmark Australian Coal Prices



Source: Sierra Club, 2012.

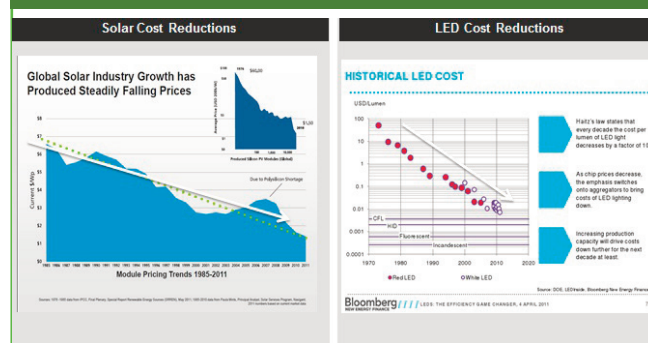
Figure 3: Chinese Solar PV Price Projections



Source: Greentechmedia.

the cost of roughly US\$150 per household – for “real” lighting levels. Spread these costs over 10 years, and an invest-

Figure 4: LED and Solar Cost Reductions



Source: Bloomberg New Energy Finance.

Source of Fuel	Generation Cost per kWh (Rs.)	Transmission Infrastructure Cost Per Km for a load of 100 kW (Rs.)	Other Maintenance costs/distribution infrastructure etc per kWh (Rs.)	Total Cost of Generation per kWh @ 1 Km (Rs.)	Total Cost of Generation per kWh 5 Km from Grid/33KVA line (Rs.)	Total Cost of Generation per kWh at 10 Km from Grid/33KVA (Rs.)	Total Cost of Generation per kWh at 15 Km from Grid/33KVA (Rs.)	Life of the Unit
Coal	4.50	1.00	0.50	6.00	10.00	15.50	20.00	30 years
Micro Hydro	4.50	-	0.30	4.80	4.80	4.80	4.80	25 years
Bio-mass	5.00	-	0.50	5.50	5.50	5.50	5.50	15 years
Wind-Solar Hybrid	12.00	-	0.30	12.30	12.30	12.30	12.30	25 years
Solar PV	7.50	-	0.20	7.70	7.70	7.70	7.70	50 years

- For remote villages, line costs alone exceed solar PV costs

Once the additional cost of grid extension is included (in the form of transmission and distribution line construction), decentralized clean energy becomes the more cost-effective means of delivering energy for off-grid populations. In India, where a mere 10 km from the grid, distributed solar is cheaper than extending transmission lines from a coal-fired power plant at today's prices. Given these economics, the decentralized approach will be far cheaper than a business-

as-usual approach that will still leave billions in the dark. For example, if 250 million households bought a 1.5-watt solar desk lamp that charges a mobile phone, it would cost roughly US\$4 billion. It would cost US\$38 billion to displace the use of kerosene with 10 watts of power in the form of a solar home system – at

ment of only US\$0.4–4 billion per year (at most) is needed to eliminate the need for kerosene. This range is roughly 1% of the cost of rural electrification, according to the IEA.

Of course, energy needs extend far beyond lighting. A rice husking mill or similar agro-processing equipment or shared refrigeration facilities may require a minimum of 3kW of power per village of 100 households, or 30W per household. Micro-energy investments can be effectively used as building blocks to move rural populations up a revamped energy ladder. At higher rural income levels, a US\$400 per household budget could secure 30 watts to power a TV, radio, and lights. The

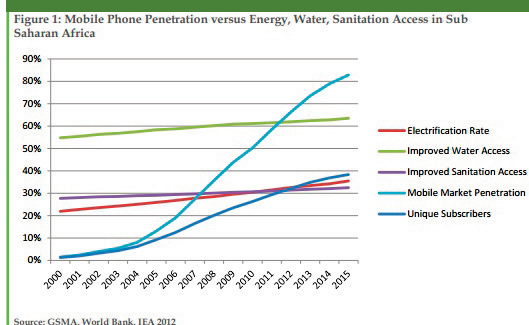
requirements could be even lower, as the Nepal micro-hydropower program has shown,¹⁰ particularly if battery storage can be avoided. Scaling up such 30–50W/household systems would cost US\$100 billion over the same time – or US\$10 billion per year. More importantly, they can be added incrementally, which helps avert over investment in power generation which can lock in “too big to fail” investments, such as Tata Mundra. This approach avoids the need for regulators to raise rates to recoup sunk costs. It also avoids the pitfalls of large-scale infrastructure price tags that are inducements to corruption, especially in countries with a “democratic deficit.”

Mobile phones push community power

While the economics of distributed clean energy are attractive, it's imperative to have proven business models for deploying this model at scale. Luckily, changing energy economics are coinciding with rising mobile phone penetration in rural areas, to create the infrastructure backbone for a radically different vision of rural electrification and micro-energy service delivery. Today, three out of every four new mobile phone subscribers are in the developing world and 411 million people worldwide have access to a mobile phone network but no connection to the electricity grid.¹¹ The dramatic increase in mobile phone users in rural parts of the developing world led to the construction of 639,000 off grid “base stations” by 2012.

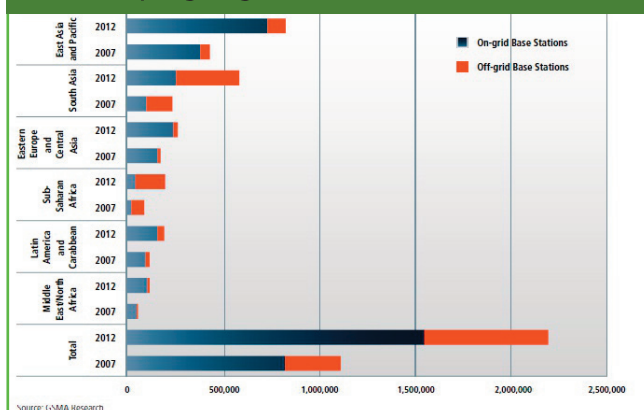
These base stations have traditionally been powered by diesel generators reliant on increasingly costly and unstably priced diesel. As a result, mobile phone providers are seeking stable, reliable, and less costly renewable energy alternatives. These base stations could provide a key to unleashing “community power” because, if they are built with excess capacity, electricity can then be sold to local communities via mini-grids, transportable batteries, or by directly charging applications on-site.

Figure 5: Mobile Phone Penetration Versus Energy, Water, Sanitation Access in Sub-Saharan Africa



Source: GSMA, 2013.

Figure 6: Growth in base stations in developing regions, 2007–2012



Source: GSM, 2010.

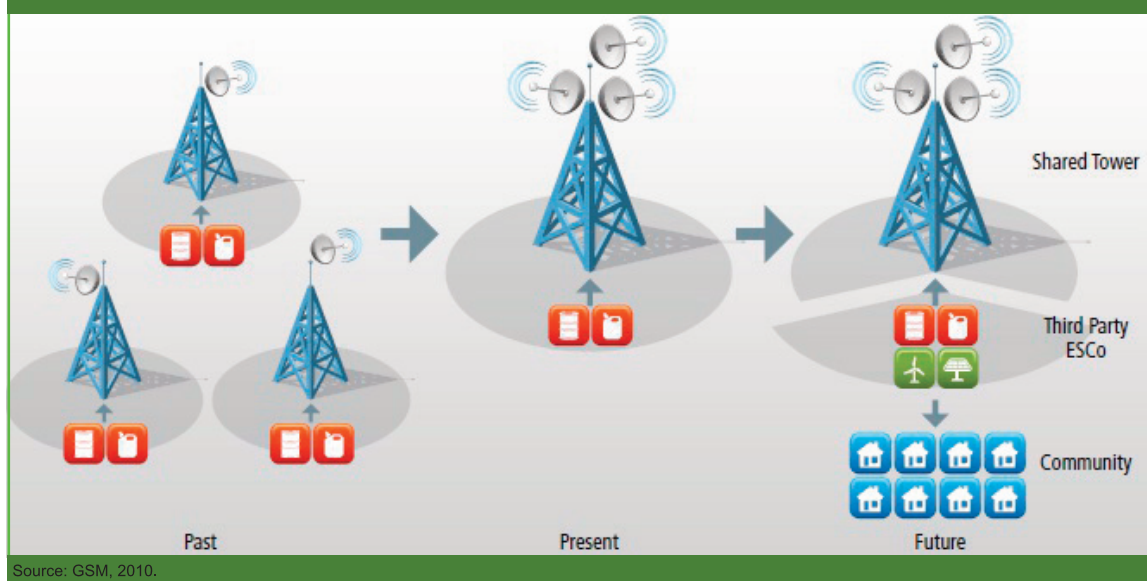
According to this model, cell phone operators represent the “anchor” or primary demand for services and a stable revenue stream; third-party entrepreneurs own and operate the renewable energy plants, and local communities receive electricity and provide revenue for the entrepreneur. In essence, this model obviates the need for centralized grid infrastructure by piggybacking on the most successful leapfrog technology to date – mobile phones. The mobile industry association (GSMA) says there is potential for 200,000 community power projects capable of providing electricity to 120 million people worldwide. Already, entrepreneurs are busy demonstrating the viability of this model in rural India.¹²

10. See: <http://microhydropower.net/download/mhpcosts.pdf>.

11. Green Power for Mobile: Sustainable Energy and Water Access through M2M connectivity, 2013.

12. See: www.omcpower.com.

Figure 7: Evolution of Telecoms Infrastructure Business Models



Radical affordability

The most exciting aspect of this model is that other services can piggyback on the distributed-electricity infrastructure. Already companies are pioneering models to deliver distributed Wi-Fi services as well as electric transportation.

At the same time that off-grid electricity infrastructure is established, social entrepreneurs are creating financial innovations capable of overcoming a stifling lack of access to capital. These innovations are enabling entrepreneurs to reach deeper into the economic strata than have traditional financial institutions. Just as third party ownership has unlocked the residential solar market in the US, financial innovations are now opening up clean energy to the rural masses. The most exciting innovations include machine-to-machine (M2M) technology to enable “pay-as-you-go” financing options and crowdfunding. They are providing financial inclusion that will help unlock clean energy for the “bottom of the pyramid” (BOP), or the masses of low-income people.

M2M technology allows customers to “pay as they go” using “mobile money” –money loaded onto cell phones which the

people can use to pay for services such as clean energy. Mobile money is catalytic because it provides payment flexibility and built-in financing. The technology is still nascent, but already M-Pesa in Kenya enables over 15 million people to access the financial system and accounts for US\$12.3 billion in transactions.¹³ An exciting example of this model in practice is Simpa Networks, which uses mobile money to enable solar home system financing.

Crowdfunding, on the other hand, is a potentially disruptive financial innovation that unlocks and aggregates small amounts of capital via Web-based platforms. SunFunder currently leverages this model to finance solar lanterns in the developing world, while Solar Mosaic was able to raise US\$313,000 in its first 24 hours of operation to finance solar projects in the United States.

These financial innovations enable customers to overcome hurdles such as cash flow mismatches, a lack of land title, or insufficient collateral, that leave large portions of the unelectrified market outside the formal financial sector. Ultimately, overcoming these financing hurdles empowers consumers at the BOP to shift away from the use of dangerous and expensive fuel based lighting such as kerosene.

13. Green Power for Mobile: Sustainable Energy and Water Access through M2M connectivity, 2013.

Rethinking and redesigning rural distribution

The first application of electricity for the poor is lighting, quickly followed these days by mobile phone charging. With the advent of white LED lighting, the light supplied by 100W of incandescent bulbs can be met with just 5W of well-designed LED lighting. A phone charger takes similar power, meaning the power per household for basic services drops by 90%. This leads to an equivalent drop in the current in the “poles and wires” that connect households in conventional grids, and therefore the potential to use much thinner and cheaper wiring. Combined with smaller poles and longer spans, or locally dug underground trenches, the cost per household for reticulated wiring can be vastly reduced via “Skinny Grids”: thin cable designs not previously imagined.

Combined with innovations like 1–2 kV low cost, low power transformers such as those used in Andhi Khola, Nepal, or those promoted by www.microformer.org, Skinny Grids could reach households 5–10km from power sources cost effectively. In some countries, over 95% of all households are within 5–10km of an off grid telecom tower or the edge of the grid, and these towers are often grossly under-loaded compared to the power demand for the tower (e.g., 3kW load compared to 15kW installed capacity). Therefore, the power generation to connect 10–20W of load per household may already exist for the majority of the off-grid market, and the only investment needed is US\$1/meter of Skinny Grid connections. Such minigrids can quickly be converted to solar and other renewable sources. Peak load issues on the grid can also be reduced by 20–50% in emerging countries by re-lamping incandescent and fluorescent lamps with LED lamps, at cost much lower than building new peak power generation, and at a cost of megawatts of energy comparable to current prices paid to independent power producers. Energy efficiency, combined with distributed power and new “high voltage”, low power transformers, can revolutionize rural electrification.

Conclusion: Aligning public policy with a distributed future

Despite the clear opportunity decentralized clean energy provides, development institutions and their aid continues to support a failed “business as usual” approach. For example, a 2011 study by Oil Change International found that – of all fossil fuel projects financed by the World Bank – none provided energy access for the poor.¹⁴ Of these projects, the only one that achieved this goal was a US\$1.25 million investment in small scale, decentralized biomass gasifiers that benefited 2,500 people in India. In contrast, the solar crowdfunding start up organization, SunFunder, facilitated US\$414,000 over nine projects to benefit 105,000 people since 2012. That means SunFunder provides energy access at a level ten times higher than the World Bank using a fraction of the capital. We offer policy-makers the following lessons to incorporate into lending decisions, in order to bring about an investment shift that will unlock distributed clean energy infrastructure:

Lesson #1: We are using the wrong yardsticks. The use of a price per kilowatt metric to determine where and when the poor receive energy should be supplemented by other metrics, including gigawatts of supply and kilometers of transmission and distribution. Moreover, policy-makers should judge investments on energy services actually delivered (not just supplied) to the grid and households receiving power, among other things.

Lesson #2: Small is fast. At best, large-scale power plants take years to construct. Worse, they can be constructed without the accompanying transmission and distribution infrastructure, meaning the poor never receive the power. In contrast, small-scale systems can be deployed in a matter of months.

Lesson #3: The money is there; it is not being spent wisely. Capital is not being allocated properly. In 2010, only 20% of the US\$409 billion in developing countries’ fossil fuel subsidies reached the lowest income group.

14. See: <http://bit.ly/1esSHVS>.

Meanwhile, a tenth of the amount spent on subsidies (US\$400 million) is needed annually to provide lighting services via clean energy.

Lesson #4: Ring-fenced public capital is required. Given the dearth of capital available to this sector, and its overwhelming development impact, public institutions must step in to provide targeted support.

Lesson #5: Energy efficiency leads to skinnier grids that cost less. LED lighting has dramatically reduced the amount of power households require to meet their basic needs. Rural electrification design needs an overhaul to combine innovative transformers and Skinny Grids (of far thinner conductors) to service vast numbers of households.

Lesson #6: Small is bankable. Small-scale finance (e.g., Crowdfunders, such as SunFunder) is catalytic and vital because it addresses a profound market failure. However, traditional financial institutions must urgently increase support for these smaller projects with impressive development impact.

Projects funded by public money flowing through vehicles such as a “fund of funds” would need to be tailored to reach small-scale projects. Crowdfunding platforms, as well as local financial institutions, will be critical to aggregate small loans in order to tap into larger financial flows available from such a fund. Specific products could be funds that match dollar-for-dollar money raised from the crowd, or loan guarantees that could help unleash capital for local entrepreneurs. They could also replicate the World Bank's successful operation in Bangladesh – namely, buying long-term solar home system loans from local banks, thereby creating liquidity in the market and shifting the risk from the local bank to the multilateral institution. Ultimately, this marries the best of both worlds – the nimble ability of crowdfunders to support small-scale projects that have an immediate impact on the lives of the poor with the larger pools of capital that the development institutions can tap into, without forcing them to directly engage in small-scale projects.

Ultimately, we'll need to bring the larger pools of capital from development institutions and institutional investors to bear on this problem. Certainly, if there's anything we know for sure it's that pouring more money into “business as usual” ensures “failure as usual”.

Conclusion: The local energy economy revolution

It is unconscionable that biased spending priorities leave hundreds of millions of rural poor to spend huge portions of their daily income on dirty kerosene and diesel instead of cheaper, cleaner, and safer energy sources. Meanwhile, they wait for the fossil fueled transmission grid to arrive – a grid that hasn't come for decades, and won't come for decades more.

How many babies in poor households need to be born in the dark? How many underserved children should lose their schooling opportunity to darkness because someday the coal powered grid will arrive? More importantly, how many of those waiting for grid power will be displaced, or have their land, air, and water heavily polluted in the rush to build coal plants or expand coal mines?

Over the next decade, mobile phone penetration, community power, and radical affordability will drive a local energy economy revolution. The resulting radical “democratization” of energy will hold profound implications for societies around the world. First and foremost, the creation of local energy economies avoids the tragic legacy of displacement and disenfranchisement associated with large-scale, centralized energy projects. At the same time, local energy economies have the cascading development effect of improving health, education, productivity, and income.¹⁵ Ultimately, this revolution will do what traditional efforts have thus far failed to do – bring billions around the world from darkness to light.

In the meantime, villages across the world wait for the grid to inch its way closer, and every day they pay an

15. Data compiled by the World Bank's Lighting Africa Initiative shows that solar lighting has increased revenues for rural enterprises by as much as 60%, as entrepreneurs are able to increase the number of working hours (Lighting Africa, 2010).

“opportunity cost”: the opportunity for a child to study, the opportunity for a vendor to increase sales, the opportunity for a village to escape darkness. It’s time that policy-makers wake up to the opportunity that will end this 19th century

approach to rural energy delivery and provide distributed power, entrepreneurial solutions, and bottom-up electrification.

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Achieving “Energy for All” in India

Key Principles for overcoming policy barriers to the provision of inclusive access to clean, affordable and sustainable energy

Srinivas Krishnaswamy and Sunita Dubey

Executive summary

This chapter analyses India's current energy policy framework (which is typical of many other developing economies) and proposes solutions. These include guiding principles, an action framework and governance and institutional mechanisms that could ensure that every citizen of India has reliable access to clean, affordable energy, while setting the country on a pathway that is climate resilient, gender sensitive and sustainable. The solutions are based on models that have worked “on the ground” – a combination of decentralised renewable energy systems designed to interact and co-exist with the electricity grid infrastructure, while ensuring that energy access goes beyond lighting.

Access to “clean, affordable and reliable energy” continues to remain a problem in many developing countries. In India, close to 70 percent of households continue to depend on traditional biomass to meet their cooking and heating requirements, and 33 percent of households continue to depend on kerosene to meet their lighting requirements. This despite that fact that India's policy makers have recognised energy access as a priority for development. There have been major, well funded programs specifically aimed at addressing energy access.

In the last decade, India's electricity generation capacity has risen by nearly 80,000 MW. One of the key justifications for such a large increase in capacity has been to ensure “access to energy for all” and to address the huge deficit in electricity supply. But only a small percentage of this additional capacity is accessible to vulnerable and rural communities.

One of the main reasons that India has not met its energy access targets is the country's top down development planning, which has led to failures of service delivery to poor communities. Globally and domestically, the dominant development model is focused on macroeconomic growth, which is measured by gross domestic product (GDP). India aims to achieve double-digit GDP growth rates for the next 20 years. This has resulted in a focus on investment in large scale energy infrastructure to fuel growth (i.e., large-scale coal, large hydro, transmission grid and pipelines). Much of the energy infrastructure in developing countries is designed to expand domestic urban centers and energy exports to other countries, rather than for local use.

One of the most significant problems is the continued reliance on dirty coal-fired plants, which dominate the Indian power sector. Around 400 new coal-fired power plants, totaling close to an additional 350,000 MW of electricity generation capacity, are in advanced stages of approval and commissioning. Direct effects from the construction and operation of coal-fired plants include emissions of pollutants and hazardous chemicals, contamination of local waterways and degradation of land used for storing the by-product of burned coal, known as fly ash. Adding nearly 400 new coal-fired power plants will have huge environmental effects.

Regrettably, socio-economic, health and environmental impacts are not factored into the cost of coal, and more emphasis is placed on the potential amount of electricity generated by these power plants. Even though an environmental impact assessment is part of the approval process, it is just used as a step to obtaining environmental clearance.

This chapter provides a set of guiding principles that energy and development planners should factor into policy frameworks. It also outlines ways to ensure that the barriers to widespread adoption of decentralized renewable energy are removed. It explains the link between access to clean energy and overall development and that universal access could lead to a substantial rise in the Human Development Index (HDI) of India.

An energy secure future for India will not only involve access to energy resources but also require dealing with increasingly pressing environmental and ecological issues. Tackling these issues needs input from all stakeholders.

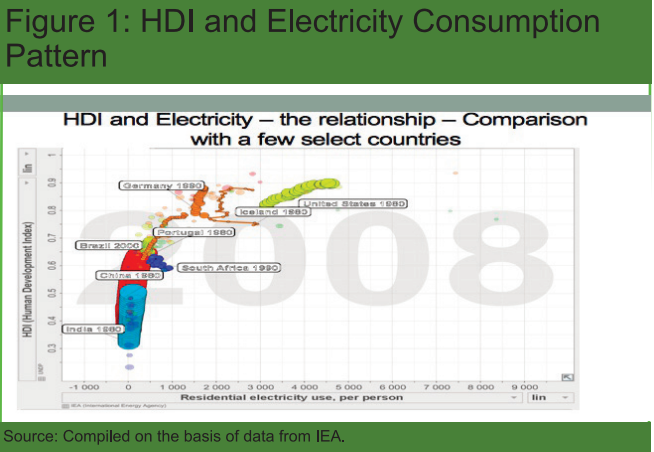
I. Background

The demand for “inclusive and sustainable growth” is not new; it has been part of the political and social landscape for decades. The current approach to development, however, has emphasized GDP growth, despite the fact that in many countries GDP growth has been accompanied by a rise in poverty and income inequality.

Traditionally, access to energy services has been seen as a way to lift people out of extreme poverty. But close to 1.6 billion people are faced with energy poverty in the world. In India, 33 percent of the population still lacks access to electricity, and close to 75 percent of households are dependent on traditional biomass to meet their basic energy requirements. The current efforts to boost GDP and install large scale centralised infrastructure have failed to make meaningful progress toward providing clean, affordable and sustainable access to energy services for all.

Although there is no inherent relationship, there is a broad correlation between the Human Development Index (HDI)¹ and per capita energy consumption across countries (see

Figure 1). This correlation does not mean that higher energy consumption necessarily adds to human development, but rather that the availability of energy services is an important ingredient for advancing many aspects of human development. For example, there is an entire range of countries,



from Hong Kong to Germany to Ireland, that have HDI levels above 0.9, but whose energy consumption only ranges from around 2.5 to 4 ton of oil equivalent (toe) per capita. Clearly, it is possible to be “developed” without consuming energy at the level of the United States or Canada.

India is a typical country where a low HDI is also characterised by extremely low per capita energy consumption. In 2011, the per capita energy consumption of India was a mere 684 kWh, while China recorded a per capita energy consumption of 3,298 kWh, Brazil 2,438 kWh, South Africa 4,694 kWh, Germany 7,081 kWh and the USA 13,246 kWh.² India’s 2011 census shows that nearly 43.2 percent of India’s rural households continue to depend on kerosene for lighting, while 0.5 percent of its population (nearly 897,760 households) is in perpetual darkness.

The table on the following page summarises sources of lighting in India, based on census data from 2011.

1. HDI is a way of measuring development by combining indicators of life expectancy, educational attainment and income into a composite human development index. HDI offers a single statistic as a frame of reference for both social and economic development.

2. See: <http://data.worldbank.org/indicator/EG.USE.ELEC.KH.PC>

Table 1: Sources of Lighting: All India³

	Absolute number			% R U		
	Total	Rural	Urban	T	R	U
Total	246,692,667	167,826,730	78,865,937	100.0	100.0	100.0
Electricity	165,897,294	92,808,038	73,089,256	67.2	55.3	92.7
Kerosene	77,545,034	72,435,303	5,109,731	31.4	43.2	6.5
Solar	1,086,893	916,203	170,690	0.4	0.5	0.2
Other oil	505,571	407,919	97,652	0.2	0.2	0.1
Any other	493,291	361,507	131,784	0.2	0.2	0.2
No lighting	1,164,584	897,760	266,824	0.5	0.5	0.3

Source: Census 2011, Government of India.

Table 1 shows that almost 33 percent of Indian households do not have access to electricity. The penetration of solar and other renewable energy is extremely low, a mere 0.4 percent of households, as against 31.4 percent of households dependent on kerosene for lighting. The great majority of unelectrified households are in rural India; the urban electrification rate is approximately 92 percent.

What do these patterns imply? It is obvious that a major challenge for India is ensuring that its energy-deprived masses get access to clean and affordable energy sources, including electricity, liquefied petroleum gas (LPG) for cooking, and access to transport (preferably public transport). Affordability of cleaner fuels is important, but if modern fuel distribution systems do not reach rural areas, even the households with sufficient income cannot purchase fuel. Thus, efforts to bring improved energy services to the poor must enhance the energy supply and set

up programs and policies relevant to the existing sociocultural and socio-economic context.

Access to electricity for lighting purposes is a problem in India, but the energy sources for cooking and heating present an even more dismal picture.

Table 2 shows that 76.2 percent of India's rural households continue to depend on "traditional biomass" for

meeting their cooking and heating requirements, while 70.30 percent of all households are dependent on traditional biomass.

Table 2: Source of cooking and heating in India

	Absolute number			% R U		
	Total	Rural	Urban	T	R	U
Firewood	120,834,388	104,963,972	15,870,416	49.0	62.5	20.1
Crop residue	21,836,915	20,696,938	1,139,977	8.9	12.3	1.4
Cow dung cake	19,609,328	18,252,466	1,356,862	7.9	10.9	1.7
Coal, lignite, charcoal	3,577,035	1,298,968	2,278,067	1.4	0.8	2.9
Kerosene	7,164,589	1,229,476	5,935,113	2.9	0.7	7.5
Liquefied Petroleum Gas/ piped natural gas	70,422,883	19,137,351	51,285,532	28.5	11.4	65.0
Electricity	235,527	118,030	117,497	0.1	0.1	0.1
Bio gas	1,018,978	694,384	324,594	0.4	0.4	0.4
Any other	1,196,059	1,040,538	155,521	0.5	0.6	0.2
No cooking	796,965	394,607	402,358	0.3	0.2	0.5

Source: Census of India 2011.

In urban centers, electricity access can be synonymous with energy access. It not only meets lighting needs but also caters to a variety of household energy needs (for example, appliances). In rural areas, however, "electricity access" generally refers to the capacity to meet lighting requirements.

Policy makers cite two justifications for such a large number of unelectrified households in India: a shortfall in demand

3. See: http://www.censusindia.gov.in/2011census/hlo/hlo_highlights.html

for electricity and the lack of funds to provide electricity infrastructure in rural areas. While there is some truth in this, the political will to ensure universal household access is crucial, as noted in a 2010 comparative study on rural electrification in India, China, Brazil and South Africa, conducted by the International Energy Agency (IEA).

The IEA report states that “social fairness should be the guiding principle” in designing the stages of electrification to ensure universal household electricity and energy access. Unfortunately, this has not been factored into the Indian policy framework for energy access.

In the past few years, there has been significant increase in electricity generation capacity from 74,420 MW⁴ in 2002 to 153,487 MW⁵ in 2013. Over the same period, the supply of electricity reached only 6.4 percent additional rural households, however, despite the 100 percent increase in electricity generation capacity.

Table 3: Electricity generation from thermal power plants and its relation to energy access

	2002 (MW)	2013 (MW)
Installed Capacity of Thermal Power Plants	74,420 ⁶	153,487 ⁷
Total Unelectrified Households	45% ⁸	33% ⁹
Unelectrified Rural Households	51% ¹⁰	44.6% ¹¹

4. Sources of Electricity Supply, 1985–2009, Planning Commission, Government of India.

5. *Ibid.*

6. *Ibid.*

7. “Power Sector at a Glance” – Ministry of Power, http://powermin.nic.in/indian_electricity_scenario/introduction.htm.

8. Source: Rural Electrification Programme, Ministry of Power, Government of India.

9. Source: Census 2011

10. Source: Census 2001.

11. Source: Central Electricity Authority, rural electrification figures, 2013 and Census 2011.

II. Current gaps in policy implementation: Why energy access is still an issue in India

The main issues in policy formulation for the energy sector are:

- a) Development planning in India has been driven from the top, which has led to service delivery failures. More attention should be paid to bottom-up and people-oriented energy planning. As noted above, the dominant development model focuses on achieving economic growth. This results in investments in large-scale energy infrastructure to provide energy for growth (i.e. large-scale coal, large hydro, transmission grid and pipelines). Also, much of the infrastructure for energy in developing countries is for export of energy to other countries, or to urban centers, and not for local use. The theory that increases in electricity generation would translate into “electricity to the electricity-starved population” has consistently been proved wrong in India and in many other developing countries. The bulk of increase in the electricity generation actually is used to meet increasing an increasing demand from urban and industrial users.
- b) Tackling this huge disparity between inclusive development and energy growth requires a bottom-up approach to planning, including mainstreaming gender issues into energy policies. Most energy policy frameworks ignore the fact that limited access to energy has a disproportionate effect on women, especially in rural areas.
- c) All development planning in India is compartmentalized, with issues addressed in different “silos” by different ministries and departments with little or no coordination. For instance, there is no link made between access to reliable and affordable electricity and income generation - for women's groups, local micro-entrepreneurs and farmers (especially those who grow cash crops and horticultural produce). Also, there are few links drawn between clean energy access, health and education.

- d)** For rural India, policy makers are focused on electricity rather than energy services and development. Therefore, any policy on energy access should cover all heating and lighting requirements of the poor as well as requirements relating to livelihoods, micro enterprises and transport. Low carbon rural transport can contribute to reducing poverty by creating jobs and expanding market access. Heating requirements should go beyond cooking and look at related agricultural cottage industries, amongst other local activities.
- e)** Access to energy services should address the key issues of: (a) universal access; (b) equity (in terms of bridging the gap between urban and rural availability of energy supply and access to services); (c) reliability; (d) affordability (pricing and subsidies); and (e) appropriateness.
- f)** In considering the energy needs of the poor and marginalized, policy makers should address the question of subsidies. In the current system, the rich and urban consumers benefit from hidden as well as overt subsidies of fossil fuel based energy sources, such as LPG and other petroleum products and centralized electricity generation systems.
- g)** Currently, there is a large funding gap in the provision of energy access for the poor, which is not being seriously addressed by existing financial mechanisms and institutions.
- h)** In the above context, current Indian policy is geared towards financing fossil fuel-based projects. Resolving many of the problems in the energy sector will require new technologies and practices. These need to include more efficient “conversion” and the development of low pollution and low greenhouse gas emitting technologies, especially renewable energy technologies. Improved environmental practices in the energy sector, as well as improvements in land use and forestry, are necessary.
- i)** Some of the main obstacles to decentralized renewable energy systems in India, which result in very low-level penetration of such projects, are:
- High investment requirements: These are particularly relevant to decentralized renewable energy systems, as they require higher storage capacity (batteries).
 - Subsidies for decentralized renewable energy systems competing with fossil fuel: If the subsidy for kerosene and diesel for rural household electrification and irrigation pump sets were diverted to solar systems, it would significantly reduce the investment requirements at both the front and back of the energy supply chain.
 - Lack of linkage between decentralized renewable energy mini grids and central grids. In India, a major barrier to the expansion of renewable energy is the lack of connectivity and links between decentralized renewable energy mini grids and central grids. In many cases, grid extensions to a particular location do not reach decentralized renewable systems. The two systems must be linked so that the potential for decentralized renewable energy systems can be realized. This underutilization also creates major risks for private investors in renewable energy systems.
 - Higher energy costs for rural consumers: It is problematic that the cost of energy to end-use consumers of renewable energy systems is higher than for urban consumers, who are connected to the domestic grid. The cost of electricity to typical rural consumers should be compared with the cost of kerosene. Therefore, to expand renewable energy systems, subsidies must be directed away from fossil fuel sources towards renewable energy sources. This would place the cost of providing 24-hour energy services to rural communities on par with or below the cost of urban domestic provision.

- Willingness and ability of rural households to pay, primarily because energy demands are currently linked only to lighting needs rather than employment generation and better livelihoods. Studies have highlighted that rural consumers are willing to pay for high quality energy services.

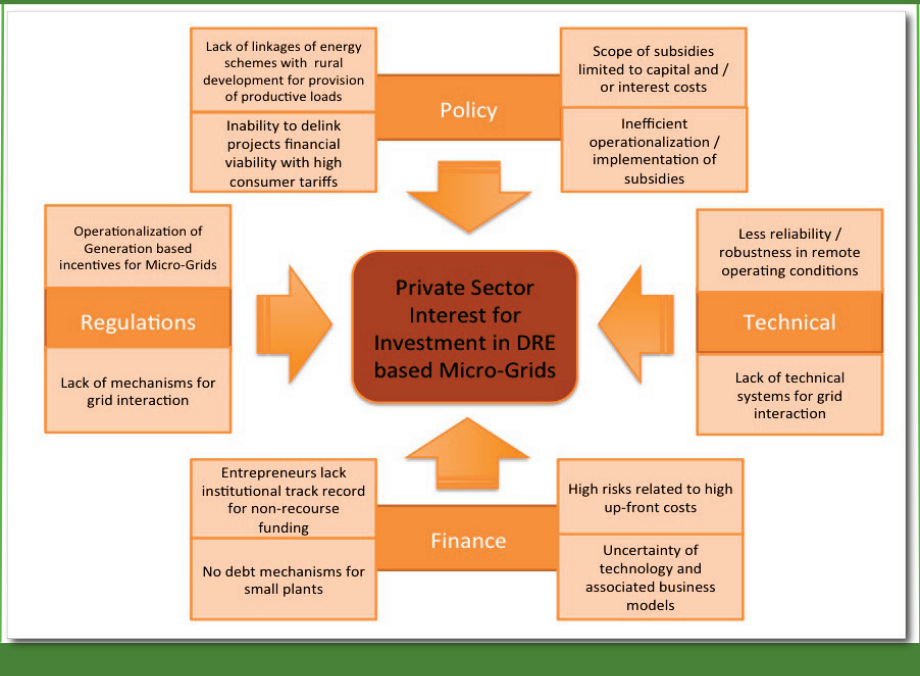
There are two critical questions that remain to be answered: When will these technologies and practices be deployed? Who will take the political risk to change the status quo? The flow chart below summarizes the main challenges the Indian energy sector faces in ensuring universal energy access.

III. Guiding principles and recommendations for energy access in India

There is an urgent need to redefine priorities for the energy sector, particularly to ensure clean, affordable, sustainable energy for all. Key questions are:

- For what/whom is the infrastructure required?
- On the basis of the above, what kind of energy infrastructure would be most suitable?
- What are the costs and benefits of such proposed infrastructure, taking into account not only the economics of electricity generation, but also external costs (e.g. pollution, health, climate)?
- Does the desired infrastructure represent the best available technology?
- Does it provide the greatest potential in terms of environmental and social sustainability? If not, what are the alternatives?

Table 4: Private sector interest in decentralized renewable energy (DRE)

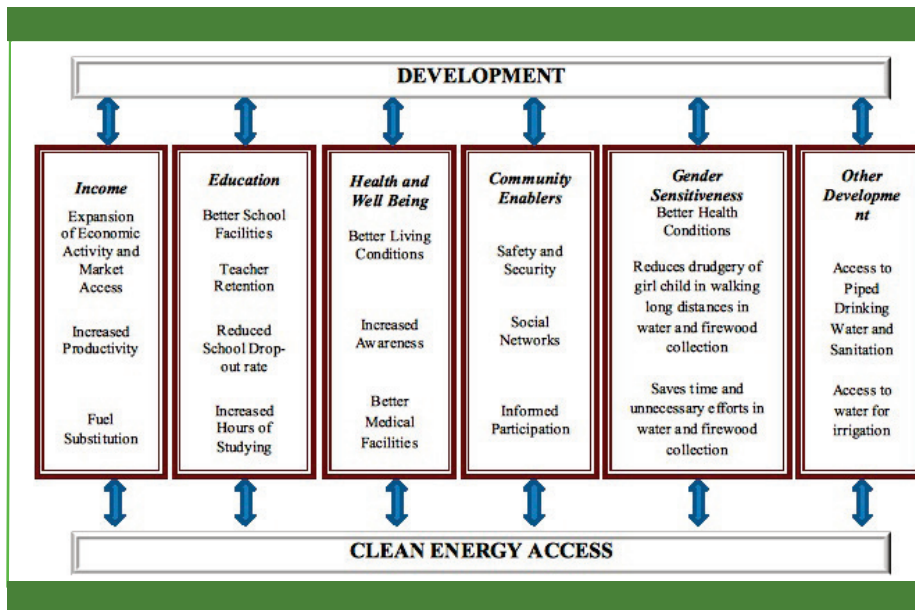


Technologies must be compared on a life cycle basis, taking into consideration technical performance, economics, socio-environmental impacts, availability of manufacturing and maintenance capability within each individual country and institutional issues.

When evaluating how technologies can help with the provision of clean, affordable and sustainable energy for all, the following guiding principles should be considered:

- a) Implement holistic development planning rather than an approach to development where every department and ministry is concerned only with its narrow mandate. For example, there is a very clear link between energy access and development. This cuts across the sectors of health, education and access to water and sanitation. It also has a major bearing on income generation, gender and livelihood enhancement.

The diagram below provides a snapshot of the links between energy access and development. Even a small increase in electricity consumption can lead to a marked improvement in the quality of life for poor and vulnerable people. The small increase in electricity consumption would primarily meet



lighting needs and cooking and heating requirements, but could also be linked to overall growth and development.

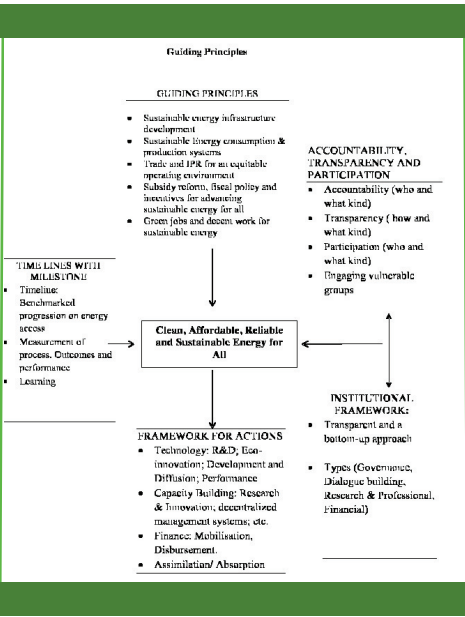
- b) Introduce a transparent and consultative institutional and governance framework that adopts a bottom-up approach.
- c) Conduct a cost-benefit analysis with a full audit of energy requirements and potential. This should

rigorously factor in all risks, including social and environmental costs, displacement of communities and effects on the health and livelihood of communities, while also looking at alternative, cleaner options for electricity generation.

- d) Particularly for a country such as India, energy efficiency, conservation and reducing the percentage of energy transmission loss need to be prioritized over adding electricity generation capacity. The only way to balance economic growth with domestic demand without endangering the planet is to gradually raise the energy efficiency of all domestic and commercial energy uses.
- e) In the design of financial mechanisms and institutional delivery systems, the above recommendations need to be the guiding principles. This would ensure the removal of current financial barriers to solutions for clean, affordable and sustainable energy access.
- f) India already has mature clean energy technologies and is considered a leader in this field. Most of these products find their way to the export market, however, with very little uptake in the domestic market. To ensure that renewable and clean energy product manufacturers should also target the domestic market, government policies must stimulate domestic production and create a favorable investment climate. Efficient implementation of policies is

also required, including penalizing producers for noncompliance. For instance, India has renewable purchase obligations that make it mandatory for utilities to purchase a stipulated quantity of electricity from renewable energy sources. But there is no penalty for non-compliance with this obligation.

The diagram below provides a bird’s eye view of the guiding principles for an energy policy framework for India.



Conclusion

In a country such as India, energy access is linked to overall human development, and there is a direct correlation between energy consumption and a higher ranking in the HDI. New policy guidelines are needed to establish new institutions and mechanisms and to implement a program on universal rural energy access.

A range of solutions are required to address universal energy access while placing the country on a path that is sustainable, climate resilient and gender-sensitive. From a rural energy access perspective, it is very important to meet the holistic energy needs of communities, and this should go beyond mere lighting. Such comprehensive energy access targets can only be met by a combination of solutions in which decentralized renewable energy plays a dominant role. Renewable energy cannot be used as a fig leaf in order to hide all polluting investments in the power sector, such as dirty coal.

Renewable energy should be seen as a key to achieving clean and affordable energy access, especially where grid connectivity is lacking. For example, many households rely on biomass and inefficient chulahs (open stone stoves) for cooking, which has negative impacts on women’s health. The government needs to make the provision of clean cookstoves a national priority. This will not only improve women’s health, but will reduce black carbon emissions, which are another major cause of climate change.

Improving energy services to the poor is not just about supply. It is also about India introducing policies that address the associated economic, financial and sociocultural problems.

Public–Private Partnerships in Indonesia

Policy and Public Responses

Siti Khoirun Ni'mah ("Nikmah")

Executive Summary

To address gaps in its infrastructure development, the government of Indonesia has sought to enter into arrangements for long-term financing through various international fora such as the Group of 20 (G20), Asia Pacific Economic Cooperation (APEC), and the Association of Southeast Asian Nations (ASEAN). These efforts seek to implement Public–Private Partnerships (PPPs) and to consolidate national infrastructure financing to sustain connectivity across regions within Indonesia and between Indonesia and the rest of the world. At the same time, the government of Indonesia is sending a message to the international community that Indonesia is prepared to launch an improved generation of PPPs.

This paper examines three key questions. First, what is the nature of the PPP policies related to infrastructure development in Indonesia? Second, how are affected communities responding to PPP projects? Third, what opportunities exist for renewable energy infrastructure development using PPP schemes?

The first question refers to a) a series of policies, laws, presidential regulations, and ministerial regulations across various sectors; b) the establishment of relevant institutions, such as the Indonesian Infrastructure Guarantee Fund (IIGF); and c) the budget allocation for guarantees and land acquisition. The second question explores communities'

reaction to the pilot PPP project, the Central Java Coal-fired Power Plant (CJPP) and its potential effects. People feared this project would lead to relocation from their homes and land. With regard to the third question, national planning documents describe the projected increases in Indonesia's reliance on coal and natural gas and significant declines in the share of renewable energy sources in the country's overall energy mix by 2025. This does not bode well for the country's future. In formulating country-wide policies or in identifying and designing projects, it is crucial to engage the citizenry. If the government aims for sustainable infrastructure development, the people must be involved as partners in the entire process, from planning to implementation and monitoring. This is because the citizenry lives with the outcomes of the development process.

1. Introduction

The provision of infrastructure services to its citizenry is one of the key functions of the state. Indeed, the capacity to ensure service delivery should be an indicator of a robust state. For the state, a positive development strategy involves strengthening its capacity to ensure infrastructure development. State building is therefore inseparable from infrastructure development.¹

1. Makmur Keliat, Asra Virgianita and Fina Astriana. 2013. "Pembangunan Infrastruktur di Indonesia dan Peran G20" [Infrastructure Development in Indonesia and the Role of G20], INFID and University of Indonesia. See Ghani *et al.*, 2006.

Indonesia is actively promoting infrastructure development through various international fora such as the Group of 20 (G20), the Association of Southeast Asian Nations (ASEAN), and the Asia Pacific Economic Cooperation (APEC). Promoting long-term financing for investment, including for infrastructure development, continues to be a high priority for the G20. Meanwhile, the ASEAN Infrastructure Fund was established with initial support from ASEAN member countries and complementary support from the Asian Development Bank accompanied by the list of projects set out in the Master Plan on ASEAN Connectivity. In October 2013, the APEC meeting in Bali drew up a Multi-Year Plan on Infrastructure Development and Investment for which Indonesia will host a center with an expert panel to develop Public-Private Partnerships (PPPs). Launching PPPs will involve consolidating the financing for national infrastructure in order to sustain connectivity across Indonesia and between Indonesia and the rest of the world. Through launching a new generation of improved PPPs, Indonesia wants to send a message to the international community that the country has all of the prerequisites (institutional, legal, and financial) to expedite infrastructure development.

Numerous studies and assessments of PPPs in Indonesia have been conducted over the past decade. Research carried out by Strategic Asia, for example, examines the potential of PPPs to accelerate infrastructure development in Indonesia.² The study specifically probes the challenges of developing PPPs, given the central government's capacity and its relations with local governments. Another study conducted by the Organization for Economic Cooperation and Development

"If the government aims for sustainable infrastructure development, the people must be involved as partners in the entire process, from planning to implementation and monitoring"

2. Strategic Asia. 2012. "PPP (Public-Private Partnerships) in Indonesia: Opportunity from the Economic Master Plan".

(OECD) explores PPP governance, mainly in terms of policy, process and structure, while highlighting the need for institutional capacity.³

The International NGO Forum on Indonesian Development (INFID), in cooperation with the University of Indonesia (UI), also reviewed infrastructure development in Indonesia and the role of the G20.⁴ We found that infrastructure development in Indonesia is slowed by five types of imbalance. First, there is a geographical imbalance. Infrastructure development is centered on Java and Sumatera, leaving other regions in Indonesia far behind, resulting in inequitable development. Second, there is an imbalance between economic growth and infrastructure development. That is, the rate of infrastructure development lags behind Indonesia's economic growth rate of 6% per year. Third, there is an imbalance in the governance of infrastructure. In principle, "infrastructure" is defined as "goods and services that to meet public demands"; however, there is a decade-long trend toward the management of infrastructure by private sector monopolies, which has not served the public interest. For instance, monopoly control of infrastructure development by private firms has made it difficult for citizens to participate or express their concerns or complaints; the role of the private sector in infrastructure development has nevertheless expanded, and public participation declined. Fourth, there is a budget imbalance. In the past decade, the budget allocation for infrastructure development has expanded, but it has never exceeded 2% of GDP. In terms of the proportion of government spending, the infrastructure budget accounts for an average of 10% of total annual expenditure. Finally, there is an imbalance in capacities for policy-making and implementation.⁵ That is, actual capacities fall short of what is required for effective governance of infrastructure.

All these imbalances increase the complexity of the infrastructure development process in Indonesia. Thus far, infrastructure-related policies have opted for mobilizing resources from outside the state budget by involving the private sector, through the establishment of PT Sarana Multi

3. OECD. 2012. "OECD Reviews of Regulatory Reform – INDONESIA: Public-Private Partnership Governance: Policy, process and structure".

4. Makmur Keliat *et al.*, *op. cit.*

5. Keliat *et al.*, 2013.

Infrastruktur (PT SMI) in 2009 and the Indonesian Infrastructure Guarantee Fund (IIGF) in which public funds offset private risks.⁶

Given the above context, this chapter examines three key questions. First, what is the nature of the policies and institutions governing PPP infrastructure development in Indonesia (e.g., the government's commitment to financing infrastructure; policies relating to whether or how to guarantee private sector risks). Second, what is the role and response of communities affected by the pilot PPP project, the Central Java Coal-fired Power Plant (CJPP)? And third, what opportunities exist for promoting renewable energy through infrastructure PPP schemes?

This chapter is divided into five sections. The first presents background information. This is followed by a section on government infrastructure development policies and commitments, including its commitment to providing infrastructure and its financing. It also explores the role of the private sector in infrastructure, including how the government provides guarantees to offset private risk (a feature of the Indonesian PPP) and the way in which the regulatory framework mitigates risks to society and the environment. Section three assesses the public's response to the first PPP project under the guarantee scheme. Section four focuses on the development of renewable energy under PPP schemes. The final section concludes with key points and recommendations.

2. PPP Policy in Indonesia

2.1 The Government of Indonesia's commitment to infrastructure development

The Master Plan on Accelerating and Expanding Economic Development in Indonesia (MP3EI) is the government's blueprint for developing the country's infrastructure and promoting economic growth through inter-regional connectivity. The MP3EI document, released in 2011, was formulated outside the regular annual and five-year development planning schemes. Only the private sector and

the government were involved in drawing up the document. It states that infrastructure development is necessary to fulfill Indonesia's ambition of attaining a per capita income between US\$ 14,250 and US\$ 15,500 and a GDP between US\$ 4.0 and US\$ 4.5 trillion by 2025. To this end, Indonesia will establish six economic corridors: Sumatera as the production center for natural resources and energy; Java as the industrial and service center; Kalimantan as the production center for mining and energy; Sulawesi (Celebes) as the agricultural and plantation center; Bali and Nusa Tenggara as the tourism hubs; and Papua and Maluku as the energy and food production centers. The master plan maps out Indonesia's infrastructure development agenda until 2025. Some 396 projects that spread across various regions are identified, which will require funding of approximately US\$ 400 billion.⁷

The MP3EI policy is the outcome of a series of efforts initiated by the government in the past few years. It began with the formation of the Committee for the Acceleration of Infrastructure Development in Indonesia (KPPI) in 1998, followed by the organization of infrastructure summits in 2005, 2006, and 2009 to harness support for infrastructure financing. But these efforts have yet to produce the desired levels of funding from the public and private sectors.

Civil society has criticized the MP3EI document for its heavy reliance on extractive industries. The strategic value of each corridor is primarily derived from mining – an extractive process which will deplete natural resources, cause environmental degradation, and expand poverty due to land acquisition and displacement. Importantly, these corridors only focus on implementation of large infrastructure ventures rather than the small or appropriate-scale infrastructure needed for people living in remote areas, such as Banten, West Java, where children have to cross collapsed bridges to get to school. Despite these criticisms, the government has remained steadfast in its belief that MP3EI will be Indonesia's remedy to the barriers to economic development.

6. Keliat *et al.*, 2013.

7. Coordinating Ministry for Economic Affairs. 2011. Republic of Indonesia Master Plan on Accelerating and Expanding Economic Development in Indonesia 2011–2025.

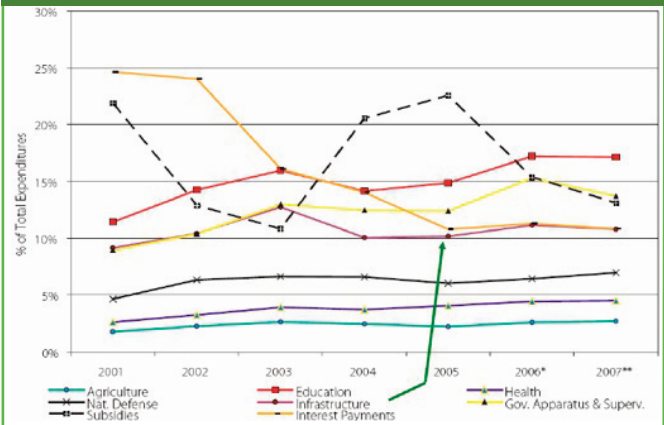
Picture 1 Children crossing a collapsed bridge to get to school in Banten, West Java



Source: Republika Online, 23 January 2012.

Unfortunately, the government lacks the funding to fulfill its ambitions to develop infrastructure as set out in MP3EI. As the data in Table 1 (below) indicates, average annual infrastructure spending only represents 10% of total government expenditure and 2% of GDP.

Table 1. Public expenditure trends for infrastructure development from 2001-2007



Source: Bappenas (Ministry of National Development Planning), 2011.

According to the government, one of the issues in infrastructure development is “viability gap funding” or the gap between available and required funding for economically viable projects. The government is only capable of providing 29.1% of total funding, or about US\$ 213.3 billion, for the projects envisioned by the MP3EI plan. On the other hand, the private sector is expected to cover 51% of total financing. The government introduced the PPP scheme as a means to

mobilize financing to address the huge “viability gap” of over 20% of the funding requirement for the MP3EI.

2.2 Private sector role in infrastructure development in Indonesia

The private sector’s role in infrastructure development is not a new phenomenon. In 1998, when Indonesia was in the throes of an economic crisis, the country signed a Letter of Intent (LOI) with the International Monetary Fund (IMF)⁸ as part of an effort to lift the nation out of the financial turmoil that erupted in East Asia in 1997. This agreement was the culmination of a series of measures undertaken by the government of Indonesia with support from international agencies, to push for the privatization of the public sector. The World Bank, for example, gave Indonesia loans to restructure its railway industry in the 1990s in order to attract private investors. It also pushed for changes in the model of railway management from a majority state-owned company to a limited liability company.⁹

The government has also involved foreign companies in the water utility sector in Jakarta. In 1997, its operations shifted from the state-owned PAM water company to two private operators, PT PAM Lyonnise Jaya (PT Palyja) and PT AETRA (previously owned by PT Thames PAM Jaya). This PPP was sealed through a 25-year concession contract. The agreement was based on a 1995 letter issued by then-President Suharto that appointed both private companies without an open or competitive tendering process.¹⁰

Indonesia first partnered with the private sector in 1974 for the construction of the Jakarta-Bogor-Ciawi (Jagorawi) toll road by a partnership with the state-owned enterprise, PT

8. LOI IMF Charter 15 states that the master plan for the restructuring and privatization of all state enterprises over the medium term has been adopted and publicly released. The master plan also provides for the review of the regulatory framework in the key privatized sectors. Except for a specified short list, the program calls for all 150 state enterprises to be divested over the next decade. Details of companies to be privatized during 1999–2001 are included in the plan, focusing on hotels, trading, construction, mining, and civil engineering firms, and fertilizer producers. In the meantime, enterprise efficiency would be improved through greater management autonomy, enhanced competition, hard budget constraints, and the phased elimination of preferential access to bank credit by end of March, 2000. Companies to be restructured during this period in preparation for later privatization include the state electricity corporation and the national airline (IMF 1998).

9. See Nikmah *et al.* study, “World Bank Funded Project on Railway Efficiency in Indonesia”, published by INFID in May 2008.

10. KRUHA,” 2011. KRUHA is a civil society coalition in Indonesia that promotes the fulfillment of the right to clean water.

Jasa Marga. This collaboration was reinforced with a toll-road concession agreement in 1987 in which PT Jasa Marga was responsible for the management of the toll road. By 1997, at least 553 km of toll roads were constructed and operational in Indonesia. Of this total, 418 kilometers are now operated by PT Jasa Marga, while the remaining 135 kilometers are managed by the private sector.

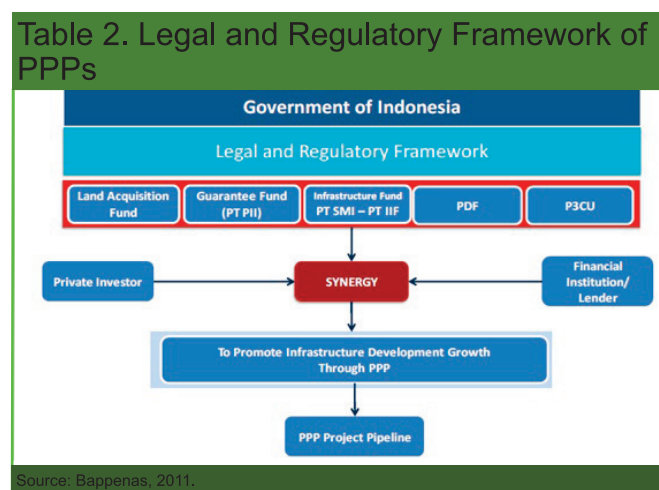
Indonesia's PPP scheme for infrastructure management has faced a barrage of criticism. Based on experience in railway and water-management schemes, private sector involvement does not necessarily mean improved public services.¹¹ Sub-standard services have denied people access to safe and affordable drinking water. This is also the case for the country's toll roads, which have declined in quality. Another criticism in an OECD¹² report is that most, if not all, PPPs in Indonesia are in the form of concessions, mostly using traditional procurement procedures. This applies to highway-construction projects in which the government appoints a public agency – PT Jasa Marga – as the toll-road operator without going through an open tendering process. PT Jasa Marga has been allowed to foster cooperation with private partners in managing toll roads in specific locations. The agency's appointment is another illustration of how infrastructure management projects are not won through an open bidding procedure but through direct appointments, often with strong political influence.

The private sector has also criticized PPP schemes, particularly the government's reluctance to provide risk guarantees for private investors involved in infrastructure development projects. When the provincial Jakarta government announced plans to build a monorail system in partnership with the private sector, an agreement could not be reached on who would bear the risks if revenues could not cover production costs due to overestimates of demand for services. The Jakarta administration later requested that the central government issue a letter of guarantee stating that the gov-

ernment would cover such risks. However, due to the absence of appropriate regulations, such a guarantee could not be provided. As a consequence, private investors were hesitant to enter the infrastructure business, particularly for high-risk projects such as rail and highway construction in the eastern part of Indonesia. Private investors are only interested in infrastructure projects with unquestionable economic value, such as those in the energy and toll-road sectors.

The government responded to these criticisms by developing a new partnership scheme that removes such obstacles. For example, it made sure that sector-specific laws and regulations eliminate the monopoly role of state-owned or state-controlled enterprises in the conduct of infrastructure activities. Although in some sectors a state-owned company will be the *de facto* partner in a PPP project, there is generally no requirement that private investors must partner with a state-owned company. The government also declared that competitive tendering is required for all PPP projects and, therefore, sole-source tender is no longer permitted.¹³ Finally, the government formulated a guarantee scheme that provides assurance to private investors.

Based on lessons learned from previous PPP practices, the government designed the legal and regulatory framework for PPPs as illustrated below.



11. KRUHA observed that many of Jakarta residents have no access to clean water. Those who have been PAM Jaya's customers since 1997 waited for 7 years before they were connected to clean water supply (Civil Society Petition Demanding for Termination of Clean Water Supply Concession Contract in Jakarta, 2011).

11. A concession system means that the state (or municipality or other public entity) delegates to the private sector the right to provide a service, yet retains some control over the sector by incorporating in a concession contract or license the terms and conditions – including the rights and obligations of the service provider – that will govern the infrastructure project or company (World Bank, 1995, p.1).

13. Republic of Indonesia. 2010. *Public-Private Partnership (PPP) – Investor's Guide*. p. 13.

The role of each institution is defined as follows:

- For land acquisition, funds for private sector purchases are reimbursed from the budget of the relevant ministry. For example, land acquisition for road infrastructure involves the Ministry of Public Works, railway infrastructure involves the Ministry of Transportation, oil and gas pipelines involve the Ministry of Energy and Mineral Resources and other relevant ministries. Funds, however, are reimbursable to the private partner only if the infrastructure project is proven to be financially viable.
- The Indonesian Infrastructure Guarantee Fund (IIGF) is a business entity established on December 30, 2009. IIGF is responsible for guaranteeing private sector risks under the PPP scheme. It acts as the guarantor for risks that may occur because of the government's actions or inactions, which may result in financial losses to the PPP infrastructure projects. This could include delays in the processing of permits and licenses, changes of rules and regulations, lack of tariff adjustment, failure to integrate the network/facilities and other risks that are borne by or allocated to the government in each PPP contract. The legal foundation for the establishment of IIGF is Government Regulation No. 35/2009 on Participating Interest of the Republic of Indonesia for Establishment of Infrastructure Guarantee Corporation. This regulation allows the Ministry of Finance to use fiscal funds to guarantee infrastructure projects.¹⁴
- PT Indonesia Infrastructure Finance (IIF) is a private enterprise funded by its founding shareholders, including US\$ 55 million¹⁵ from the government of Indonesia through PT SMI under the Ministry of Finance; US\$ 36 million from the Asian Development Bank; US\$ 36 million from the International Finance Corporation (IFC); and US\$ 18 million from DEG-Deutsche Investitions-und Entwicklungsgesellschaft mbH. PT IIF subsequently obtained a loan from the World Bank of US\$ 90 million and grant aid from the government of

Australia for the establishment of PT IIF¹⁶. Funds from the government of Australia go through the Indonesian Infrastructure Initiative consultant that provides technical assistance to the government of Indonesia.

- The Project Development Fund (PDF) is administered by Bappenas along with PPP Central Unit (P3CU). Bappenas has prepared the list of projects incorporated into the PPP Book and must make them available to the public. The list provides an indication of the types of infrastructure development which the government will prioritize within a specified time period.

2.3 Risk guarantee scheme

There is no single definition of a PPP, but most mention participation by the public and private sectors in a contractual arrangement that addresses risk-sharing among parties.¹⁷ There are primary risks related to: 1) land acquisition; 2) the level of demand; 3) construction and operations; and 4) government policy. Demand risk arises when there are unreliable forecasts of the need for a good or service. In such a case, the infrastructure design will result in over-supply. Construction and operating risk exist because the costs of building and maintenance generally differ from projections. Policy risk arises from actions by different government agencies which may (often unintentionally) affect the profits of the concession. For example, the government could push tariffs for services below the level needed for full cost recovery. Based on such unforeseen problems, guarantees are necessary to make PPPs viable.

The government has identified the potential risks of Indonesian PPP projects and designed ways to offset them:

- Land Acquisition Fund. This revolving fund enables the government to purchase land in advance of the project; it may be reimbursed by the private partner at a later date.
- Guarantees. According to Dudi Rulliadi,¹⁸ IIGF is the heart of Indonesia's PPP scheme. The entire

14. IIGF 2013.

15. All figures are presented in dollar equivalents.

16. Using currency with 1 US\$ equivalent to IDR (Indonesian Currency) 11.000.

17. See Engel *et al.*, 2008.

18. Dudi Rulliadi. 2013. *Guarantee Fund in Indonesian Public-Private Partnership (PPP): International Design As Domestic Innovation*.

scheme is laid out in the Presidential Regulation concerning "Government in Cooperation with Business Entities for the Provision of Infrastructure".¹⁹ As a new institution, IIGF has regulations providing legal certainty of compensation and government guarantees to private partners. Formally established as a State-owned Enterprise (SOE), the IIGF is staffed by private professionals (not civil servants) and operates with dual mandates: to provide financial guarantees to private investors and to act as a fiscal risk manager. In its role as a guarantor, IIGF guarantees the financial obligations of government contracting agencies in PPP contracts with private investors. In the event of an agency's default, IIGF as the guarantor will pay a certain amount of compensation to the private counter-party.²⁰ Rulliadi further stresses that IIGF is an independent institution modeled according to the World Bank's definition of a guarantee fund, that is, a fund with "liquid assets that can be rapidly mobilized in the event that a contingent liability is realized." The fund would have its own balance sheet, be removed from the annual budget cycle, and benefit from independent governance. The government of Indonesia cited this definition when establishing the IIGF.

Only one project has currently been provided with a guarantee from IIGF, namely the CJPP, with a 2000 megawatt (MW) capacity and valued at US\$ 4 billion. According to Sintya Roesly (quoted by Wibowo, 2012):²¹

"The structure of a guarantee is a co-guarantee structure between IIGF and the government of Indonesia with a burden-sharing concept, whereby IIGF will provide the guarantee under the first loss basis on the agreed amount and the government of Indonesia will cover the remaining amount. However, the government of Indonesia will not provide back-up for the IIGF amount except in the case of IIGF insolvency which is caused by the government of Indonesia's action/inaction. The guarantee agreement was

supported by two resource agreements; the first was concluded by Perusahaan Listrik Negara (PLN, the State-owned Electricity Company) and IIGF and the second agreement was between PLN and government of Indonesia."

Wibowo contended that this has occurred because Finance Ministerial Regulation No. 260/2010 stipulates that:

"The provision of an infrastructure guarantee through IIGF will be optimized in order to mitigate the fiscal risk to the state budget. There are two steps available to achieve this plan. First IIGF is to cooperate with a multi-lateral financial institution or any party which has similar objectives, and second, the government has to commit to gradually and sufficiently strengthening the capital structure of IIGF. Currently, IIGF already has a stand-by facility financed by approximately US\$ 480 million from the World Bank."²²

The adoption of a two-step approach reflects the government's cautious stance: the awarding of a guarantee is a sensitive issue. Partnership contracts that provide guarantees through the fiscal budget should be entered into in a transparent manner to ensure that the public is informed about the nature of the obligations of the state and the firms which serve the public.

3. Pilot PPPs project in Indonesia under IIGF Scheme: Central Java Coal-Fired Power Plant (CJPP)

3.1 Public response at CJPP project development site

According to the PPP Infrastructure Projects Plan in Indonesia as well as the MP3EI document, there are 58 potential projects totaling US\$ 51.2 billion, of which 12 projects have already been tendered. There are 18 toll-road projects ready for bidding. Power-generation projects are mostly coal-fired power plants; IIGF has provided guarantees for a construction-ready project, CJPP, which is projected to produce 2000 MW of power for Java and Bali.

19. Presidential regulation No. 67/2005 was later renewed by Presidential Regulation No. 13/2010 and Presidential Regulation No. 56/2011.

20. Rulliadi, 2013.

21. Imam Pandu Wibowo. 2012. *Government Guarantee in Public Private Partnership: The Features of Indonesia Infrastructure Guarantee Fund*. Phd Thesis.

22. *Ibid.*, p.35.

CJPP is the first PPP project in Indonesia under the IIGF scheme. Located in Central Java, the power plant is to be constructed on coastal land endowed with abundant offshore fish resources. Worth US\$ 4 billion, the project was won by PT Bhimasena Power Indonesia on behalf of a consortium of companies consisting of Japan-Power, ADARO (national coal producer), and ITOCHU (Japan). CJPP will use coal to produce high pressure steam to generate electricity. The partnership mechanism with the government will use the BOT (build, operate, and transfer) approach with a concession period of 25 years. IIGF guarantees CJPP that the state-owned power utility company, PLN, is obligated to purchase the electricity produced for a 25 year period with such payments guaranteed by the government and IIGF.²³

Construction of the CJPP project was planned for 2012 and was expected to be operational by 2017. To date, however, construction has yet to commence due to obstacles in land acquisition. Out of 214 hectares of land required for the project, 15% or 33 hectares remain to be acquired.²⁴ But the delayed construction of CJPP is not simply an issue of land acquisition. It also involves economic, social, and environmental concerns. KIARA (2013), a civil society organization supporting communities near the CJPP site, made the following observations:

"There are currently 10,961 traditional fishermen in Batang Tengah who object to plans for the installation of a 2,000 MW capacity steam power plant as it would be disruptive to their lives. Traditional fishing communities from Demak, Pati, Jepara, Kendal, Semarang, Tawang, Wonoboyo, Surabaya, Gresik, Pemalang, Gebang and Indramayu also rely heavily on the Batang coastal area as their main source of livelihood. Apart from the fisherfolk, the lives of at least 7,000 farmers spread across 6 villages - Ponowaring, Karanggeneng, Wonokerso, Ujungnegoro, Sengon (East Roban) and Kedung Segog (West Roban) will similarly be disrupted by the construction plan. Not only will it displace populations in the 6 villages, but it also carries the risk of upsetting the local economy and environmental sustainability of 12 other villages in proximity to the pro-

ject location, namely the villages of Juragan, Sumur, Sendang, Wonokerto, Bakalan, Seprih, Tulis, Karang Talon, Simbang Desa, Jeragah Payang, Simbar Jati, and Gedong Segog."

Environmental organizations, including Greenpeace (2013), have also expressed objections. In a press release concerning the Batang steam power plant, the NGO highlighted the fact that the power station will produce a staggering 10.8 million tons of carbon emissions each year.

Coal is the dirtiest fossil fuel, by far. Apart from being the main contributor of carbon emissions that causes climate change, coal combustion at the power plant will also release a host of toxic pollutants into the atmosphere. These noxious pollutants are harmful to human health, and as such will endanger communities living close to the power station. According to Greenpeace estimates, if construction plans for the large-scale Batang coal-fired power plant is to proceed, it will generate 10.8 million tons of carbon dioxide each year. The power station will also release other poisonous pollutants in huge amounts, among others 16,200 tons of SOx per year, 20,200 tons of NOx per year and 610 tons of PM 2.5 per year.²⁵

"There are currently 10,961 traditional fishermen in Batang Tengah who object to plans for the installation of a 2,000 MW capacity steam power plant"

According to Greenpeace Indonesia, public resistance emerged after local communities observed the impact of the Cilacap steam power plant (another coal-fired power station constructed by Chinese investors, located near the CJPP site). Local residents found that promises made by the government for improvements in the local economy once the steam power plant was in operation were not fulfilled. Some local residents may have been hired to work at the power station, mainly during construction. Once the power plant was operational, local workers could only secure employment as cleaners or office boys, as the local population has low educational levels. The majority of employees at the

23. On its website, the IFC also emphasized that IIGF and the government, acting through the Ministry of Finance, are providing a guarantee to the project to cover payment defaults and potential for termination of payments under required buyout scenarios. The guarantee is supported by agreements to provide reimbursement by PLN for claims made under the guarantee (IFC, 2012).

24. Kompas, September 12, 2013.

25 NOx refers to nitrogen oxides; SOx to sulfur oxides; and PM to fine particulate matter.

power plant are brought directly from China. The Cilacap power station also pollutes the environment, forcing local fisherfolk to seek out alternative fishing areas. In addition, more local residents near the power plant are suffering from respiratory tract infections. These findings have prompted people to reject the CJPP.

When the government first launched the list of infrastructure projects, there were already concerns over potential conflicts arising from the acquisition of land, particularly agricultural land. There was a violation of human rights, when police arrested local leaders in October 2012 at the proposed Central Java site. Finally, there are many environmental issues arising from the infrastructure development process, as MP3EI is oriented towards large scale infrastructure projects.

3.2 Land and infrastructure development

Regardless of whether such projects are run by the government or the private sector, land-related disputes are unavoidable when infrastructure is being developed. According to the Consortium of Agrarian Reform (KPA):

"In the past three years, agrarian conflict in Indonesia has shown an upward trend. In 2010, at least 106 agrarian related cases occurred in various regions across the country, which later rose dramatically to 163 cases in 2011, marked by the death of 22 farmers/residents. In 2012, KPA recorded a further increase to 198 agrarian disputes throughout Indonesia. More than 963,411 hectares of land were in dispute, involving 141,915 households. From 198 cases that took place in 2012, at least 90 of them occurred in the plantation sector (45%); 60 cases related to infrastructure development (30%); 21 cases in the mining sector (11%); 20 cases in the forestry sector (4%); 5 cases related to aquaculture/coastal farming (3%); and 2 cases in the marine sector and coastal areas (1%)."

Agrarian conflicts are likely to intensify as more infrastructure development projects set out in the MP3EI document are implemented using regulations that facilitate land conversions. Such regulations include Law No. 2/2012 on the Procurement of Land for Development of Public Interest and Presidential Regulation No. 71/2012 concerning Implementation of Land Procurement for Development of Public

Interest. These policies allow the government to determine locations for infrastructure development. The public is only informed after decisions have been made. Public grievances can be resolved only through a court of law; meanwhile the development project is allowed to proceed. Despite widespread resistance from the public at the time of the law's passage, the policy is still being enforced.

In addition to policies that facilitate land conversion, the government has also prepared the following three land acquisition schemes:

1. Land capping. The government:
 - 1.1. Supported the increase of land price (land capping) for 28 toll road projects.
 - 1.2. Made an allocation for land capping of US\$ 444.54 million from FY 2008 to FY 2013.
2. The government will finance the cost of land acquisition; the winning bidder is then obliged to compensate the government's land fund.
 - 2.2. The funding from the state budget is approximately US\$ 209.09 million.
 - 2.2. In 2011 and 2012, additional budgetary funding was US\$ 350 million and US\$ 81 million, respectively.
3. The land acquisition fund supports several PPP projects that would otherwise be unviable.

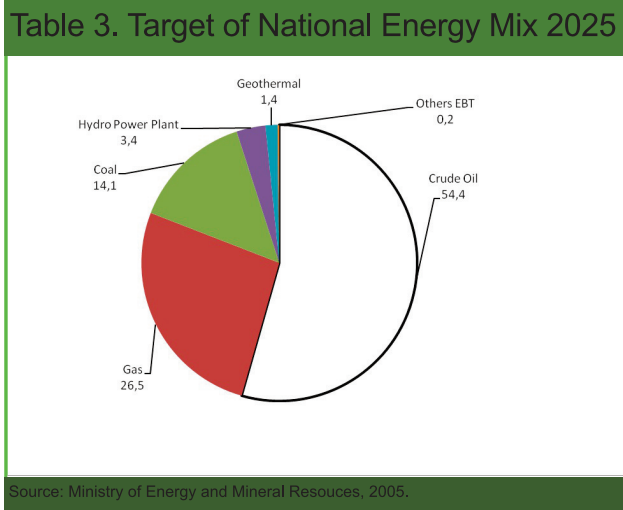
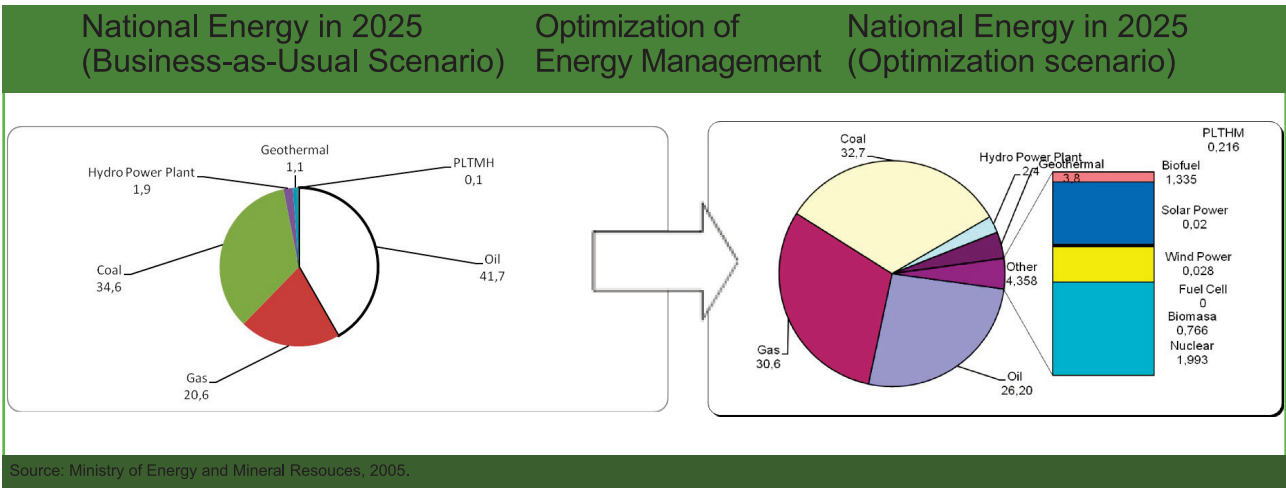
The delay in the CJPP project illustrates one of many land conflicts. With the introduction of PPP policies, conflict is likely to escalate if the government fails to change its infrastructure development approach. This is crucial, as existing policies and schemes fail to take the views of affected people into account.

4. Renewable energy potential under PPP financing scheme

There appear to be few opportunities for PPPs to support renewable energy generation in the projects cited by three key documents: The National Blueprint for Energy Management 2005–2025, MP3EI with its list of infrastructure projects until 2025, and the list of projects currently being

reviewed by IIGF. Table 3 (below) presents the national energy targets by 2025, with a scenario where oil consumption is projected to decrease as a percent of the total energy mix, from 54.5% to 26.2%. Coal usage would increase from 14.1% to 32.7% and natural gas consumption would rise from 26.5%

plants: South Sumatera – 9 Mine-mouth Coal-fired Power Plant, South Sumatera – 10 Mine-mouth Coal-fired Power Plant, and Jambi Coal-fired Power Plant. Another project is the Karama hydropower plant in West Sulawesi.



to 30.6%. Meanwhile, the use of non-fossil energy (renewable energy) in the total energy mix is expected to drop from 19.1 to 10.5%. Non-fossil energy includes hydroelectric power at 2.4%; geothermal at 3.8%; and others at 4.4%.

In other words, priority will be given to three energy sources – oil, coal, and natural gas. This indicates that the government will continue its dependence on fossil fuels rather than promoting the use of non-fossil energy sources, such as geothermal sources. The reliance on coal is especially evident in the PPP Book 2012, in which three of the four priority projects in the power generation sector are coal-fired power

Several initiatives to produce renewable energy, primarily geothermal, are hampered by regulations. The Geothermal Law No. 27/2003 defines geothermal exploration as “mining” when it occurs in forest conservation areas. Therefore, the government is proposing a new bill on geothermal energy which will refer to geothermal concessions as “geothermal utilization” rather than “mining”. The bill will also regulate geothermal energy for direct and non-direct utilization in the areas of protected forests and forest production and conservation areas. According to the Ministry of Energy and Mineral Resources, there are currently 299 geothermal locations with a total potential of 26,617 MW, or 40% of the

total geothermal energy in the world. However, the development of geothermal energy will still represent only 1,341 MW, or 4.6% of the existing potential.²⁶

Meanwhile, it is still not feasible to develop other renewable energy sources, such as wind and wave power, on a large-scale due to financial constraints. In the 1990s, Indonesia actually made attempts to develop these sources, but the economic crisis in 1997 brought these efforts to a halt.²⁷

5. Key points and recommendations

5.1. Key points

5.1.1. The government of Indonesia has issued a series of policies on PPPs, mainly for infrastructure development; from the introduction of cross-sectoral laws that opened up the space for private participation, to presidential regulations and government regulations. These policies are accompanied by the establishment of relevant agencies, either directly under a ministry (such as the P3CU), or indirectly – such as the IIGF. In addition to establishing the IIGF to issue guarantees, the government also set aside resources from its fiscal budget for land acquisition. Infrastructure development of large-scale projects is not being readily accepted by the people, as demonstrated by the case of the CJPP. Resistance is due to the following factors:

First, the government has failed to engage the public in the infrastructure development planning process. Infrastructure development policies focus on state actors, the private sector and international financial institutions, such as the World Bank and Asian Development Bank, and disregard the crucial role that the public should play. The government is responsible for setting policies, establishing institutions, and making budget allocations, while the private sector functions as the operator of infrastructure projects, and international financial institutions provide loans (as well as equity and guarantees, in some instances) to IIFF and IIGF, among others. The World Bank, for example has lent US\$ 29.6 million to the government of Indonesia for strengthening IIGF

appraisal of infrastructure PPP projects requiring government guarantees. If the government is to ensure sustainable infrastructure projects, the public must be involved and their aspirations heard because they are most affected by the development process. For instance, the procedures that govern the Land Acquisition Fund are insufficiently transparent.

As a consequence, the people lack a sense of ownership of infrastructure projects. Instead, the public is often suspicious, seeing these projects as a means to serve the vested interests of large industries. The government already has a development planning mechanism that encourages public participation every five years or on annual basis, but the discussions are thematic and normative in nature rather than focusing on specific projects. The administration instructed the Ministry of National Development Planning to draw up a list of projects for the PPP Book, but the public is once again excluded from the process of identifying projects for implementation.

Second, there is a lack of transparency related to the risks borne by the state; such risks may materialize if the infrastructure project operates at a loss or if it supports the private partner's rate of return or share of profits. The public is unable to access such information, particularly for private participation in earlier projects, mainly for highway construction, drinking water supply, and transportation. Instead, the public must pay more for services each year as tariffs are raised, especially in the three aforementioned sectors, even when services rendered have not improved.

Third, public resistance to the construction of the CJPP raises doubts about the quality of IIGF's assessment of the social and environmental effects. There are two types of project assessment. Type I refers to projects prepared by the IIFF to operate along guidelines consistent with the World Bank's environment and social framework and IFC performance standards. Type II projects are not prepared by IIFF and require in-depth assessment of project design, implementation procedures, and supervisory requirements. The CJPP is a government initiative included in the list of projects in the Master Plan on Accelerating and Expanding Economic Development in Indonesia and it is categorized as type II, which requires supervision.

26. Kompas B, 22 October 2013.

27. See Flacke and Nikmah, *Is Indonesia's Debt to Norway Illegitimate?*, September 2009.

Fourth, the policy package for promoting PPPs has failed to support the development of renewable energy sources or deal with imbalances between regions. Of the four projects that were initiated, three are dependent on the use of coal; the other would generate hydroelectric power. The scheme also shows how infrastructure development tends to lean towards the construction of large-scale energy generation projects. Renewable energy is not yet a government priority. Its current priorities have yet to address the geographical imbalance noted by the research conducted jointly between UI and INFID, which found that for large-scale extractive industries, infrastructure development remains focused on the western part of Indonesia. Infrastructure disparities are evident when comparing the western areas with other regions or large- with small-scale industries.

5.1.2. Although the CJPP has at times been mentioned as the first PPP project, such public-private schemes have existed for several decades. The earliest PPP project was launched in the 1970s for the management of toll roads. The scheme was not considered a success by international bodies since it emphasized the role of SOEs instead of private firms. In addition, Indonesia did not rely on competitive tendering processes or provide private investors with a guarantee scheme. This has become the basis for the government, with support from international financial institutions, to issue a series of policies that promote PPPs and have SOEs play a minimal role, develop an open tendering mechanism, and establish a guarantee provider.

5.1.3. The establishment of IIGF is considered the centerpiece of PPPs in Indonesia. It was formed in 2009 to provide financial guarantees. The World Bank played a significant role in pushing for the establishment of IIGF through its loan scheme. Although IIGF is technically a SOE, the World Bank and the Indonesian government designed it to reduce the influence of the government, increase market confidence, and enable the market to control its performance. The existing regulatory and institutional framework is now using market-based mechanisms to manage infrastructure. The government, therefore, is currently promoting PPP practices that deepen the role of the private sector by reducing the role of the state.

5.2 Recommendations

Recommendations for advancing Indonesia's development agenda are:

5.2.1. Promote public participation in infrastructure development from planning and implementation to oversight. This process should be transparent. Infrastructure is a public good and, as such, the public should be a part of the development process. Involvement should begin during preliminary identification, siting and design. To date, the public is involved and informed only after a project has been identified and sited. It has never been part of the initial stages of the infrastructure project cycle. Public participation in infrastructure development planning is crucial because it affects the economic, social and cultural life of the people, either those benefiting from infrastructure development or those at risk of losing their land or livelihoods. Reforming the process is essential to building a sense of ownership and minimizing agrarian conflict. The government needs to integrate development planning into the infrastructure development process from local to national level. Public participation should also be transparent, making clear the financial burden borne by the government and showing the financial gains received by the private sector.

5.2.2. Facilitate public control of the IIGF. The institution should be placed under a ministry, preferably the Ministry of Finance. IIGF was established as a SOE. While it is linked to the government, it has independent management. Given that funds are to be sourced from the fiscal budget, IIGF should be under a ministry to facilitate public control through existing planning and budgeting mechanisms. The available institutional model impedes the public's ability to use political mechanisms to control IIGF performance. This can be addressed if the IIGF is under a ministry with duties and powers controlled by parliament.

5.2.3. Expand the government's role in providing public infrastructure, mainly for drinking water, transport, and physical infrastructure in under-developed areas. Based on Indonesia's experience in PPP schemes, private actors tend to invest in bankable infrastructure projects. There has

seldom been a private investor willing to underwrite small-scale infrastructure projects, particularly in under-developed areas. Also, one of Indonesia's major infrastructure problems is people's lack of access to potable water, public transport and physical infrastructure in under-developed regions. This is part of the government's unfinished work that needs to be

completed. The absence of adequate basic infrastructure worsens poverty in under-developed areas. In light of this, the government needs to increase its commitment to developing the country's infrastructure, both in terms of budget and policy. It should not rely excessively on the private sector.

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Implications of Turkey's Coal Projects for Society, the Environment and Democracy

Fidanka Bacheva McGrath and Daniel Popov

Summary

In 1994, Bernard Lewis called Turkey “the only Muslim democracy”;¹ more recently, the World Bank called it “an example from which other countries in the region can learn”.² Using its strategic position at the crossroads of Europe, the Middle East, the Caucasus, the Caspian, the Mediterranean and North Africa, Turkey has come to play the role of a powerful regional leader. Its democratic credentials came under attack in the summer of 2013, however, when the environmentalist protest at Gezi Park in Istanbul turned into a countrywide protest against the government,³ which is accused of growing authoritarianism and denial of civil rights of freedom of speech, peaceful assembly and peaceful protest.

In Turkey, democracy is increasingly seen as participatory decision-making on issues that affect daily life without constraining electoral processes, e.g., voting at election times.⁴ The European Commission noted in its 2013 Progress Report “[t]here is a growing and active civil society in Turkey. The Gezi Park protest in Istanbul and related protests across Tur-

key in May and June 2013 reflected the emergence of vibrant, active citizenry.”⁵ The increased visibility and influence of the civil society movement promises that the democratization process in Turkey will intensify and the participation of citizens in strategic discussions on issues, such as energy, will strengthen.

This paper focuses in particular on the development of coal mining and power generation and their effects on society, the environment and democracy in Turkey. The paper presents three case studies, highlighting the financial aspects of projects and the governance and public participation issues related to them. The paper concludes that the current surge in developing the coal sector in Turkey is dictated by development and policy inertia, which by default favors a business-as-usual approach that could lock the country into fossil fuel technology for generations.

The paper discusses Turkey's energy strategy and argues that the priority – namely, to expand coal-fired power production in order to enhance energy security and decrease dependence on oil and gas imports – is illogical, since new coal power capacity will cause increased dependence on coal imports. Thus, it will effectively increase dependence on imported energy and intensify energy insecurity in the long run. The other government priority – enhancing security of supply by expanding power production from renewables – would not be compatible with coal expansion, and therefore is not ambitious enough. Examples in the European Union have demonstrated that transforming the

1. Lewis, B., 1994, “Why Turkey is the Only Muslim Democracy”, *Middle East Quarterly*, March 1994, pp. 41-49, URL: <http://www.meforum.org/216/why-turkey-is-the-only-muslim-democracy>.

2. World Bank, *Turkey Overview*, URL: <http://www.worldbank.org/en/country/turkey/overview>.

3. Bechev, D., *Turkey's democratisation package: a stage, not the final destination*, European Council of Foreign Relations, URL: http://www.ecfr.eu/blog/entry/turkeys_democratisation_package_a_stage_not_the_final_destination.

4. Yaninc, B., 15 Oct 2013, “Gezi protesters brought Turkey closer to the EU”, *Hurriyet*, URL: <http://www.hurriyetdailynews.com/gezi-protesters-brought-turkey-closer-to-the-eu.aspx?pageID=449&nID=56227&NewsCatID=412>.

5. *Op. cit.*, EC, Turkey. 2013 Progress Report.

energy sector to accommodate larger renewable energy capacity requires smart grids and flexible power generation units (for example, plants running on natural gas or biomass that can easily be switched on and off), which works against inflexible coal and nuclear units.

It is crucial that Turkey should not miss the opportunity to take a more sustainable path and bring greater benefits to society in the long term. In the mainstream energy security debate, responding to increasing domestic demand and closing the energy capacity gap is a challenge that gives priority to conventional sources. However, it is a great opportunity for transforming and modernizing the country's energy system by promoting the role of clean energy and enhancing efforts to conserve energy.

1. Political background

During the last decade, Turkey has experienced rapid economic development, with foreign investment flooding in, consumer credit exploding and privatization of Turkish companies by foreign buyers. In May 2013, Turkey proudly repaid the final US\$ 421 million installment of its debt to the International Monetary Fund (IMF) after decades of bailout deals. But in 2013,⁶ the remarkable rate of economic growth slowed down, as emerging economies have become victims of developed countries' monetary policies, especially "quantitative easing" by the USA, which entails the Federal Reserve pumping US\$ 85 billion a month into its banking system.⁷

Turkey is a member of the G20 and will become its president in 2015; in that role, it will host the tenth G20 Leaders' Summit that year.⁸ As the next G20 president, Turkey is in the G20's 2014 troika with the current president (Australia) and the former president (Russia). In the run up to its G20 summit, however, Turkey had faced important local elections in March and June; presidential elections in August 2014, as well as parliamentary elections yet to come in 2015. Despite

the weakening of the Turkish economy and the fact that in mid-2013, support for the government hit its lowest point since the 2011 elections,⁹ the ruling Justice and Development Party (AKP) gained a victory in the local elections. Nevertheless, Prime Minister Recep Erdogan is still under conflicting pressures to improve economic performance and to appease those with environmental and social concerns related to grandiose infrastructure plans and projects.

"It is crucial that Turkey should not miss the opportunity to take a more sustainable path and bring greater benefits to society"

Furthermore, in 2013, the European Union (EU) and Turkey renewed their accession negotiations and, accordingly, there was a substantial increase in the amount of European public money (from EU funds or EU financial institutions) entering Turkey to be used mainly for the harmonization of Turkish legislation with the EU's, for capacity building and for infrastructure projects. Attempts by the Turkish government to advance EU membership negotiations and build a positive international image were overshadowed¹⁰ by the crackdown on media freedom¹¹ and the brutal confrontations in June 2013 in Gezi Park (and beyond) between police and protesters of urban redevelopment and infrastructure projects.

Despite the progress in many thematic areas during the EU accession negotiations, there have been increasing concerns about the social and environmental sustainability of energy and climate change mitigation policies and related projects. Public participation in decision-making has been limited not only for climate and energy policies, but also large-scale infrastructure and energy projects.

The lack of dialogue on decisions about energy investments raises concerns about the Turkish democratic model and

6. Parkinson, J. and Peker, E., *The Wallstreet Journal*, 06/09/13, "Turkey's Once-Golden Economy Buffeted from All Sides", URL: <http://online.wsj.com/article/SB10001424127887324886704579052871861015240.html>.

7. Khor, M., *The Star*, Malaysia, 09 Sept 13, "Turmoil in emerging economies", re-published by the Third World Network Info Service on Finance and Development on 10/09/13.

8. Turkish Ministry of Foreign Affairs, G20, URL: <http://www.mfa.gov.tr/g-20-en.en.mfa>.

9. Onur Ant, 17 July 2013, "Erdogan Facing Elections Can't Count on Basic Aid", Bloomberg, URL:

<http://www.bloomberg.com/news/2013-07-16/erdogan-facing-elections-can-t-count-on-basci-aid-turkey-credit.html>.

10. European Parliament, 13 June 2013, Resolution on the situation in Turkey (2013/2664(RSP))

11. *The Observer*, 04/08/13, "Turkey's lack of democracy is storing up problems. Prime Minister Erdogan has much to boast about, but the vision of hope is fading fast", URL:

<http://www.theguardian.com/commentisfree/2013/aug/04/turkey-democracy-free-press-journalism>.

on-going administrative reform. As stated by the European Commission (EC)'s 2012 progress report, "The increased ministerial powers introduced in August 2011 over the independent regulatory authorities remained, and in at least one instance — in relation to the Energy Directive — run counter to EU legislation."¹² The report also comments on the limited progress made on "access to justice" and points to "an increasing tendency" to draft and adopt legislation without the necessary public participation. This is unfortunate, because having positioned itself as a regional leader,¹³ Turkey has the rare opportunity to follow a climate and environmentally friendly sustainable development path and set an example for the countries in its sphere of influence.

2. Dominant models for infrastructure development

Since 2009, Turkey has experienced a boom in the construction of coal-fired power plants in response to growing energy demand,¹⁴ increasing gas prices and the availability of indigenous coal reserves. Over the last decade, Turkey is second only to China in terms of the rate of increased demand for natural gas and electricity. Indeed, the International Energy Agency (IEA) estimated that Turkey will likely see the fastest medium to long term growth in energy demand among the IEA's member countries.¹⁵

According to the World Resources Institute, Turkey plans 50 coal-fired power plants with a total installed capacity of 37,000 MW.¹⁶ This will rank Turkey first among OECD countries investing in newly installed coal capacity and fourth globally, behind only China, India and Russia.¹⁷ Some pro-

jections suggest up to 86 new coal plant projects, when accounting for those that are in the process of permitting and those that have so far failed the application process.

There has been a great deal of revision of the regulatory system that has affected permitting procedures and the quality of environmental impact assessments (EIAs). Environmental groups believe that a number of changes to the procedures introduced by the government represent a serious weakening of regulatory mechanisms. The result is a growing number of legal complaints. It is common for EIAs to be thrown out in courts; for example, a court injunction in August 2013 not only cancelled the EIAs of 17 thermal power plants, but also required the Energy Market Regulatory Authority (EPDK) to consider a full review of all EIAs for power plants. This situation presents a major risk to project finance and a major risk to the environment, because EIA reports are widely viewed as insufficiently robust.

2.1. What specific projects are proposed?

An April 2013 fact-finding mission to Turkey by CEE Bankwatch Network and Greenpeace Middle East revealed the following:

- The absence of adequate EIAs for either the planned coal power plants or the cumulative impacts of facilities, which would serve mines, transport infrastructure such as roads and ports, and transmission lines, among other things.
- Lack of strategic environmental assessment in the Turkish energy strategy and related plans and programs on the national or regional level.
- Disregard for public concerns and limited access to information about the environmental, social and economic impacts of the proposed coal projects on local and national economies.
- Lack of a strategy on the part of international financial institutions for addressing the challenges of the Turkish energy mix.
- Limited discussion at the policy or project level about energy alternatives such as solar installations, integrated energy efficiency measures or small scale renewable energy.

12. European Commission, 2012, *Turkey Progress Report*, URL: http://ec.europa.eu/enlargement/pdf/key_documents/2012/package/tr_rapport_2012_en.pdf.

13. European Commission, 2013, *Turkey Progress Report*, URL: http://ec.europa.eu/enlargement/pdf/key.../2013/package/tr_rapport_2013.pdf.

14. O'Byrne, D., 16 June 2011, "Turkish power: coal or gas", *Financial Times* blog:

<https://www.google.com/#q=FT+blog+Turkey+energy+demand>

15. Turkey's Ministry of Foreign Affairs, URL:

<http://www.mfa.gov.tr/turkeys-energy-strategy.en.mfa>.

16. World Resources Institute, 2012, Working Paper. *Global Coal Risk Assessment: Data Analysis and Market Research*, URL:

http://pdf.wri.org/global_coal_risk_assessment.pdf.

17. International Energy Agency, 2012, *Medium-Term Coal Market Report: Coal demand among OECD countries in Europe is projected to increase on average by a mere 0.4% per year during the outlook period (from 2012 to 2017), with the bulk of this increase from growth in coal demand in Turkey*.

This chapter builds on the “Black Clouds Looming” report¹⁸ from that mission, which presents two case studies from the Black Sea region visited by CEE Bankwatch. Additionally, this chapter includes a case study¹⁹ of a project from the Aegean region of Izmir, which expects a decision on financing from the European Bank for Reconstruction and Development (EBRD) in 2014.

Case study 1: Amasra coal plants

The city of Amasra is located on the Black Sea coast and is one of the most popular seaside destinations near Ankara. An ancient settlement still boasting a beautiful fortified city, in 2013 Amasra was added to the tentative list of UNESCO's World Heritage sites. The region is also rich in natural heritage, with the Küre Mountains National Park, which is one Europe's 100 forest hotspots most in need of protection, only ten kilometers from Amasra.²⁰ The park hosts the most intact examples of Black Sea moist karst (i.e., irregular limestone) forest ecosystems in the world.

For many years, Amasra has been proposed as the location of a massive coal-fired power plant. In 1999, the first proposal for a 150 MW thermal power plant was rejected. In 2005, the project was revived by Turkey's Hattat Holding when it obtained permission to explore for coal reserves in Amasra and near-by Bartın. In 2007, three mineshafts were opened, two of which were greenfield developments, and Hema Energji, Hattat's energy firm, applied for a permit to construct a new 1,320 MW coal-fired power plant in 2008. In 2010, Hema requested another permit for a second coal plant, bringing the total proposed coal-fired power capacity in Amasra to 2,640 MW.

Both of these plants are just three kilometers from Amasra, between the villages of Gömü and Tarlaagzı. Hattat Holding and its two subsidiaries, Hema and Batı Karadeniz Elektrik Üretim A.Ş., signed a deal with the Chinese Datong Coal Mine Groups to operate the coalmine. Meanwhile, in May 2013, Turkish media also reported a deal with China's Harbin

Electric International worth US\$ 2.4 billion for construction of coal thermal power plants in the Amasra area.

The plans for turning Amasra from a rich cultural and natural heritage site into an industrial site pose serious threats to the livelihoods of local communities and the development of the region as a tourism destination. The government's West Black Sea Development Agency recently published the first draft of its “2014–2023 West Black Sea Region Plan,” which analyzes the region's potential for economic development and confirms the concerns that the proposed thermal power plants are the number one threat to Amasra.

The EIAs for the two power plants are not yet complete, as several plants are proposed by energy companies for the same location. Public meetings on the projects – rebranded as the Batı Karadeniz Entegre Power Plant and Hema Entegre Power Plant – were planned for the summer of 2013, but were postponed indefinitely due to ongoing local protests.

Concerned citizens, with support from the mayors of both Amasra and Bartın and a local parliamentarian, organized the “Bartın Platform” – a coalition against coal power plant developments in the region.²¹ The platform proposes an alternative development path based on tourism and fishing and has suggested that wind energy should be given priority, since Amasra is one of the two regions with the highest wind speeds.²²

“Concerned citizens, with support from the mayors of both Amasra and Bartın and a local parliamentarian, organized the Bartın Platform”

The EIAs do not provide a clear analysis of impacts and risks on water resources in the Amasra region (coal deposits are located beneath the aquifer zone). One greenfield exploration, the Kavsaksuyu – Selen Su field, is located in the area

18. Stefanova, A. and Popov, D., 2013, *Black Clouds Looming. How Turkey's coal spree is threatening local economies on the Black Sea*, CEE Bankwatch Network.

19. The SOCAR Aegean Refinery case study was researched with the help of local stakeholders from the Aliaga Peninsula of Izmir Region.

20. Kure Mountains National Park web site: http://www.kdmp.gov.tr/alt_detay-en.asp?id=10.

21. For more arguments against the coal-fired power plant, see Bartın Platform (in Turkish), 36 reasons for not granting a coal plant permission in Amasra, URL: <http://www.bartınplatformu.org/bizden-haberler/196-36-soru>.

22. See this map by the Turkish State Meteorological Service (in Turkish), URL: http://www.mgm.gov.tr/FILES/arastirma/ruzgaratlasi/107_tra9mart.jpg.

of a water reservoir that serves drinking water to 100,000 people every day. Two other deposits pose significant threats to the balance between salt and fresh water in the coastal basin due to their proximity to the coast. The Amasra coastal zone is recognized as a fish reproduction area by the Turkish environmental authorities and is bound to be adversely affected, since the thermal plants' cooling systems will use sea water, a process which has yet to be assessed.

Furthermore, the EIAs for the coal plants lack mention or analysis of the effects of several facilities associated with power generation. For example, due to the low caloric value of the coal reserves (2,000–3,000 kcal), an enrichment facility is needed to bring the calorific value of coal to 6,000–7,000 kcal. This facility and its effects are not assessed in the EIA. Additionally, detailed information about the location of the tailings treatment facility and plans for disposal of ash waste are missing. Finally, there is little information about the plan for building a seaport in the village of Gömü next to the plant, which will be capable of docking large ships for import of coal.

Case study 2: Coal power complex at Çatalagzi

Çatalagzi in the province of Zonguldak is only forty kilometers from Amasra, so awareness in Amasra about coal impacts is high. The Çatalagzi Power Plant (CATES) is a coal mining and thermal power complex where, since 1948, the state electricity company has managed two 150 MW units. Since 2008, the private company ZETES (Zonguldak Eren Termik

"the EIAs for the coal plants lack mention or analysis of the effects of several facilities associated with power generation"

Santrali), owned by EREN (Eren Enerji Elektrik Üretim A.S.), has operated three units including one of 160 MW (ZETES-1) and two of 615 MW (ZETES-2). EREN contracted out the two latter units to China National Machinery and Equipment Import and Export Corporation (CMEC), which brought around 1,500 workers from China to Çatalagzi.²³ In total, the

surrounding villages and environment is affected by 1,690 MW coal-fired facilities and another projected 1,220 MW.

In 2009, EREN constructed a new coal port, the largest on the Black Sea, with enough capacity for 170,000 DWT (deadweight tons) ships. In 2012, the company applied for a license for two new 660 MW units (ZETES-3). Because of environmental problems with the current ZETES plants and the quality of the EIA report, the EIA permit for the two new units was appealed in court by a local initiative committee. In April 2013, the court put the project on hold. Instead of appealing the court decision, EREN submitted a request to the environmental authorities to increase the current power capacity of one plant, which is a simpler procedure than acquiring an EIA permit for two new blocks.

In 2003, before the new plants began operations, the concentration of heavy metals in the region was estimated at two to five times higher than the average in Europe for iron, cobalt or arsenic. Currently the power stations burn a total of 17,000 tonnes of coal per day, causing pollution that poses risks to human health. There is no ash landfill at the ZETES plants, although this was a precondition in the EIA in order to secure an electricity license. A visit by Bankwatch to the ash pond where ash and sludge reside before landfilling revealed these substances are not being collected, raising concerns about air pollution in the area. Flocks of sheep and herds of goats graze on the edges of the pond, raising questions about the management of the area and measures to limit contamination.

A study conducted by Hakan Kutoglu from Zonguldak's Bülent Ecevit University indicates an increase in the surface and soil temperature of Çatalagzi by four degrees. It has issued warnings about the potential consequences of the temperature rise on human health. The plant also committed to provide heating to households in Çatalagzi using the cooling water from the power plants. An April 2012 report from the Scientific and Technological Research Council of Turkey (TÜBİTAK) shows that it is possible to heat 1.5 million households using cooling water from the ÇATES and EREN power complexes, preventing the emission of 5 million tonnes of carbon dioxide gas and 100,000 tonnes of sulfur dioxide.

23. Atli, A., 30 November 2010, Chinese workers liven up the Turkish coal town, URL: <http://www.sarkekspresi.com/?p=150>.

A number of severe effects of the pollution on people's health and the environment have been identified over the years. Around 20 percent of children in the area are born with underdeveloped lungs; asthma and chronic obstructive pulmonary disease are widespread; cancer rates are steadily on the rise.²⁴ Incidents of cancer were the subject of a state study quoted in the EIA for ZETES 3, which concluded these were caused by "the frequent use of cigarettes" rather than by industrial pollution in the region. During public consultations on the EIA for the ZETES 3 plants, residents of Çatalagzı demanded health analyses and regular monitoring of emissions. Meanwhile, EREN has not fulfilled a commitment to launch a system through which the plant's flue gases can be monitored online by authorities.

Last but not least, coal mining has raised concerns about health and safety standards in mines and unfair labor conditions, as seen by recent miners' barricades.²⁵ For example,

"A number of severe effects of the pollution on people's health and the environment have been identified over the years"

the Chinese company in charge of mining explorations, Datong, has hired Chinese workers at a wage of US\$ 100 per month, well under the Turkish minimum wage of about US\$ 400. In addition, due to poor safety precautions, accidents frequently occur during shaft construction, with the latest in June 2013 resulting in the death of one and the injury of two Chinese workers.²⁶

Journalists have investigated the poor working conditions²⁷ and as a result, even former miners from local communities are disillusioned about the possibility of work in the mines or

the power plant. Hema's coal mine should have begun extraction in 2010, but so far, no local coal has been produced and only 40 people from the village of Tarlaagzı, three kilometres from Amasra, are currently working for Hema.

A parliamentarian from Zonguldak, Harun Akin, has raised concerns about the employment of Chinese workers: "Importing workers from China at a time when there are a lot of unemployed in Çatalagzı is questionable. Bringing technical personnel from China is one thing, importing workers to take advantage of cheap labor is another."

Case study 3: SOCAR Aegean Refinery Project

The State Oil Company of the Azerbaijan Republic (SOCAR), purchased the Petkim petrochemical plant from the Turkish government in 2007. The plant is located in the Aliaga Peninsula of Izmir Region. On this peninsula, there are numerous highly polluting facilities, including the country's largest oil refinery, the Koc Group's Tupras. Before Tupras and Petkim were sold in privatization programs, they were a single facility. Together with consultants from the Jurong Petroleum facility in Singapore, SOCAR put together a plan to make this peninsula a complex of fossil fuel facilities.

According to official project information from the EBRD,²⁸ the developer, owner and operator of the Aegean Refinery is STAR Rafineri A.S., a joint stock company incorporated under Turkish law. The joint venture is now 81.5 percent owned by SOCAR TURKEY Enerji A.S. (a 100-percent subsidiary of SOCAR) and 18.5 percent owned by TURCAS Rafineri Yatirimlari A.S (a 99.6-percent subsidiary of Turcas Petrol A.S.). SOCAR is expected to transfer 40 percent of its shareholding in STAR to the State Oil Fund of the Republic of Azerbaijan (SOFAZ), which will provide equity funding through the Ministry of Economic Development of Azerbaijan; thus the Ministry of Economic Development will hold equity in the project on behalf of SOFAZ.

The project involves the construction of a greenfield refinery in Aliaga, as well as a "secret" 675 MW coal plant, which is associated with the refinery but has not been included in the environmental and social impact assessment

24. Today's Zaman, 13 Jan 2013, "Zonguldak's thermal plants blamed for rise in cancer cases", URL:

<http://www.todayszaman.com/news-303858-zonguldaks-thermal-plants-blamed-for-rise-in-cancer-cases.html>.

25. Libcom.org, 26 Nov 2013, "300 Turkish miners barricade themselves underground", URL:

<http://libcom.org/blog/300-turkish-miners-barricade-themselves-underground-26112013>.

26. News on Bartın.info (in Turkish), "Collapse in Amasra, 1 Dead, 2 Injured", URL:

<http://www.bartın.info/guncel/page/guncel/amasrada-gocuk-1-olu-2-yarali-h8904.html>.

27. News (in Turkish) on Enerjitr.com, 26 Nov 2013, URL:

<http://enerjitr.com/cinin-tek-cocuk-magdurlari-zonguldakta-300-liraya-mahkumhttp://enerjitr.com/turk-bulamiyorus-cinli-isciler-calissin>.

28. EBRD Project Summary Document, URL:

<http://www.ebrd.com/english/pages/project/psd/2013/42605.shtml>.

for the project.²⁹ Additionally, the project will block access to and possibly destroy a geothermal resource, for which a license was granted in 2009 to the Turkish renewable energy company Buhar Enerji.

In June 2010, the SOCAR Turkey Aliaga Refinery was granted a license for the same site and since August 2011, SOCAR has been undertaking heavy excavation works. Excavation is being carried out by a construction company owned by the Aliaga mayor's son. With local government leaders in a conflict of interest regarding the project, local activists face severe pressure. Nonetheless, the public opposes the project,³⁰ and an initial coal plant EIA meeting was canceled due to protests³¹ and later "rescheduled" without informing the local community.

In 2013, the EBRD announced its intention to invest US\$ 150 million, and a Board decision was expected in early 2014. In April 2014, however, the EBRD announced its withdrawal from the project.³² With this project, the EBRD would have been setting an example in Turkey, as Turkish banks would have lent under any conditions, as long as the EBRD puts its name on the loan package. It is official that EP bank Unicredit is the lead financial arranger; it has disseminated the due diligence reports to other commercial banks and these reports do not include mention of the coal plant or the geothermal reservoir. After the withdrawal of the EBRD, SOCAR confirmed to have an agreement with a commercial bank to replace the loans.³³

Currently a local non-governmental organization and Buhar Enerji, the renewable energy company that holds the license for the geothermal resource, have submitted complaints to the Project Complaints Mechanism of the EBRD.

29. ESIA document can be found on EBRD's, IFC's and SOCAR's web sites, URL: <http://www.socar.com.tr/sites/default/files/esiaeng.pdf>.

30. Change.org petition (in Turkish), URL:

<http://www.change.org/tr/kampanyalar/european-bank-for-reconstruction-and-development-ebd-international-finance-corporation-ifc-unicredit-akbank-garanti-bankas%C4%B1-i%C5%9F-bankas%C4%B1-denizbank-ve-finansbank-ali%C4%9Fa-yar%C4%B1-madas%C4%B1-nda-yeni-rafineri-ve-termik-santral-yat%C4%B1r%C4%B1mlar%C4%B1n%C4%B1-finance-etmeyin>.

31. News in Turkish incl. a video, URL:

<http://www.haberler.com/aliaga-termik-santrala-hayir-dedi-ced-toplantisi-5204355-haber/>.

32. See: <http://abc.az/eng/news/80185.html>

33. See:

<http://bankwatch.org/news-media/blog/case-secret-coal-plant-turkey-suggests-polluted-future-country>

2.2. What are the risks of the dominant models for infrastructure development and proposed projects in Turkey?

A major objective of Turkey's energy strategy is to decrease its reliance on energy imports, predominantly of oil and gas from Russia, and to focus on developing domestic energy sources.³⁴ Plans to increase coal and renewables capacities do not necessarily lead to slowing down the development of gas infrastructure – both pipelines and power plants. With the current rush for coal power, Turkey is simultaneously planning to become a major transit country for natural gas, and licenses have been granted for 14,000 MW of new gas fired plants and another 15,000 MW are in the permit application process. If they are built, burning Turkey's lignite coal will be uneconomical.

Moreover, there is a real danger that the country will only enhance its overdependence on oil and gas imports and add a reliance on coal imports, since Turkish coal production is a) not likely to be sufficient to satisfy increased demand and b) not competitive with cheaper extraction of better quality coal in other countries. Therefore, declarations that local coal will increase energy security mainly serve political purposes to justify state support (in the form of subsidies) and counter local opposition.

Turkish coal reserves are not sufficient to supply the planned new coal capacities; a tripling of coal-fired power generation will therefore not triple domestic coal mining, but will increase reliance on coal imports. The Western Black Sea region visited by Bankwatch has the largest hard coal reserves in Turkey and produced around 2.8 million tonnes in 2010.³⁵ At the same time, expanding production capacity is difficult due to geological structures (very deep underground deposits which require labor intensive extraction). Coal production is therefore declining rather than expanding. Turkey currently imports ten times more hard coal than it produces, e.g., in 2010 it imported 26.9 million tonnes of hard coal for thermal power plants, steel production, industry and domestic heating purposes. Of this, 38.3

34. Pamir, N., 2010, "A view of the energy security in Turkey and in the EU from Turkish perspective," Heinrich Boll Stiftung. See also Kadras, S. 19 May 2010, *Turkey unleashes new energy strategy plan*, URL:

<http://www.eurodialogue.org/Turkey-Unleashes-New-Energy-Strategy-Plan>

35. Eurocoal, Turkey, URL:

<http://www.euracoal.be/pages/layout1sp.php?idpage=475>

percent came from Russia, 10.6 percent from Colombia, 9.0 percent from the USA, and 7.6 percent from South Africa.³⁶

In fact, the future mega power plants on the Western Black Sea are expected to use imported coal. In Çatalagzı – in the heart of the coal-producing region – only the old coal-fired power plant uses local coal. The newly built plants rely on imported coal; the same is expected for the planned new facilities. Amasra project promoters claim their plant will use local coal – but at the same time, the project includes a mega port. New coal mining explorations have been ongoing for seven years, but there has been no production of hard coal, even though the contract stipulated that it would start in 2010. This raises questions about the technical feasibility of reaching these deposits.

So far one of the government's strongest arguments in support of this greenfield development has been the use of local reserves. Yet concerns about the viability of exploring local coal reserves and the ability of investors to tap incentives reserved for utilizing domestic sources to generate power, could call into question the economic sustainability of the project.

The production costs of local extraction in the Black Sea region are estimated at between US\$ 80-150 per tonne, as the coal reserves are deep below sea level. Currently, the world price for coal averages US\$ 60 per tonne. Clarity on the supply of coal is crucial in assessing the economic feasibility of separate projects, but the unpredictability of coal prices should not be underestimated. This underlines the risk Turkey takes by locking itself into a coal infrastructure which may prove too costly to run.

2.3. What are the alternatives, why and how should they be pursued?

It would be unfair to suggest that the government does not promote renewable energy. According to its Energy Strategy, Turkey has committed to a target of 30 percent renewable energy by 2023 (the centennial of the Republic). However, the renewable energy potential in the country is significantly higher and the incentives are not large enough. For example,

36. *Ibid.*

the first licensing round for development of solar photovoltaics (PV) in June 2013 was capped at 600 MW, but attracted 500 applications with a total 8.9 GW (exceeding the cap by a factor of almost 15).³⁷ Interestingly the majority of investors that submitted applications were Turkish companies who have already made financing deals with major investors.³⁸

The decision to cap solar investments is controversial since Turkey has the second largest solar thermal capacity in Europe.³⁹ In view of such potential, solar targets are negligible in the Turkish energy plans, with a 2023 target for installed capacity of solar power of only 3,000 MW (10 percent of the current installed capacity in Germany).

Additionally, producers of thermal solar boilers are emerging and supplying the domestic market.⁴⁰ These are small scale companies that do not benefit from state support, although investment for innovation and efficiency improvements could make them very competitive on local and international markets. There are also Chinese companies developing PV production in Turkey and taking advantage of easier licensing of products for export to Europe.⁴¹

Regarding other renewable energy sources, Turkey ranks number one in the world in wind energy growth. It currently uses just five percent of its projected potential in this area.⁴² This reflects the fact that feed-in tariffs for renewables are below the rates in countries such as Germany and Greece. The development of hydropower energy in Turkey has

37. Neidlein, H. C. and Meza, E., 17 June 2013, "Almost 9 GW of projects submitted for licensing in Turkey", *PV Magazine*, URL:

http://www.pv-magazine.com/news/details/beitrag/almost-9-gw-of-projects-submitted-for-licensing-in-turkey_100011739/#axzz2my9qiM4W.

38. *Ibid.* Foreign investor interest in this round was estimated to be fewer than 5% of the total applicants.

39. Globaltrade.net, URL:

<http://www.globaltrade.net/f/market-research/text/Turkey/Environmental-Technologies-Climate-Solar-Power-Market.html>.

40. Ali-Oettinger, S., 26 June 2013, "Schmid sells three module lines to Turkey", URL:

http://www.pv-magazine.com/news/details/beitrag/schmid-sells-three-module-lines-to-turkey_100011843/#axzz2my9qiM4.

41. X Hans-Christoph Neidlein, H.C., 23 May 2013, "China Sunergy opens PV module factory in Turkey", *PV Magazine*, URL: http://www.pv-magazine.com/news/details/beitrag/china-sunergy-opens-pv-module-factory-in-turkey_100011462/#axzz2my9qiM4W; Clover, I., 10 Oct 2013, "CSUN realizes first 'Made in Turkey' modules", URL: http://www.pv-magazine.com/news/details/beitrag/csun-realizes-first-made-in-turkey-modules_100013053/#axzz2my9qiM4W.

42. World Bank, 30 May 2013, "Wind, Water, and Steam – a Triple Win for Turkey's Energy Sector", URL:

<http://www.worldbank.org/en/news/feature/2013/05/30/wind-water-steam-a-triple-win-for-turkey-energy-sector>.

meanwhile raised public concern about access to limited water resources, enclosure of the commons and severe environmental impacts.⁴³

It appears that the development of renewable energy by the Turkish government is strategically limited instead of promoted. By failing to allow for a real transformation of the country's energy system, the current strategy gives preference to conventional power. This is not surprising, since Turkish authorities are well aware of the European Union (EU) experience that demonstrates the competition between conventional power and renewables. In Turkey's neighbor Bulgaria, for example, the explosive growth of renewable power has effectively challenged the role of coal and nuclear in the energy mix.⁴⁴ As a result, Bulgaria backtracked on its progressive renewables policy and cut feed-in tariffs, to the horror of investors in the sector, including international financial institutions (IFIs).

The EU experience shows that the transformation of the energy sector, with greater penetration of renewable power, requires phasing out fossil fuels and/or conversion of coal plants into gas or combined cycle plants. Since gas plants are much more flexible to switch on and off, depending on the need to balance the renewables supply into the grid, coal is in fact the fossil fuel most vulnerable to competition from renewables.

In light of the devastating impact of coal on human health and the environment, preferential treatment of coal is hardly justified. A recent study by the Health and Environment Alliance (HEAL) estimated that the annual health costs associated with coal power generation in 2009 in Turkey was EUR 6.6 billion.⁴⁵ Below, this paper discusses additional costs hidden in different kinds of state subsidies for coal. It appears that Turkey is protecting coal and other fossil fuel interests by attempting to limit renewables development.

Last but not least, in the area of energy efficiency, Turkey is striving to reduce its energy intensity⁴⁶ levels by 20 percent between 2011 and the end of its centennial year.⁴⁷ The country has received billions of dollars in investments from IFIs towards achieving this goal, either as direct loans to industry or via financial intermediaries' (FI) loans to small and medium enterprises (SMEs). The logistics of lending directly to big industry are easier and the effect of these investments is clearer; the results from FI credit lines are harder to establish (see below).

The Turkish government should rethink its approach, because stronger support for renewable energy and energy efficiency, and a conscious decision to move away from fossil fuels, can improve delivery of the policy objective of diversifying the energy sector and decreasing the country's dependence on imported energy. Moreover, the energy alternatives above can better serve local needs, with significantly fewer adverse impacts on the environment and local livelihoods.⁴⁸ They could provide affordable energy and create jobs more efficiently than developing coal power.

3. Financing Turkish energy infrastructure

In early 2013, Turkey introduced a number of rules to incentivize investment in new coal power plants with the questionable logic of justifying these "as a part of its energy diversifying efforts."⁴⁹ The government has granted developers favorable corporate income tax allowances through investment participation rates, exemptions from customs duties and VAT, and support for employers' contributions to insurance premiums. Investors that use domestic sources of coal to generate power have the right to benefit

43. Gibbons, E, 29 May 2011, *The Guardian*, "Turkey's Great Leap Forward risks cultural and environmental bankruptcy", URL:

<http://www.theguardian.com/world/2011/may/29/turkey-nuclear-hydro-power-development>.

44. ICIS, 7 July 2013, "Bulgarian TSO may switch off nuclear unit to balance system", URL:

<http://www.icis.com/heren/articles/2013/06/07/9676690/power/edem/bulgarian-tso-may-switch-off-nuclear-unit-to-balance-system.html>.

45. HEAL, 7 March 2013, The unpaid health bill. How coal power plants make us sick, for data on Turkey see URL:

<http://www.env-health.org/resources/press-releases/article/coal-s-health-bill-reaches-eur43>.

46. Energy intensity is energy consumption of energy per unit of GDP.

47. *Op.cit.*, World Bank, 30 May 2013.

48. Renewable energy can have negative effects if implemented without strict sustainability criteria and standards. Adequate regulation is necessary to ensure that climate and biodiversity protection objectives will not clash, and that local communities' land use and access to resources will not be compromised.

49. Investment Support and Promotion Agency of Turkey, 31 May 2013, Turkey expands incentives for coal production, URL:

www.invest.gov.tr/en-US/infocenter/news/Pages/310513-turkey-coal-production-incentives-expanded.aspx.

from Region-5-level⁵⁰ support instruments, the second most beneficial in the whole regime, regardless of the actual investment location.⁵¹ Moreover, the government also helps by providing favorable terms for the allocation of state-owned land near domestic lignite production sites.

The Turkish financial sector is backing the contradictory objectives of the government to ostensibly decrease import dependency and to increase energy production, mainly through coal-fired power plants. Turkish banks have invested US\$ 25 billion in the energy sector in the last five years.⁵² According to finance sector projections, 50,000 MW of capacity is scheduled for installation in Turkey by 2023. While funding for 20,000 MW has been secured, financing for the remaining 30,000 MW has yet to be confirmed. The Turkish banking sector is confident that it can provide the finance and has identified domestic coal projects as one of its priorities.⁵³

IFIs, including the World Bank, the European Investment Bank (EIB) and the EBRD, have supported Turkish energy developments, particularly as Turkey progresses the liberalization of its energy market. Nonetheless, the strategies developed by IFIs for Turkey fail to address the lack of competitiveness of renewable energy and energy efficiency measures because of high subsidies for coal power plants.

Both the EIB and the EBRD have backed sustainable energy and have invested to strengthen the competitiveness of the Turkish economy through support for financial institutions. Since 2009, the EIB has helped the Turkish financial sector with more than EUR 4 billion in credit lines, or roughly 44 percent of the bank's portfolio in the country. Key Turkish partners for both banks have been AkBank, DenizBank, FinansBank, GarantiBank, IsBank, VakıfBank and YapıKrediBank. The same Turkish banks are also key players in the

development of future coal power plants. For example, IsBank and Garanti Bank are the main financiers of Eren's plans for the development of the ZETES 3 coal plant.

It is no easy task to identify the final beneficiaries of EIB and EBRD FI credit lines in Turkey, as such information is not publicly available. Neither bank's assessment of their main partner banks - in terms of their standards and capacity to deliver on policy objectives - is available. Both the EBRD and the EIB should be transparent about whether their loans to these FIs are indirectly supporting the construction of new coal power plants in Turkey.

4. Civil society movements, including social movements and organized resistance, related to energy infrastructure.

Turkish civil society is relatively active, with a strong grassroots base and environmental groups that are sensitive to social justice issues. With regards to the energy sector, civil society groups were until recently focused on nuclear and hydroelectric power. Strong opposition movements, reflecting wider public discourse, were mobilized by government plans to promote the Akkuyu Nuclear Power Plant in Mersin,⁵⁴ the infamous Ilisu dam, dozens of other big dams and hundreds of small hydropower projects.⁵⁵

So far, the problems surrounding coal have been the focus of decentralized opposition, although it is becoming more centralized and more visible due to the government's push for coal power. This said, the public became more aware of coal issues that surfaced at a time of intensifying pressures on the environment from a variety of sectors - for example a boom in construction and transport infrastructure and transition in the agricultural/food production model. The

50. Region 5 and 6 (out of six regions altogether) are the least developed in Turkey and accordingly receive the most investment incentives. For more information, see the web site of the Investment Support and Promotion Agency of Turkey, Turkey's Investment Incentives System, URL: <http://www.invest.gov.tr/en-US/investmentguide/investorguide/Pages/Incentives.aspx>.

51. Investment Support and Promotion Agency of Turkey, 09 April 2013, "Turkey's coal reserves to fire more power plants", URL: <http://www.invest.gov.tr/en-US/infocenter/news/Pages/090413-turkey-coal-reserves-used-for-power-generation.aspx>.

52. Erturk, E., 2013, "Banks expect coal plants to cut in?? natural gas in merit orders", CEEN Enerji, URL: <http://www.ceenerji.com/sayfa/complimentary-story-of-the-weekbanks-expect-coal-plants-to-cut-in-natural-gas-in-merit-orders-304/>.

53. *Ibid*.

54. Okur, M. and A. Eren, R., 2011, "In Turkey, A 100-Mile Show Of Hands Against First Nuclear Plant", URL:

<http://www.worldcrunch.com/world-affairs/in-turkey-a-100-mile-show-of-hands-against-first-nuclear-plant/c1s2960/#.UqXZmH2Q5to>; Celikkan, E., 29 July 2013, "Building of Turkey's first nuke plant faces delay risk", *Hurriyet*, URL:

<http://www.hurriyetdailynews.com/building-of-turkeys-first-nuke-plant-faces-delay-risk.aspx?pageID=238&mid=51565&NewsCatID=348>.

55. For more information see news and overview on Turkey by International Rivers, URL:

<http://www.internationalrivers.org/campaigns/turkey>.

public and the environmental and social justice movements may be too overwhelmed to focus on coal in the same way as they did on nuclear.

The civil society movement in Turkey has considerable experience in opposing projects that threaten human health, local livelihoods and the environment. When the Black Sea region was threatened by expansion of coal mining and electricity production, the Bartın Platform was organized to oppose new coal plants, with the support and participation of the mayors of both Amasra and Bartın and two regional members of parliament.

Despite strong local alliances over controversial projects, it has become increasingly clear that the movement should target policy making at national level. This would require an understanding of a wider set of issues and different types of collaboration to address more complex dilemmas. For example, the questions are no longer what is the alternative to nuclear, or what is the alternative to coal, or how can hydro-power be sustainable? The issue is how to carry out a long term transition of the energy sector in order to remove state subsidies of conventional fuels, internalize hidden costs, decarbonize and provide jobs.

There is increasing public awareness about the limitations of Turkey's development model. The global financial and economic crisis has also fuelled the movement's belief that the current model not only ignores very high environmental and social costs, but is also inefficient and insensitive to the well-being of the population.

It was therefore not surprising that, in mid-2013, the protest against the government's infrastructure plans for Gezi Park in Istanbul morphed into a national pro-democracy movement against the Turkish government. The European Commission (EC) noted in its 2013 Progress Report "[t]here is a growing and active civil society in Turkey. The Gezi Park protest in Istanbul and related protests across Turkey from May-June reflected the emergence of vibrant, active citizenry."⁵⁶

The prime minister challenged the Gezi movement to stand for elections, not to protest in the streets. Some have followed his advice and attempted to extract

political dividends.⁵⁷ This limited interpretation of democracy, however, is no longer accepted in Turkey, because democracy is increasingly seen as participatory decision-making on issues that affect daily life - not only electoral politics.⁵⁸

5. Turkey's energy and democracy

The increased visibility and influence of civil society groups as a result of the protests that began in Gezi Park in 2013 suggests that the democratization process in Turkey will intensify and the participation of citizens in strategic discussions on energy will strengthen.

In October 2013, the Erdogan government announced a "democratization package"⁵⁹ that was well behind the times.⁶⁰ The package proposed reforms on key questions, such as the equal rights of ethnic and religious minorities (Kurds, Alevi and Christians), which will have implications for the whole country, for example through education reform. Additionally, it lifted the ban on wearing headscarves by public servants and proposed an overhaul of the election system.⁶¹ But the package failed to lift the many legal restrictions on freedom of speech, end police violence against demonstrators or bring justice for the victims of police abuses.⁶²

57. Kazim, H., 15 Nov 2013, "Turkish Discontent: Gezi Protests Spawn New Party", *Der Spiegel*, URL:

<http://www.spiegel.de/international/europe/new-party-born-of-gezi-park-protest-faces-hurdles-to-power-in-turkey-a-933887.html>.

58. Yaninc, B., 15 Oct 2013, "Gezi protesters brought Turkey closer to the EU", *Hurriyet*, URL:

<http://www.hurriyetdailynews.com/gezi-protesters-brought-turkey-closer-to-the-eu.aspx?pageID=449&nID=56227&NewsCatID=412>

59. Nas, A., 14 Oct 2014, "Democratization in Turkey: the end of the First Republic?", *Open Democracy*, URL:

<http://www.opendemocracy.net/alparslan-nas/democratization-in-turkey-end-of-first-republic>.

60. Shafak, E., 4 Oct 2013, "Ankara fails to deliver on democracy", *The Guardian*, URL:

<http://www.theguardian.com/commentisfree/2013/oct/04/ankara-fails-deliver-democracy>.

61. Hayatsever, H., 30 Sept 2013, "Government takes steps on headscarf, Kurds, electoral system", URL:

<http://www.hurriyetdailynews.com/turkey-to-lift-ban-on-headscarf-introduce-kurdish-education-with-democracy-package-.aspx?pageID=238&nID=55393&NewsCatID=338>.

62. Sinclair-Webb, E., 30 Sep 2013, "From Turkey, Mixed Signals on Reform", *Human Rights Watch*, URL:

<http://www.hrw.org/news/2013/09/30/dispatches-turkey-mixed-signals-reform>.

56. *Op. cit.*, EC, Turkey. 2013 Progress Report.

The package did not include proposals for implementing the European Charter of Local Self Government.⁶³ This would be a positive step for energy sector development by giving local communities and authorities a greater say in decisions about infrastructure projects that affect them. This conflicts with local and regional development strategies; it is not surprising, therefore, that the Turkish government is incapable of giving communities and regions the freedom to choose their development path in ways that can override national objectives of strategic importance (for example through tourism).

In political struggles, asserting the rights of communities can be a more powerful strategy than asserting the rights of individuals. But even in the most advanced democracies, the state usually reserves the power to rule on issues of national importance. For example, energy security, with its close link to national security, remains strictly in the domain of state policy. Nonetheless, local and national interests need to be balanced through more transparency and public participation, and Turkish authorities are expected to gradually further democratize their decision-making in line with best practices in the EU.

Turkey can also learn from its peers in the G20. In advanced liberal democracies and the emerging economic powers, there are important examples of alternative models of energy ownership and of progressive responses to the climate crisis.⁶⁴ Turkey could participate in this “premier forum” and then promote cutting-edge solutions to energy and climate dilemmas.

6. Turkey, the G20 and climate action

Turkey has not been actively involved in the UN-led climate negotiations and has not made any climate mitigation commitments for the first period under the Kyoto Protocol (2008–12). Therefore, it would be important if the G20 launched climate initiatives to which Turkey could be a party.

For example, Turkey joined G20's latest declaration in St. Petersburg, committing to:

- “rationalize and phase out inefficient fossil fuel subsidies that encourage wasteful consumption.”
- “assess existing obstacles and identify opportunities to facilitate increased investment into more smart and low carbon energy infrastructure, particularly in clean and sustainable electricity infrastructure where feasible.”
- “support the full implementation of the agreed outcomes under the United Nations Framework Convention on Climate Change (UNFCCC) and its ongoing negotiations.”⁶⁵

In Turkey, the energy subsidy reform agenda has been long pursued in the scope of energy-market reform, with emphasis on eliminating petroleum and electricity subsidies, both consumer and producer ones.⁶⁶ The IMF quotes Turkey as an example of success in eliminating inefficient subsidies and liberalizing energy prices, which had positive effects by improving the fiscal position of the government, reducing the inefficiencies in the petroleum and electricity sectors and meeting the preconditions for Turkey's EU membership.

But this raised the issue of whether Turkey is backtracking on its subsidies reform agenda by providing new financial incentives to mine and use coal. Additional questions, from a health and environment point of view, are how to internalize the social and environmental costs in projects' cost-benefit analyses that the public will have to pay.

The G20's role as a potential forum for advancing climate negotiations should not be overestimated. Reports have pointed out that efforts to reform fossil fuel subsidies have been undermined by the inability to agree on common terminology and to devise a transparent and uniform reporting mechanism.⁶⁷ Monitoring progress is problematic; G20

63. Albayrak. A., “Turkey's Long Awaited ‘Democracy Package’: The Rundown”, *The Wall Street Journal*, URL:

<http://blogs.wsj.com/emergingEurope/2013/09/30/turkeys-long-awaited-democracy-package-the-rundown/>. CE, Turquía. *Informe de Avances 2013*.

64. See for example Community Power: <http://www.communitypower.eu/en/>.

65. G20, September 2013, *St. Petersburg G20 Leader's Declaration*.

66. IMF, 28 Jan 2013, “Case studies on energy subsidy reform. Lessons and implications.”, IMF.

67. IORI, 2013, “Mapping G20 Decisions Implementation. How G20 is delivering on the decisions made.” Draft Report, International Organizations Research Institute of the National Research University Higher School of Economics (IORI HSE) and the G20 Research Group of the University of Toronto.

countries have reported subsidies much lower than those reported by third parties, namely the IEA, OECD, World Bank, IMF, UN and non-governmental organizations.⁶⁸ As a result, the IEA said that some G20 members still retain subsidies “that appear to be inefficient, encourage wasteful consumption and are regressive, but are not earmarked for phase out or better targeting.”⁶⁹

However, there is still some optimism that, in spite of the slow pace, there is political momentum for subsidy reform⁷⁰ as well as greater attention from civil society and high profile public figures, who are proposing practical steps to improve the reform’s outcomes. Support is evident: 134 nations declared their backing for the removal of fossil fuel subsidies, and a group of non-G20 countries have formed the “Friends of Fossil Fuel Subsidy Reform”, following the example of the G20.⁷¹

Within the G20, Turkey can learn from its peers. For example, in the period 2008–2009, more than 100 new coal projects were announced in the EU, presaging a “coal renaissance”. Many of them have been cancelled, only a handful of them have broken ground and another dozen are stalled in permitting procedures, as assessments have revealed that the proposals are often economically, environmentally and socially unfit for purpose.

In 2013, China began to take steps to phase-out coal⁷² after summer coal smoke suffocated several major Chinese cities.⁷³ High air pollution levels confined millions of people to their homes. As a result, the Chinese government announced a cap on coal consumption in three provinces, and Beijing and Shanghai are introducing coal phase out plans.

The Turkish government and public should not be blind to the “carbon leakage” threat that coal phase-out in the EU poses to its neighbors. For example, energy companies⁷⁴ that failed to implement their plans to build coal power plants in the EU⁷⁵ are targeting new markets such as Russia, Turkey and Brazil.⁷⁶ Similarly, the role of China as a promoter of new coal power in Turkey, at a time when it is starting to phase out coal at home, should be questioned. Last but not least, coal producers who are squeezed out of their traditional markets are also expected to aggressively promote their companies’ interests in countries such as Turkey, where coal is “on the rise”.

Conclusion

Turkey’s government, headed by Prime Minister Recep Tayyip Erdogan, is under pressure from slowing economic growth and rising energy demand. It needs to make strategic decisions about the direction of development in the most important sector of the Turkish economy – the energy sector. Currently, Turkey’s energy strategy gives priority to coal, despite the fact that sufficient domestic coal cannot be mined at competitive prices. The expected rise in coal imports will undermine the objectives of decreasing dependence on energy imports and of increasing energy security. At the same time, ambitions for renewable energy are curbed by caps that squander the country’s incredible renewable energy potential.

The EC and other international partners acknowledge that the Turkish government has achieved significant progress on its democratization and modernization agenda. But the case studies in this chapter show that there is a long way to go on public participation over energy projects and that past experience with coal mining and power plants are negative. Coal is not seen as a modern solution, but one clashing with local and regional development priorities.

68. Koplou, D., June 2012, *Phasing out fossil fuel subsidies in the G20*, Oil Change & Earth Track.

69. IEA, 2011, *World Energy Outlook 2011*.

70. Bast, E. et al, June 2012, *Low Hanging Fruit: Fossil Fuel Subsidies, Climate Finance, and Sustainable Development*, Oil Change International for the Heinrich Böll Stiftung-North America.

71. *Ibid.* These countries are Costa Rica, Denmark, Ethiopia, Finland, New Zealand, Norway, Sweden and Switzerland.

72. Finamore, B., 29 May 2013, “Five-Part Strategy to Cap and Cut China’s Coal Consumption”, URL: http://www.huffingtonpost.com/barbara-a-finamore/a-five-part-strategy-to-c_b_3353230.html.

73. Reuters, 23 Jan 2013, “China to cap total energy use at 4 bln T coal equivalent by 2015”, URL:

<http://www.reuters.com/article/2013/01/24/china-energy-cap-idUKL4N0AT0OS20130124>.

74. Kakaya, D., 03 May 2013, “E.ON looks to build new brown coal in Turkey”, Greenpeace Turkey, URL:

<http://www.greenpeace.org.uk/newsdesk/energy/news/eon-moves-european-lignite>.

75. Sourcewatch, last modified on 16 October 2013, Proposed coal plants in Europe, URL:

http://www.sourcewatch.org/index.php/Proposed_coal_plants_in_Europe.

76. E.ON, Targeted Growth Outside Europe, URL:

<http://www.eon.com/en/about-us/strategy/strategic-priorities/outside-europe.html>.

Decisions by the Turkish government and financiers on energy infrastructure will be better informed if they consult the public in a transparent manner, and in particular consult the communities whose health and livelihoods are at stake. The growth of the civil society movement in Turkey indicates that the democratization process will intensify and the participation of citizens in discussions on energy will increase.

Turkey must not miss the opportunity to take a more sustainable energy path and provide more benefits to society in the long term. Responding to increasing domestic demand and closing the capacity gap is a challenge. But it is also a great opportunity for transforming and modernizing the Turkish energy system by promoting the role of clean energy and boosting efforts towards energy savings.

Energy Infrastructure Contestations in South Africa

Opposition to financing Eskom's Medupi and Transnet's Durban mega port grows

Patrick Bond

1. Introduction¹

This chapter considers the controversial financing of the two largest mega projects in South Africa (SA), which look set to worsen fossil fuel dependence, socio-ecological degradation, and the country's "Resource Curse." The projects are a coal-fired plant known as "Medupi," constructed to provide power for the grid of the parastatal electricity corporation, Eskom, and the expansion of the country's minerals energy petroleum rail pipeline port complex by the parastatal transport corporation, Transnet. The latter project, focusing on the largest single site at Durban, is still in its early stages (2005–40), while Medupi's first generator is due for completion during 2015, following delays of more than three years.

The two cases are closely related because they will exacerbate SA's self-defeating reliance upon export-led minerals growth and manufactured imports. Although precise cost estimates are impossible at this stage, each project entails large infusions of local and foreign financing (Medupi around US\$10 billion and Transnet's South Durban expansion as much as US\$25 billion). Indeed, in both cases, notwithstanding a sharp and potentially dangerous increase in SA sovereign foreign debt – from US\$25 billion in 1994 to US\$135 billion in 2013 – the two main parastatal corpora-

tions' recourse to substantial external funding was considered appropriate by their managers and by the Treasury. In contrast, when contemplating the foreign debt in 2009, Rand Merchant Bank² predicted SA would soon hit a repayment squeeze.³ The absolute value of foreign debt is likely to exceed US\$140 billion by the time of the 20th anniversary of freedom in 2014.

The two projects have cemented the borrowers' relations with the World Bank and the Chinese Development Bank. Further funding for infrastructure is anticipated via the Brazil, Russia, India, China, and SA (BRICS) bloc when their "New Development Bank" (with an infrastructure mandate) is operational. The design of the Bank was negotiated at the BRICS Summit in Fortaleza, Brazil, in July 2014. In both cases, the financing arrangements are proving highly problematic. In Eskom's case, it obtained the World Bank's largest ever loan in spite of numerous eco-social, economic and governance shortcomings that led to diverse protests and an investigation by the Bank's Inspection Panel. Transnet's expansion of the existing South Durban harbor, as well as the construction of a new port, is hotly contested by local civil society. In both cases, the most important problem is longer-term and global, namely the effect on climate change. Only in the Transnet project is the government

1. This research was made possible only through activist-sourced knowledge, gained as a result of repeated contestations against both Eskom and Transnet by colleagues at the South Durban Community Environmental Alliance, groundwork and the Centre for Civil Society.

2. Rand Merchant Bank Financial Markets Research, "Monthly ZAR outlook", Johannesburg, March 5, 2009, p.2. What makes this debt worse is the interest rate; amongst SA's largest trading partners, only Greece's has been higher, according to the Department of Trade and Industry. One reason interest rates have been so high is to guard against capital flight, which periodically crashes the currency.

3. Patrick Bond, *Elite Transition*, London, Pluto Press, 2000; Connie Fields, *The Bottom Line: Have You Heard from Johannesburg*, Berkeley, Clarity Films, 2010, <http://www.clarityfilms.org/joburg/>.

beginning to recognize this threat, although not in terms of shipping-related emissions, but as a reflection of the port's vulnerability to major storms and sea level rise. Within SA, the BRICS, the G20 and the multilateral institutions, are controversies over the structures, processes and protections associated with development finance. For South Africa, this is a good opportunity to assess the country's priorities, twenty years after the country's first democratic election. Much can be learned at the two sites:

- Medupi power plant. In April 2010, the World Bank offered a US\$3.75 billion multi-tranche credit to the SA government for its parastatal firm, Eskom. The main purpose was to construct the Medupi power plant, but one of the loan conditions required the government to increase Public-Private Partnerships in associated activities, including solar power generation. The project also includes a "fig leaf" renewable energy project (according to one of the Bank's external reviewers in 2010),⁴ and Bank President Jim Yong Kim inaccurately claimed in 2012 that Medupi is a "clean coal" generator.⁵ The impact on climate change is immense; Medupi is a 4764 MW power generating station (the world's third largest, once completed), and two more of the same magnitude will follow. The next plant, Kusile (4800 MW), is already under construction. Local communities, environmentalists (local and global) and workers have regularly contested Medupi. The Bank's Inspection Panel found six major shortcomings in a 2012 report, and further Bank investigations of Eskom in December 2013 also raised serious questions as to whether future tranches should continue.

- Transnet expansion. In March 2013, the Chinese government lent US\$5 billion to Transnet mainly to extend rail infrastructure into the northern and eastern coalfields. This was for subsequent coal exports mainly to India and China, as well as for general financing support that will include the Durban harbor expansion, since such funding is essentially fungible. In addition to increasing the speed and magnitude of coal freight to the world's largest coal export terminal at Richards Bay, Transnet has been raising funds for an anticipated US\$25 billion new port and petrochemical investment in Durban, including a brand new US\$10 billion "Dig Out Port". This will complement the US\$2.3 billion investment to double Transnet's Durban-Johannesburg oil pipeline capacity, due to be completed in 2014. Durban is also a site of offshore oil prospecting, not far from the point where Africa's largest refinery complex stands in hyper-toxic South Durban. There, near universal community opposition has emerged to Transnet's plans, including on grounds of climate damage. Transnet's Environmental Impact Assessment (EIA) consultants made a contentious statement in 2013 claiming larger ships in the new port will result in lower emissions per container carried. They failed to consider the alternative of not increasing shipping eight fold!

In both cases, local activists and a few journalists and academics have disputed the "clean" claim, although it remains to be seen whether the financiers take these broader problems into consideration. In one encouraging sign, the SA government's Department of Environmental Affairs decided in October 2013 that the Transnet EIA for the expansion of the old harbor's berths was unconvincing. (Post-Panamax ships carry more than 5,000 containers and are too big for the pre-expansion Panama Canal). The EIA was temporarily rejected in large parts because of Transnet's climate denialism, as well as the port expansion's impact on bird and fish life.

The two projects confirm the need for disclosure, transparency and participation. In both cases, there are substantial problems with the firms' bona fides, including Eskom's use

4. This was revealed by William Moomaw of Tufts University, an outside evaluator of the Medupi loan;

<http://ia600307.us.archive.org/7/items/PatrickBondWilliamMoomawDiscussClimateJusticeSouthAfricaAndThe/PatrickBond.wmv>. In any case, Eskom's commitment to renewable energy and integrated demand management was erratic, as in early 2014 it simply halted crucial renewable energy subsidies: http://simbalism.co.za/index.php?page=press_Africa_and_Eskom&own-erid=press_Africa_and_Eskom.php&contentid=492.

5. Jim Yong Kim, "Press Conference with WBG President Jim Yong Kim, S. African Finance Minister Pravin Gordhan, and WB VP for Africa Makhtar Diop", September 6, 2013, Pretoria, World Bank, <http://www.worldbank.org/en/news/speech/2012/09/06/press-conference-wbg-president-jim-yong-kim-safrican-finance-minister-pravin-gordhan-wb-vp-africa-makhtar-diop>.

of a private intelligence firm against critics and Transnet's failure – along with the Durban municipality – either to provide necessary information about the port expansion (such as notifying stakeholders about its EIA problems) or to engage in meaningful participation.

The next two sections provide more detail on the financing of the Eskom/Medupi and Transnet/Durban fossil fuel and transport projects. The following section places these mega projects into the context of SA's "minerals energy complex". The concluding section notes the limitations of advocacy, given the power relationship that links the SA state and finance. But, as with the 1980s struggle against apartheid, the weak link in this relationship between state and capital could signal the vulnerability of Eskom and Transnet to international financial sanctions.

2. Eskom's mega power plant at Medupi

The most significant challenge to mega project development finance in SA began in February 2010, when the South Durban Community Environmental Alliance (SDCEA) and the NGOs groundWork and Earthlife Africa launched a multifaceted civil society campaign – unsuccessful in the short term – against the World Bank's largest ever loan. On April 8, 2010, after nearly two months of strenuous activist lobbying against more fossil fuel credits, the bank's board approved the US\$3.75 billion loan to Eskom. Its main purpose was the construction of Medupi, a power station that will pump 25–30 megatonnes of CO₂ into the atmosphere annually, more than the collective output of 115 countries. That loan was a last minute request. In the period 2005–11, approximately EUR3.7 billion was lent to Eskom by 20 major banks,⁶ but in 2009, liquidity shortages compelled Eskom to seek assistance from the World Bank. As a result, there was not much time for more than 200 organizations across the world to formulate a critique of the loan, in large part based on the threat to the world climate.⁷ To establish a threat to an

obscure World Bank loan so quickly, with the purpose of challenging the confidence at the Bank and in Pretoria, required clarity of message, an explicit demand (stop Medupi financing), and a rhetoric that would link various constituencies into a coalition. As always, the critical question is, who wins and who loses?

First, the source areas of the coal for Medupi are highly contaminated by mercury and acid mine drainage, putting air, land, vegetables, animals and people's health at great risk. Forty new coalmines will be opened in impoverished areas to provide inputs to Medupi and its successor, Kusile, as well as for export. This will create several thousand coal sector jobs (hence receiving endorsement from the National Union of Mineworkers), but it appears likely that many more jobs in agriculture and tourism will be lost as a result of the invasive mining activity and downstream degradation. Medupi itself will be built in a water scarce area where communities are already confronting extreme mining pollution. Even though an air-cooled supercritical model (Africa's first) was chosen, the cost of supplying additional water cooling amounted to hundreds of millions of dollars, given the long transport and pumping costs.⁸ Environmentalists and local farmers complained about the destruction of the nearby Mokolo River, in spite of a legal requirement that "Mining cannot impede or divert the flow of water, or alter the bed, banks, course or characteristics of any watercourse."⁹

Once the coal is burned and electricity generated, the winners and losers become even more divergent. Medupi's main beneficiaries are the world's largest metals and mining corporations, especially BHP Billiton (Australia based) and Anglo American (London based), which already receive the world's cheapest electricity thanks to multi-decade deals. During the early 1990s, Eskom had a third too much capacity due to the long SA economic decline. Its solution was to attract huge aluminum smelters to mop up the excess power. The agreements were finally leaked by an opposition member of parliament in March 2010; BHP Billiton and Anglo were receiving electricity at less than US\$0.02/kilowatt

6. BankTrack, urgewald, groundWork and Earthlife Africa, Bankrolling Climate Change, London, 2011, http://www.banktrack.org/show/pages/bankrolling_climate_change_report_on_banks_and_coal

7. groundWork (2009), The World Bank and Eskom, Pietermaritzburg, December, <http://www.groundwork.org.za/Publications/Reports/SpecialReports/worldbankeskom09.pdf> and <http://www.earthlife.org.za/?p=858>.

8. See: <http://ia600307.us.archive.org/7/items/PatrickBondWilliamMoomawDiscussClimateJusticeSouthAfricaAndThe/PatrickBond.wmv>.

9. Sipho Kings, 'Medupi mining puts river in deep trouble', Mail & Guardian, January 11, 2013, <http://mg.co.za/article/2013-01-11-mining-puts-river-in-deep-trouble>.

hour, whereas the overall corporate price was around US\$0.05/kilowatt hour, still the cheapest available anywhere, and the consumer price was around US\$0.10/kilowatt hour.

Affordability, commercialization and the privatization threat

Who lost, in terms of bearing the costs of Medupi? In terms of financing, the repayment of principal and interest required a 127 percent real price increase from 2008–12 for household electricity consumers (to nearly US\$0.12/kilowatt hour).¹⁰ The anticipated 2013–18 annual price rises declined to the 10–15 percent range, but these were still around twice the anticipated annual inflation rate of 6 percent. What is not known is the price elasticity of electricity, and how much less consumers will now use – and in turn, the adverse implications for public health, gender equity, micro entrepreneurship, education and many other issues associated with electricity access.¹¹

Eskom remains committed to its 1998 White Paper mandate of imposing “cost reflective” pricing, i.e. carrying the smallest possible subsidies for ordinary retail consumers. Eskom's continual justification of the Special Pricing Agreements for BHP Billiton and Anglo is that the two huge firms warranted discounts based on economies of scale. For this reason, the claim that expanding electricity supply would be pro poor fails, since the vast bulk of inexpensive power is guaranteed to the multinational corporations. This reflects Eskom's “commercialization” – a step along the path to full-fledged privatization. Indeed, another controversial aspect of the loan was the bank's insistence on partial privatization: Eskom would offer private renewable energy generating capacity to independent power producers as a condition of the loan. Privatization and other forms of commercialization of SA state services have been a failure in every respect, not least because adding a profit incentive of typically 30 percent of capital drastically raises commodity prices.¹²

Corruption

Corruption was another feature that generated criticism of the World Bank by civil society and opposition political parties, and even the influential neoliberal *Business Day* newspaper.¹³ Objectors opposed the loan because, contrary

"As always, the critical question is, who wins and who loses?"

to supposed anti-corruption policies, it directly funds the ANC via the party's in-house investment arm, Chancellor House. Possible kick backs and the direct involvement of a member of the ANC's finance committee led to an investigation by the country's Public Protector, who in 2010 reported conflicts of interest.¹⁴ In 2013, the country's main construction companies confessed to widespread collusion on various state-funded projects. Many of the firms involved in Medupi's construction – including industry giant Murray & Roberts – were found guilty of collusion and fined US\$140 million by the Competition Commission.¹⁵

Labor unrest

A wide variety of problems subsequently emerged in the actual construction of Medupi, continuing into early 2014. These include widespread labor unrest featuring periodic mass strikes and extremely militant protests. By September 2012, 17,000 workers were affected by wildcat strikes and sabotage of equipment at Medupi. In October 2012, 3,000 workers marched to Eskom's main office at Medupi. After a temporary settlement in early 2013, pay protests resumed, leaving 25 employees injured in one incident and triggering a strike of 1,100 workers. Construction was halted for ten weeks. In January 2014, unrest was sparked when workers suffered another lockout. According to Numsa's Stephen Nhlapo, “The workers are angry and other workers might join them. There might be a full blown strike. The way

10. SAPA, “Sweet deals use 5 percent of Eskom's power – Hogan”, April 19, 2010.

11. The literature on multipliers is reviewed in Patrick Bond, *Unsustainable South Africa*, London, Merlin Press, 2002.

12. Patrick Bond, *Elite Transition*, Peitermaritzburg, University of KwaZulu-Natal Press, 2005.

13. Peter Bruce, “The thick end of the wedge”, *Business Day*, April 19, 2010.

14. Ernest Mabuza, “Valli Moosa-Eskom ‘Conflict of Interest’”, *Business Day*, February 19, 2010.

15. Ironically, in February 2010, the World Bank had issued a major statement alongside its annual African Development Indicators, entitled “Quiet Corruption”, in which it blamed African teachers and healthcare workers for moonlighting (a result of bank structural adjustment policies). World Bank, *Silent and Lethal: How Quiet Corruption undermines Africa's development efforts*, Washington, D.C., World Bank, 2010.

things are going, we are going to have big disturbances this year.”¹⁶

Construction incompetence

The main internal crisis emerged because of the unsatisfactory quality of work by corporate contractors. In December 2012, for example, 9,000 welds were discovered to have been performed without heat treatment, contributing to a six-month delay. The Medupi software – the “brain” of the plant that ensures safety – failed repeatedly in 2012. Although originally scheduled for application in December 2012, by November 2013, the software was still not in working order.¹⁷ Minister of Public Enterprises Malusi Gigaba declared that “heads will roll” if Medupi fell further behind.¹⁸

As a result, by March 2013, there were threats of a return to the “load shedding” (brownouts) that had previously made Eskom a national laughing stock. By November 2013, an emergency was declared with enforced cut backs of 10 per cent on the largest consumers, and an emergency appeal was made to the Department of Environmental Affairs for air quality standards near other Eskom power plants to be relaxed.

Surveillance of critics

The combination of structural pressures associated with rising mining and smelting demand, the inability of major corporations to carry out the construction of Medupi, a sense of urgency that bordered on panic and rising class, community, and environmental struggles on the mines drove Eskom to desperate measures. In early 2013, a whistleblower revealed that Eskom had hired a private firm to spy on workers, community activists and environmentalists.

Criticism by the World Bank’s inspection panel

There was also pressure on Eskom from an unexpected source: the World Bank itself. The bank’s inspection panel

assessed 11 of 15 complaints from Medupi area community groups. In May 2012, seven specific failures were identified and presented to the Board of Directors:

- EIAs were not “undertaken proportional to, among others, cumulative impacts” because of lax SA standards regarding the multi-decade effects of Medupi’s pollution;
- “an inadequate assessment by management of capacity at provincial and local authority level”, making municipal regulation of Medupi’s air and water pollution impossible;
- Insufficient expertise for “preparation and implementation of projects that are highly risky or involve serious environmental and/or social concerns”;
- “the operation of the power plant, including the technology for removal of sulphur dioxide from emissions, namely flue gas desulphurisation, will place an additional strain on water resources in an area that is already suffering from water scarcity”, and Eskom “did not fully consider the impacts and risks of water supply alternatives” for local users;
- “considerable risks” regarding “air quality and health issues” because the bank itself failed to “provide adequate information on alternative sources of water for the plant”;
- The emissions from the Medupi plant pose a health risk to local communities, adding to existing background levels of air pollutants; and
- Failure to factor in the “additional strain on public services and infrastructure in the municipality”, which “is poorly equipped in terms of financial and human resources.”¹⁹

After considering this tough critique, the bank’s directors merely slapped its own officials and Eskom on the wrist. The biggest loan in the institution’s history had become so politicized, apparently, that instead of stronger persuasion, such as withholding future tranches, the bank decided that “the outcome of the project relies heavily on a good working

16. Schalk Mouton and TJ Strydom, ‘Darkness looms as Eskom takes more strain’, *Times*, 9 January 2014.

17. Carol Paton, ‘Medupi faces fresh glitches’, *Business Day*, 15 November 2013.

18. Londiwe Buthelezi, ‘Department denies part in Dames’ decision to leave Eskom’, *The Mercury*, 6 December 2013.

19. Tracy Hancock, “Inspection panel findings on impact of Medupi”, *Creamer’s Engineering News*, May 17, 2013, <http://www.engineeringnews.co.za/article/inspection-panel-findings-on-community-impact-of-medupi-2013-05-17>.

partnership between the World Bank and Eskom as well as the country's national and subnational authorities.”²⁰

As problems at Medupi continued, the inspection panel's insistence on more internal oversight of Medupi compelled staff to issue a report to the board in December 2013, which conceded that “the commissioning date will slip by another 4–5 months and is now anticipated for early 2015”. A US\$500 million rail line to move coal to the Majuba power plant was also delayed, requiring the state to “streamline the rest of the tendering processes”, despite reports of major corruption.²¹ Finally, the report revealed yet more ecological threats, including major new water requirements from the highly vulnerable Crocodile River that crosses the priceless Kruger Park game reserve, and desulphurization delays. Eskom filed a “draft application seeking exemption and postponement of Minimum Emission Standards for the Medupi power plant”, asking for an additional four years to desulphur its emissions, something even World Bank staff refused to countenance.

Conclusion

These are all critical problems for Medupi and its financiers. In a 2010 debate, the World Bank's chief Africa economist at the time, Shanta Devarajan, offered these rebuttals:

“The benefits are the increased access to power for many people in the subregion; the costs include some of the points you mention, such as carbon emissions and the financing costs. Our analysis indicated that the benefits outweighed the costs. We included estimates of the shadow price of carbon (based on international estimates) and, of course, the financing costs in that analysis. If you accept the principle that decisions like these should be based on benefit cost analysis, then I would encourage you to examine our analysis and its assumptions (all of which are in the public domain), rather than simply list a series of concerns.”²²

The problem, of course, is that the “increased access to power for many people” ignores the increased cost and diminished affordability, and hence decreased access for poor people. At this stage, without any new power from Medupi and with much higher costs passed to Eskom customers and regional electricity purchasers, there is no data to show just how far the costs to vulnerable people and the environment outweigh the benefits. But there is little doubt they do, and will for future generations.

3. South Durban's Transnet port and petrochemical expansion

By 2040, an estimated US\$25 billion in new port and petrochemical investments will expand what is already Sub-Saharan Africa's largest port, in South Durban, handling 20 million containers annually. This will represent an eight-fold increase from 2.5 million containers in 2012. To this end, SA's National Development Plan named South Durban its second highest priority mega project.²³ Financing could be the most critical element, given that SDCEA has announced it will begin a “financial sanctions” campaign against Transnet if it follows through.

Using internal resources, Transnet was the main investor in the earliest project components: a US\$20 million bridge (2006–10) and a US\$2.4 billion oil pipeline (2007–14). The bulk of investment will occur in both petrochemical expansion (to double pipeline transport capacity) and a new “dig-out port” (estimated to cost US\$10 billion), on which work will begin in 2016. Hence the 2014–16 period is the crucial window in which financing will be assembled. That funding will also pay for a dramatic increase in existing port capacity, so that 5,000+ container “post-Panamax” ships can be accommodated in the current harbor (stages 1–3). In 2016, the dig-out port at the old airport site will be excavated, with an anticipated first berthing in 2020 (stage 4). The final growth of the existing port will include an extensive dig out of the area currently under Transnet railroad siding property (stages 5–6). With liberalization of transport in the early 1990s and the move to road-based trucking, this land is mostly unused.

20. *Ibid.*

21. Nelly Shamase and Matuma Letsoalo, “Saving Cyril: Molewa accused of meddling”, *Mail & Guardian*, November 9, 2012.

22. Shanta Devarajan and Patrick Bond, <http://blogs.worldbank.org/africacan/patrick-v-shanta-round-2>.

23. National Planning Commission, National Development Plan, Pretoria, 2012, <http://www.info.gov.za/view/DownloadFileAction?id=172296>.

Transnet's most critical challenge will be allocating US\$30 billion for other mega-projects, especially given how many aspects of this project are being contested. In March 2013, at the time of the BRICS summit in Durban, SA, Transnet acquired the first tranche of financing for the Durban port expansion – a US\$5 billion loan from the Chinese Development Bank – which apparently comes without conditions (the terms were not publicly disclosed). Subsequently, there were several bond offerings of several hundred million dollars, including on the London markets in November 2013, where Transnet paid an enormous premium of 9.5 percent on its Rand-denominated bonds. But the longer term threat is that the promised BRICS Bank will seek projects like this one, as exemplars of export-oriented infrastructure.

In July 2013, a high profile meeting of the Durban Transport Forum heard Transnet's port expansion director Marc Descoins update his team's planning: "The fatal flaws analysis yielded many risks but no show stoppers".²⁴ Descoins had not, at that time, factored in resident and labor opposition to the mega-project, its vast environmental implications or rising dismay at construction-driven "white elephants." Tracing several of the problems to the port petrochem expansion in South Durban sheds light on the connections between social and environmental grievances. It also highlights a growing economic debate about whether SA's vulnerability to the world economy could grow worse, unless mitigated.

The doubling of oil pipeline capacity

The first part of the port expansion, the Khangela Bridge, was intended to address rising frustration with the delays encountered moving freight from the existing port to the highway system. Originally announced as a US\$7 million project, costs had ballooned by a factor of nearly three by the time the bridge was complete in 2010. One reason was rampant corruption involving three major construction companies.²⁵

The second stage was Transnet's Durban-Johannesburg oil pipeline construction project, lasting from 2007–14. The mega project, known as the "new multi-product pipeline", cost US\$2.34 billion, a dramatic increase, in part because the pipeline was diverted hundreds of kilometers away from the mostly white Durban suburbs to mostly black former KwaZulu Bantustan areas. There were many other cost increases, including apparent collusion on tendering by one of the main pipeline construction companies, Group Five Civil Engineering.²⁶

In his own 2012 review of the cost overruns, without considering construction company collusion, Public Enterprises Minister Malusi Gigaba uncovered "systemic failings that compromised the intended outcomes". He admitted that his project managers "lacked sufficient capacity and depth of experience for the client overview of a mega-project of this complexity", especially related to "analysis of risks". Nor were EIAs or water and wetland permits "pursued with sufficient foresight and vigour".²⁷

SDCEA offered several critiques of the pipeline, including the racially biased routing; inadequate public participation; dubious motivations for the pipeline; government's failure to prevent, detect or manage pipeline leaks; and climate change.²⁸ According to SDCEA, the race and class biases were crucial reasons to reject Transnet's re-routing strategy. The local ecology was already saturated with toxins, SDCEA alleged.²⁹

Many of the same complaints surfaced again four years later in mid-2012, when the next stage of the port petrochem

24. *Creamer's Engineering News*, "Prefeasibility work starts on Durban Dig Out Port", July 5, 2013, <http://www.engineeringnews.co.za/print-version/prefeasibility-work-starts-on-durban-dig-out-port-2013-07-05>.

25. Colleen Dardagan, "Durban to nail tender riggers", *The Mercury*, June 26, 2013, <http://www.iol.co.za/business/companies/durban-to-nail-tender-riggers-1.1538042>.

26. Irma Venter, "Construction industry must deal with 'great anger' over collusion, says Upton", *Engineering News*, August 12, 2013, <http://www.engineeringnews.co.za/article/construction-industry-must-deal-with-great-anger-over-collusion-says-upton-2013-08-12>.

27. Malusi Gigaba, "Where the Transnet pipeline project went wrong", Statement by Public Enterprises Minister Malusi Gigaba, Pretoria, December 2, 2012.

28. South Durban Community Environmental Alliance, "Comments on the Transnet Multi Product Pipeline Proposal," Durban, July 7, 2008. SDCEA suggested: "Refurbishing the existing pipeline in an incremental manner (instead of doubling capacity), as maintenance is required, replacing the sections with a larger pipeline, using the existing route and servitudes, and installing additional pump stations, as and when required. Accelerating the upgrade of railways and public transport in Gauteng, so as to get more people and product off the roads to minimise transport-related congestion, fuel burning, emissions and associated health effects, by establishing urban transport networks to enable safe and affordable rail transport, linked to park and ride centres with connections to bus and taxi routes."

29. *Ibid.* On the climate, according to SDCEA, "the rise of CO₂ emissions that will be facilitated by the pipeline is immense, and is only referred to in the Draft Scoping Report as a potential legal problem, with no details provided."

complex reached fruition: the proposal for a new dig-out port and expansion of the old port. The most heartfelt of the critiques was against displacement because, for many Indian and African residents of South Durban, their earlier neighbors were forced to move into their neighborhoods during apartheid. This was part of the white government's racial displacement strategy. Now the same situation appeared imminent, this time for class reasons.

Displacement and trucking company attacks

SDCEA, the Wentworth Development Forum, Merebank Residents Association and the Clairwood Residents and Ratepayers Association are justifiably convinced that the port petrochem project will generate not just traffic chaos, but residential displacement on a substantial scale. From the north, the old harbor's expansion will displace residents by the thousands from the culturally rich, 150-year-old Indian and African community of Clairwood. That area's African shack dwellers and longtime Indian residents are already under threat from reckless trucking companies, who are beneficiaries of the rezoning, or failure to enforce existing zoning. Drivers killed 70 people in the course of 7,000 accidents in Durban in 2012 alone. The worst single case occurred in September 2013, when 23 people were killed by a runaway freight truck on the Field's Hill section of the alternative (non-tolled) highway from Johannesburg. That accident was revealing, for one of the world's three largest shipping companies, Evergreen, hired a local informal truck company that allegedly instructed its driver to avoid tolls to save US\$4. Police cracked down after the accident and found several of the company's trucks operating under unsafe conditions.

"From the north, the old harbor's expansion will displace residents by the thousands from the culturally rich, 150-year-old Indian and African community of Clairwood"

Local ecological degradation

Opposition from local communities will intensify once the largest part of the port expansion begins in 2016. To dig 20 meters deep for 1.5 kilometers is dangerous, given how many toxic chemicals have come to rest there over the years. Soil, water and air pollution will exacerbate the five-year dust cover, under which the dig-out port's construction will suffocate Merebank and Wentworth, the mainly Indian and colored communities of South Durban. These neighborhoods are already coated with regular oil-related sulfur and soot showers from the oil refining complex, as witnessed by their world leading asthma rates.

In addition to damage to human health, BirdLife SA observed that, since Durban has one of just three estuarine

"That area's African shack dwellers and longtime Indian residents are already under threat from reckless trucking companies"

bays in SA, its ecosystem services value is vast: as a heat sink and carbon sink, for biodiversity, as a fish nursery, for waste disposal, and for storm protection. Moreover, the Bonn Convention's protections for bird migration should make estuaries and wetlands, such as South Durban's, immune from more cementing. In May 2013, Public Enterprises Minister Malusi Gigaba dismissed the worries over "frogs and chameleons".³⁰ In contrast, the ecological damage implied in this stage of Transnet's expansion was so extreme that the Department of Environmental Affairs rejected the first version of the EIA in October 2013, which described the impacts of the build out of two berths to accommodate super post-Panamax ships of 15,000 containers or more. One of the two reasons was Transnet's failure to do more than "monitor" the damage caused to the major sandbank in the middle of the estuarine bay, which hosts so many reproductive processes for fish and birdlife.³¹ Transnet was due to re-submit its EIA statement in early 2014.

30. Lloyd Gedy, "South Durban's battle royal", *City Press*, April 28, 2013, <http://www.citypress.co.za/news/south-durbans-battle-royal/>.

31. Ishaam Abader, "Rejection of the Final Environmental Impact Assessment Report for the Proposed Deepening, Lengthening and Widening of Berths 203 to 205 at Pier 2, Container Terminal, Port of Durban, KwaZulu-Natal Province", Department of Environmental Affairs, Pretoria, October 2, 2013.

Global ecological implications and local climate adaptation

The second reason Transnet suffered an early rejection of its EIA was due to the most important environmental problem of all, climate change. The firm's consultants had not considered the impact of rising sea levels or extreme storms.³² As oceans warm up, cyclones and hurricanes also intensify, with their effect exacerbated by sea level rise. "The volume of Arctic sea ice has been reduced by 75 percent in just 30 years," reported the world's most respected climate scientist, James Hansen of NASA, to the Cornell University Global Labor Institute in 2012: "There is a danger that the ice sheets will begin to collapse and we could get several meters of rising sea levels in one year."³³ Durban suffered an early indication in March 2007, when nearly a billion dollars' worth of coast infrastructure was destroyed. In August 2012, the same Durban port berths proposed for expansion in 2014 were severely damaged during heavy winds, which bumped a ship up against cranes, resulting in a fortnight-long closure less than a year after Durban hosted the UN climate summit.

What about the mitigation challenge associated with the port petrochem complex? According to the Academy of Science of SA's 2011 book about Durban, *Towards a Low Carbon City*, "The transport sector is pivotal to the transition to a low-carbon city... The top priority identified was the need to reduce the vehicle kilometers travelled in the road freight sector as this provided the greatest opportunity to simultaneously reduce emissions of Greenhouse Gases and traditional air pollutants."³⁴ The Transnet port petrochem complex will do the opposite, in part because for decades, Transnet sabotaged its own rail freight capacity, allowing road trucking to surge from 20 to 80 percent of container carriage. Yet, Transnet completely ignored such climate-related implications. Follow-up with officials in 2012 generated this reply: "The project will decrease the ship waiting and turnaround times, which will have a lower carbon impact". The consultants did not factor in the dynamic aspects of the

shipping system, meaning that if there is an increase in efficiency by reducing the ships' offshore wait, the result is to speed up the system as a whole, thus increasing carbon impact.

Economic irrationalities

Ironically, financing for the port petrochem project may ultimately be threatened by the project's inefficiency and lack of economic feasibility. The argument in favor of the port is mainly that jobs will be created and SA will have world class infrastructure for export-led growth. But rising capital intensity at Transnet along with trade-related de-industrialization may result in fewer manufactured exports as well as net employment loss, which has been the norm since 1994, when democracy also ushered in economic liberalization after SA joined the World Trade Organisation. The project only makes sense if one is locked into national boundaries established in Berlin during the colonial "Scramble for Africa" of 1885, the point at which borders were determined by white men representing imperial interests.

As the region's main port rail link to the largest market, Gauteng – and from there to the rest of the subcontinent – Durban is facing stiff competition from Maputo in Mozambique for shipments to Johannesburg, because it is a much less mountainous journey. In addition, there is container handling competition from other ports along the coast attempting to set up regional freight hubs and export processing zones. As it stands, at US\$1,080 per container, Durban's costs of processing freight are the highest in the world. Port advocates have been unable to explain how an

"The firm's consultants had not considered the impact of rising sea levels or extreme storms"

additional US\$25 billion in investments (no doubt much more, since recent trends could triple original estimates) will cut operating and maintenance costs to competitive levels. Repaying the principle, interest on the capital and all the additional costs will force much higher container handling charges, leaving the prospect of another white elephant. In Durban, similar projects that were anticipated to earn profits – such as the airport, convention centre and

32. *Ibid.*

33. Cornell University, "We have a planetary emergency: Hansen, leading NASA climate scientist, urges unions to act", New York City, October 23, 2012, http://www.ilr.cornell.edu/news/GLIJamesHansen_102312.html.

34. Academy of Science of SA, *Towards a Low Carbon City: Focus on Durban*, Pretoria, 2011, <http://www.assaf.org.za/2011/08/durban-on-a-pathway-towards-a-low-carbon-city/>.

marine entertainment complex – have all needed annual multi-million dollar taxpayer bailouts.

Conclusion

A very different strategic investment project would recognize the urgent need to detox South Durban, reboot the local economy towards more labor intensive, low-polluting industry, and add much more public transport, renewable energy, organic agriculture not reliant upon pesticides, a “zero-waste” philosophy and a new ethos of consumption. South Durban activists and the national Million Climate Jobs campaign want society to adopt this approach, but they remain on a collision course with Transnet, its financiers, the Treasury and Presidential Infrastructure Coordinating Commission, as well as the municipality. Unlike the Medupi campaign from February to April 2010, there is far more time for mobilization of pressure to halt Transnet's access to external financing, and hence the project itself.

4. Conclusion

What is the future of SA's strategy of mega-project development, as it is based on fossil fuels and on extremely dubious approaches such as those we have just examined?³⁵ In October 2012, at a Presidential Infrastructure Investment Conference in Johannesburg, Deputy Public Works Minister Jeremy Cronin admitted what is patently obvious in the neo-colonial SA economy: “Too much of our development has been plantation to port, mine to port.” Instead, we need “social infrastructure, such as water, hospitals, schools and housing, in order to prevent the kind of protests witnessed recently in the mining sector.”³⁶ Cronin's influence as minister notwithstanding, this rhetoric is probably just a case of “talk-left, invest-right”: in mega-projects like Medupi and South Durban's port sprawl, against the interests of people and planet, and on behalf of corporate profits. In these respects, there was

more continuity than change from the pre- to post-1994 eras. For many years, such mega-projects have dominated corporate investment, and these have always entailed very generous state subsidies, usually associated with mining (Free State Goldfields), smelters (Alusaf, Columbus) airports and ports (Richards Bay, Saldanha, Coega), mega dams (Gariep, Lesotho), coal fired power plants and other energy projects (Mossgas, Sasol oil-from-coal) and special projects (sports stadia and the Gautrain).

This means that there remains a formidable lobby for fossil fuel-based infrastructure investment in SA, ranging from mining houses to the construction industry. The elite mandate is to “mine more and faster and ship what we mine cheaper and faster”.³⁷ Behind this strategy is a long history of cheap energy supply for transnational capital made possible by the availability of large amounts of poor quality coal and an incestuous relationship between the coal mines, gold industry and Eskom. A history of state intervention in securing the energy needs of the mines, agriculture and industry established the principle of keeping electricity as cheap as possible for big capital.

The ANC government did not change this arrangement, which helps to explain why, at recent climate summits, it has defended the status quo – namely, rising emissions. The new government as co-opted by the minerals energy complex as the old regime was.³⁸ David McDonald notes that SA has “the world's largest reserves of platinum group metals (87.7 percent of world totals), manganese (80 percent), chromium (72.4 percent), gold (40.1 percent) and aluminosilicates (34.4 percent).”³⁹ Eskom fostered a debilitating dependence on the (declining) mining industry, leaving the country, according to the University of Cape Town Energy for Development Research Centre, “the most vulnerable fossil fuel exporting country in the world” if global climate regulations are finally adopted,⁴⁰ in part because, when corrected for income and population size, SA emissions

35. Pretoria's other multi-billion-rand carbon-intensive investments in recent years include SA Airways plane purchases – and subsequent multi-billion-rand annual bailouts – along with sports stadia widely acknowledged as white elephants by even Danny Jordaan, local host of the Fifa World Cup in 2010. Meanwhile, renewable energy is being rolled out very slowly – with some high visibility townships getting a few solar geysers but the country's world-class sunshine, wind and tidal potential going to waste (providing less than 5 percent of the country's power). In contrast, Shell received permission in 2013 to drill and frack the Karoo's fragile ecosystems.

36. CityPress, ‘Infrastructure roll out to cost R844 million’, 19 October 2012, <http://www.citypress.co.za/business/infrastructure-roll-out-to-cost-r844bn-20121019/>.

37. Peter Bruce, ‘Thick end of the wedge,’ *Business Day*, 13 February 2012.

38. Ben Fine and Zav Rustonjee, *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialization*, London, Christopher Hirst and Johannesburg, Wits Press, 2006.

39. David McDonald (Ed), *Electric Capitalism*, Cape Town, *Human Sciences Research Council Press*, 2008.

40. A. Spalding-Fecher, ‘The Sustainable Energy Watch Indicators 2001,’ Energy for Development Research Centre, University of Cape Town, Cape Town, 2000.

were higher than even the energy sector of the US, by a factor of twenty.⁴¹

In this context, SA often feels close to exploding, given the extreme dislocations and inequalities so well exemplified in the mega projects discussed above. The power relations that create these tensions are being strongly contested in work-places and communities. The protests are always local, but they also reflect the durable national level power relations. During the post-apartheid era, most South Africans suffered from neoliberal policies imposed by the governments of Nelson Mandela (1994–99), Thabo Mbeki (1999–2008), Kgalema Motlanthe (2008–09), and Jacob Zuma (2009–present). The results included an immediate rise in income inequality, with the Gini coefficient soaring from below 0.6 in 1994 to 0.72 by 2006 (0.8 if welfare spending is excluded).⁴² The official unemployment rate doubled from 16 percent in 1994 to around 32 percent by the early 2000s, and though the rate then fell, in 2009–10 another 1.3 million jobs were lost.⁴³ The longterm explanations for the unemployment crisis were increased imports in labor intensive sectors – mostly by ship through the Durban port (source of 60 percent of SA bound cargo) – and imported machines to exacerbate capital intensive production techniques.

In addition, ecological problems became far worse, according to the government's 2006 Environmental Outlook re-

"The protests are always local, but they also reflect the durable, national level power relations"

search report, which noted "a general decline in the state of the environment".⁴⁴ By 2012, SA's 'Environmental Performance Index' slipped to the 5th worst of 133 countries surveyed by Columbia and Yale University researchers.⁴⁵ For example, Gauteng, the country's main megalopolis, experienced water scarcity and water table pollution when the first

two Lesotho mega-dams were built during the late 1990s with World Bank financing. There were not only destructive environmental consequences downriver, but the costly cross- catchment water transfer to Johannesburg raised water prices, thus deterring consumption by poor people in low- income townships.

One result was the world's highest profile legal case of Third World development corruption in Lesotho. Another result was the upsurge of social protest; Africa's main "water war" – between Soweto residents and their municipal water supplier, the Paris-based company Suez (whose construction subsidiary was one of the firms prosecuted for corruption in Lesotho) in the early 2000s – can be traced to higher water prices and a commercialized system. Suburban water consumption was 30 times greater each day than in low income townships. Rural (black) women still stand in line for hours at communal taps in the parched, former Bantustan areas. This case was an important precedent, because when it comes to electricity, Medupi's financing costs are having a similar impact on affordability for low income black South Africans.

And similar biases affect health and welfare when it comes to the distribution of electricity. While BHP Billiton gets the world's cheapest energy for its aluminum smelters, millions of poor people are regularly disconnected from or denied access to the grid due to extreme poverty. Because of dirty household energy, the passage is often rapid from HIV positive to full blown AIDS status via respiratory related opportunistic infections, including the raging TB epidemic. These add to the existing set of occupational health diseases inherited from the mining-energy complex. The government's failure to prevent mining pollution, toxic dumping and incineration led to a nascent but portentous group of mass tort (class action) lawsuits. The victims included asbestos and silicosis sufferers who worked in or lived close to the country's mines, who in 2013 achieved a landmark victory. Other legal avenues, and social activism, were pursued by residents who suffered persistent pollution in extremely toxic industrial sites. In these efforts, the environmental justice movement invariably fought both corporations and Pretoria, which from 1994 downplayed ecological crimes.

41. International Energy Agency, "CO2 Emissions from Fuel Combustion, 1971-1998," Paris, 2000; International Energy Agency, "Key World Energy Statistics from the IEA," Paris, 2000.

42. Hilary Joffe, "Growth has helped richest and poorest", *Business Day*, March 5, 2008.

43. Geeta Kingdon and John Knight, "Unemployment in South Africa", Paper presented at the "10 year review of the South African Economy conference", Stellenbosch University, October 28–29, 2005, <http://www.csae.ox.ac.uk/resprogs/usam/default.html>.

44. See: <http://www.info.gov.za/speeches/2007/07062911151001.htm>.

45. Environmental Performance Index, <http://epi.yale.edu/>.

With this level of degradation, it is no surprise that there is such intense labor, social and environmental resistance. The 2012 and 2013 World Economic Forum Global Competitiveness Report placed SA in the world leading position for adverse employee-employer relations out of the 144 countries surveyed.⁴⁶ Typically, police record 10,000 protests each year.⁴⁷

Because attempts to change public policy have failed, thus far, one obvious new pressure point will be financing. What is at stake is whether common sense prevails over profits. That calculus has to be swung in the favor of the former, by reducing the latter, perhaps through the non-violent civil

disobedience pioneered in Durban in 1913 by Mahatma Gandhi and adopted by international anti-apartheid activists. The most powerful weapon was financial sanctions. Whether the World Bank and international lenders – including China and the coming BRICS Bank – can be forced to stop new tranches for Medupi and new Transnet financing is a matter of organizing prowess.

If organizing does intensify, it is the financing weaknesses of the two parastatal corporations that might make the mega-projects more difficult to deliver, given SA's vulnerabilities and excessive foreign debt. But that will be a matter for struggle.

46. World Economic Forum, *Global Competitiveness Report 2012–2013*, Davos, September 2012, <http://www.weforum.org/reports/global-competitiveness-report-2012-2013> and same document for 2013–14.

47. SAPA, "Cops handled 12,399 protests", *IOL News* September 19, 2013.

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Infrastructure: for people or for profit?, published by the Heinrich Böll Foundation and Latindadd, brings together several articles on investment in infrastructure projects, including public-private partnerships (PPPs). Using both a theoretical and an empirical lens, the themes of the book revolve around the dilemmas of risk and profitability of those investments.

There is no unnecessary infrastructure because the decision to install such works is usually due to citizen demand. Some infrastructure projects facilitate exports, while others are aimed at the domestic market, but infrastructure geared to exports also facilitates the movement of vehicles that transport persons and integrates regions.

From the perspective of the public interest, the question is not only how one can ensure the private sector's rate of return, but how the risk borne by the state is to be covered, as it is the financier of last resort. This concern is made explicit in at least two of the articles and should be the center of public and academic analyses.

Oscar Ugarteche

This timely volume refers to one of the most important “rediscoveries” of recent years: the essential role of infrastructure in economic development, and in particular, its impact on productivity and the standard of living.

The articles in this volume contribute to an important debate as they reflect mounting concerns over this growth paradigm. While the debate applies across the board to all forms of infrastructure, the emphasis chosen in this book is on energy infrastructure. While it is representative of issues that arise in other sectors, the energy sector may best reflect some of the dilemmas posed.

The analyses and case studies in this publication are a necessary and timely appeal to reconsider the nature and direction of the infrastructure paradigm that is needed for this century. The authors remind us that it will be essential to have laws and regulations that implement principles of responsible investment in infrastructure (including in the areas of human rights, gender and environment). These laws and regulations should help realize the commitment to democratic, participatory and accountable governance.

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