



WWF

BRIEF

2016

HARNESSING THE POWER OF RENEWABLE ENERGY AND ENERGY EFFICIENCY FOR A CLEANER, HEALTHIER AND MORE PROSPEROUS GREATER MEKONG REGION

Today, the power sectors in the Greater Mekong (Viet Nam, Thailand, Myanmar, Lao PDR and Cambodia) are mainly dependent on hydropower, gas, coal and electricity imports. The different countries' power development plan share at least one point in common: electricity consumption will grow drastically and the electricity mix will remain similar, based mainly on fossil fuels and hydro power. These technologies have a high economic, environmental and social cost. **Another pathway is possible.**

Greater Mekong countries have an opportunity to become leaders in clean, renewable electricity. Renewable energy sources such as sun, wind, water, biomass, and ocean energy abound. Decreasing costs of wind and solar plants have made them competitive with gas, nuclear and coal power plants in many countries. Typically, wind projects and especially solar photovoltaic (PV) require less time to build than fossil, large scale hydro or nuclear power plants. With that in mind, WWF and partners have developed a "Power Sector Vision – Toward 100 Percent Renewable Energy by 2050" for the Greater Mekong and for each country individually. The study answers some key questions: *Can the region achieve a secure, sustainable power sector for all by 2050? Can there be a shift away from plans based mainly on polluting fossil fuels and large hydropower? Can the region develop an energy efficient power sector built around clean and inexhaustible renewable energy?*

**100%
POSSIBLE**

WWF worked with Intelligent Energy Systems (IES), with support from several partners to develop the most ambitious and detailed analysis of its kind to date in the region. It includes five country reports and one regional report, highlighting cross-border issues such as electricity exchanges.

SUSTAINABLE ENERGY SCENARIO AND ADVANCED SUSTAINABLE ENERGY SCENARIO

These scenarios demonstrate that it is technically and economically feasible to supply everyone in 2050 with the electricity they need, with at least 86 percent coming from renewable sources.

- Less than 11% of energy from large hydropower
- Carbon emissions reduced by 85 - 100%
- 2050: 80 - 100% is produced from renewables, with each country producing at least 80 - 90% of its own energy (some become energy exporters)

BUSINESS AS USUAL

The Business as Usual (BAU) scenario models the region's current power sector development plans.

- Prioritizes fossil fuel power generation
- By 2050, 65% of the electricity produced with imported energy sources like gas or coal

In other words, by using renewable energy reasonably and tapping the region's large energy efficiency potential, it is possible to:

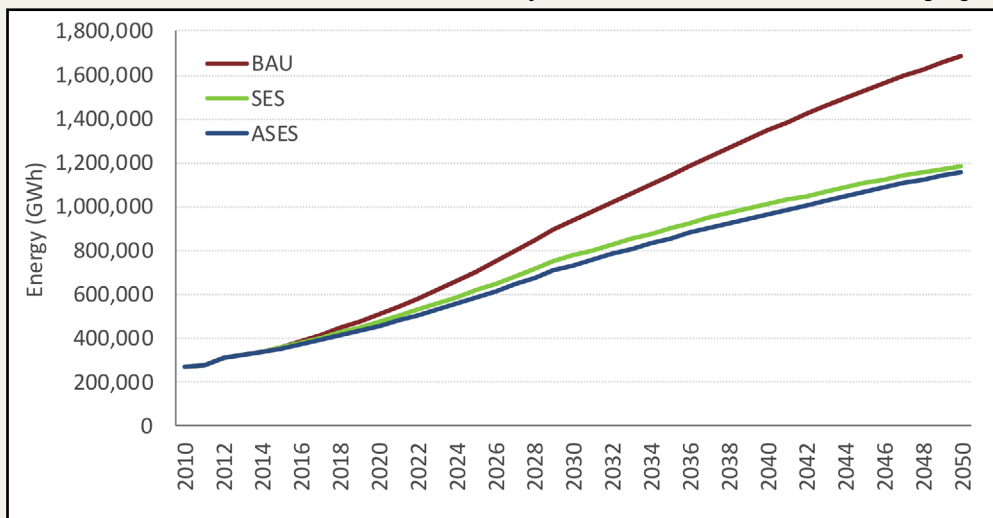
- Very significantly reduce the Greater Mekong's dependence on fossil fuel or future uranium imports,
- Ensure stable electricity prices for decades to come
- Increase job creation
- Increase positive cooperation in the region, and
- Reduce environmental and social impacts.

A sustainable high renewable energy uptake approach can ensure electricity cost stability and maintain system security – that is, provide enough electricity at all times to make sure there's never a risk of the 'lights going out'. The sustainable energy scenarios are 100% possible: they rely on realistic projections for proven technologies, and are economically competitive with "business as usual".

2050: KEY RENEWABLE ENERGIES & ECONOMICS

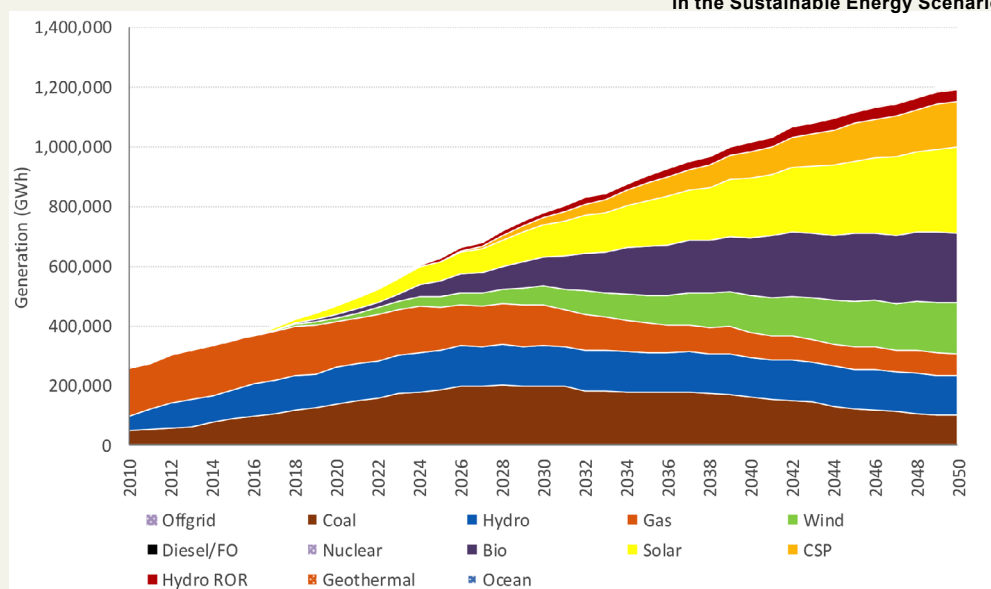
Energy efficiency is a crucial component of our vision. It enables the Greater Mekong to decrease its energy use relative to business as usual, saving about 30% of electricity demand by 2050 (Figure 1). To do so, the region only needs to gradually improve to catch up with the countries in Asia leading in energy efficiency in the industrial, commercial and residential sectors.

FIGURE 1: Electricity demand forecasts for the Greater Mekong region



The remaining demand, after those efficiency efforts, would be satisfied through several different renewable energy sources (Figure 2). The quickly decreasing costs of solar photovoltaic and batteries make those technologies a crucial part of the future energy mix. Other important technologies include wind and biomass/biogas. Some natural gas and coal remains in the system until 2050, as the power plants being built today will continue to operate until 2050. Shortly after 2050, it would be technically and financially compelling to also replace these power plants with renewable energy. The Advanced Sustainable Energy Scenario goes even further and suggests that gas and coal power plants could be decommissioned before their end of life to achieve 100% renewable energy by 2050.

FIGURE 2: Greater Mekong future electricity generation mix until 2050 in the Sustainable Energy Scenario



The sustainable energy scenarios (SES and ASES) provide cheaper electricity than business as usual.

**\$15 BN
SAVINGS FROM
SUSTAINABLE
ENERGY**

The cost of energy per kilowatt-hour, including the costs of building and operating the power generation plants, is **less** under the sustainable energy scenarios than under business as usual. (See the levelised cost of electricity, Figure 3). Although the business as usual scenario needs fewer investments in capital costs, the sustainable energy scenarios more than make up for their higher capital costs through savings in operating costs thanks to less consumption of costly fuel (See net present values, Figure 4). In fact, the Greater Mekong could be saving around 40 billion USD per year around 2050 by opting for a sustainable power sector based on renewable energy and efficiency.

Figure 3 Levelised Cost of Electricity (LCOE) for the 3 scenarios

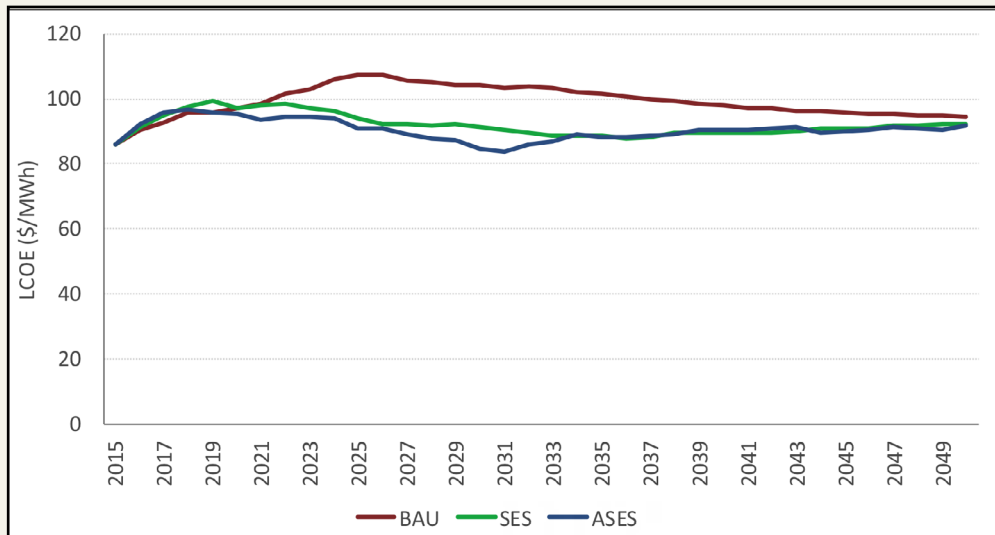
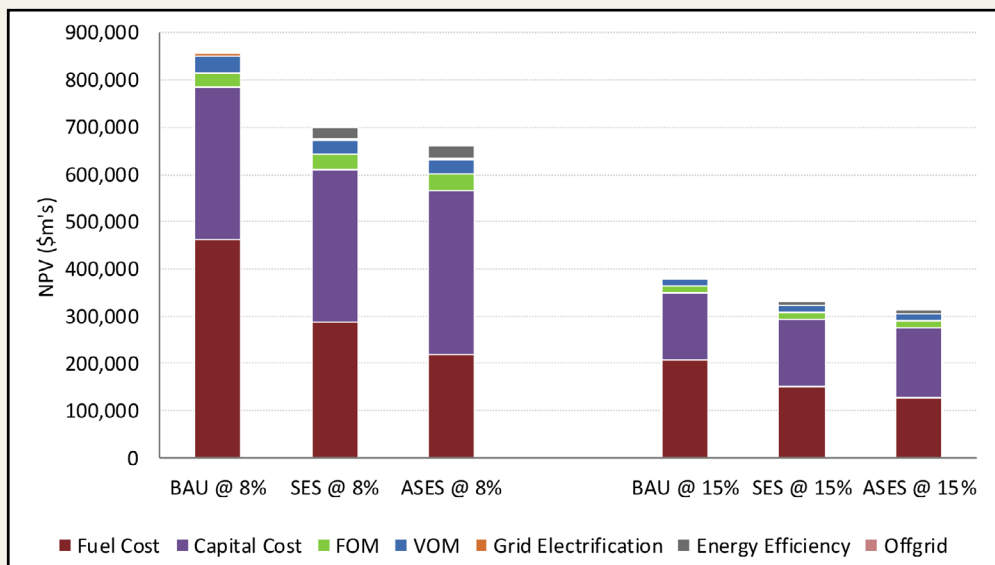


FIGURE 4: Net Present Value (NPV) for the three scenarios with a discount rate of 8% and 15%



THE WAY FORWARD

COP21, in December 2015, in Paris confirmed the global appetite for avoiding addressing catastrophic climate change. That the world faces an energy crisis is beyond doubt.

There's a pressing need to secure a sustainable energy supply as demand for fossil fuels and hydro power outstrips environmentally and economically sustainable supply. Sustainable energy access for poor communities would also benefit from an increased development of solar and other sustainable energy sources.

We – individuals, communities, businesses, investors, politicians – must act immediately, and boldly. Half-hearted solutions are not enough. We must aim for a fully renewable and sustainable energy supply as a matter of urgency.

The transition to a fully sustainable power sector will require many steps. We should stop the development of new fossil fuel or nuclear power plants, and instead focus on sustainable renewable energy plants. Electricity demand growth should be reduced through indepth energy efficiency measures across industry, services, households, and transport. Both for efficiency and renewables, appropriate financial measures will be key to secure support from households and the private sector. Cooperation with neighbouring countries to exchange sustainable electricity across borders will be crucial.

A sustainable energy supply is possible. The Power Sector Vision report lays out, in unprecedented detail, one way that we can do this. It isn't the definitive solution, and it isn't perfect: it raises many challenges and difficult questions. The modelling shows that solutions are at hand. The scenarios are presented to catalyze debate and to spur the region to action.

We now need to respond to the issues it raises. We need to take it further. But most of all, we need to act on it – each and every one of us. **Starting today.**



**A SUSTAINABLE ENERGY
FUTURE IS POSSIBLE
IF WE ACT NOW**

WWF'S POWER SECTOR VISION

37 - 43%

of generation from solar energy (photovoltaic and concentrated solar) by 2050

85-100%

CO₂ equivalent savings in the power sector by 2050



30%

less electricity consumption compared to business as usual by 2050

\$40 BILLION

savings per year by 2050 from switching to sustainable energy



READ FULL REPORT

PANDA.ORG/WWFGREATERMEEKONG/ENERGYVISION
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Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

wwf.or.th

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