



CARBON-FREE ENERGY DEVELOPMENT NETWORK

IN SOUTHEAST ASIA

By creating a carbon-free energy development network, a moderating unit designed as a regional focal point will be established in order to identify synergies on combining or aligning national activities. Sharing successful activities with member organisations will scale up successful actions and activities. The aim is to slow down coal development, reduce regional energy dependency and a financial log in into coal capacity for Southeast Asia.

"If the entire region implements the coal-based plans right now, I think we are finished."

Jim Yong Kim,
President of the World Bank





GreenID works to promote sustainable development in Vietnam and the larger Mekong region, and is now on its way to become a leading and credible civil society organization promoting sustainable energy sector development.

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EXECUTIVE SUMMARY

The nations of SEA stand at a crossroad in terms of their collective energy future. Over the next decade, the region will experience rapid economic growth and a 50% rise in energy demand. With this growth will come challenges, as the region strives to supply energy affordably, sustainably and securely. The region will see a 4% annual growth in primary energy demand until 2025, amounting to a rise of 50% over 2014 levels. Besides primary energy, electricity demand will double between 2014 and 2025.¹ The region has insufficient indigenous fossil fuel resources to meet its growing energy demand, and the share of imported fossil fuel will increase, which has important energy security implications.

The year 2016 has seen record low prices for utility-scale solar photovoltaics (PV) and onshore wind, as low as USD 0.05 per kilowatt-hour (kWh) for the lowest-cost project proposals.² More and more countries are showing how significant shares of variable renewables can be integrated into existing grids, while maintaining or even improving power reliability and quality. With the Paris Agreement coming into effect, this shifting energy landscape also comes at an important time for the climate. The shared objective to keep

climate change well below 2 degrees celsius implies a global decarbonized energy system between 2050 and 2070. “The world is in a race against time. The single most important thing we could do to reduce CO2 emissions quickly and cost-effectively, is phase-out coal and speed up investments in energy efficiency and renewable energy. When China announced in January that it was cancelling more than 100 coal plants currently in development, they set an example for governments everywhere: change happens quickly when governments act – by establishing clear, long-term policy and financial signals and incentives.”³

So far, there is a lack in sharing, coordinating and addressing the national successes and knowledge of CSO activities on energy issues at regional level. This gap between the international coal strategy as well as the national strategies will be closed by the network increasing the regional coordination, actions and joined activities on coal development in SEA. Furthermore, the findings, activities and lessons learned of like-minded Civil Society Organisations (CSOs) will be distributed and used in a structured way among the region.

1 IRENA & ACE (2016). *Renewable Energy Outlook for ASEAN: a REmap Analysis*. International Renewable Energy Agency (IRENA), Abu Dhabi and ASEAN Centre for Energy (ACE), Jakarta

2 Recent deals in Denmark, Egypt, India, Mexico, Peru and the United Arab Emirates saw renewable electricity being delivered at USD 0.05 per kilowatt-hour or less

3 Christine Lins, Executive Secretary of REN21

EXECUTIVE SUMMARY

Furthermore, from a global perspective, SEA is not fully recognized as the new hotspot for coal development, and in many cases, this is not covered in international reports or studies. It is high time to facilitate efforts beyond national borders to address regional challenges caused by massive coal development in SEA.

The Carbon-free Energy Development Network in SEA will support national efforts to ensure the greater goal to reduce coal dependency, slowing down investments in coal and covering the regions' need for energy with clean and sustainable sources. It will be strongly linked to existing national, regional and global activities to ensure an effective use of resources.

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STATUS QUO OF ENERGY DEVELOPMENT IN SOUTHEAST ASIA

The population of the ASEAN region will increase from around 615 million in 2014 to 715 million by 2025. The economy will grow more than 5% per year, resulting in a rapid rise in energy demand. The region will see 4% annual growth in energy demand until 2025, amounting to a rise of 50% over 2014 levels. Furthermore, electricity demand will double between 2014 and 2025. The region has insufficient indigenous fossil fuel resources to meet its growing energy demand, and the share of imported fossil fuel will increase, which has important energy security implications. However, emerging Asia is expected to account for an increasingly large share of the future energy demand. The large increase in fossil fuel use indicated in these projections confirms the region's hunger for energy and illustrates the need for policy that promotes alternative energies. Most member states have set targets for renewable energy technologies and have implemented measures to encourage their development, though challenges remain in making these policies effective and efficient. In addition, financing renewables, which often have relatively large upfront costs, requires diverse sources of investment. Private investment can be one source of finance that can also create jobs and facilitate technological diffusion.¹

1 http://www.keepeek.com/Digital-Asset-Management/oced/development/economic-outlook-for-southeast-asia-china-and-india-2017_saeo-2017-en#page17

In recent decades, Southeast Asia's (SEA) energy policies have primarily focused on increasing electricity production, investment in fossil fuel-fired power plants (coal, gas, and oil), and large-scale hydropower projects to meet the rising demand and the significantly increased share of electricity access. This power development has come at a high cost for local communities and the environment. In areas near power plants, citizens and the local economy have been impacted negatively by water and dust pollution. At the same time, most power plants reduce the livelihood and business opportunities for local communities and the economy.

SEA is very vulnerable to the future impact of climate change. A study by Asian Development Bank (ADB) projects that an average increase of 4.8 degrees Celsius could result in a sea level rise of 70 centimeters by 2100 in Indonesia, the Philippines, Thailand and Vietnam, causing major problems for many of ASEAN's largest coastal cities, such as Jakarta, Bangkok, Manila, as well as the Mekong Delta including Ho Chi Minh City which is one of the biggest areas of food production in the region. Projections of economic losses by the ADB study include a decline up to 50 percent of rice yield potential by 2100 and a loss of 6.7 percent of combined gross domestic product (GDP) each year by 2100. Because of the necessity to mitigate climate change, which already shows drastic consequences in SEA, there is increasing pressure

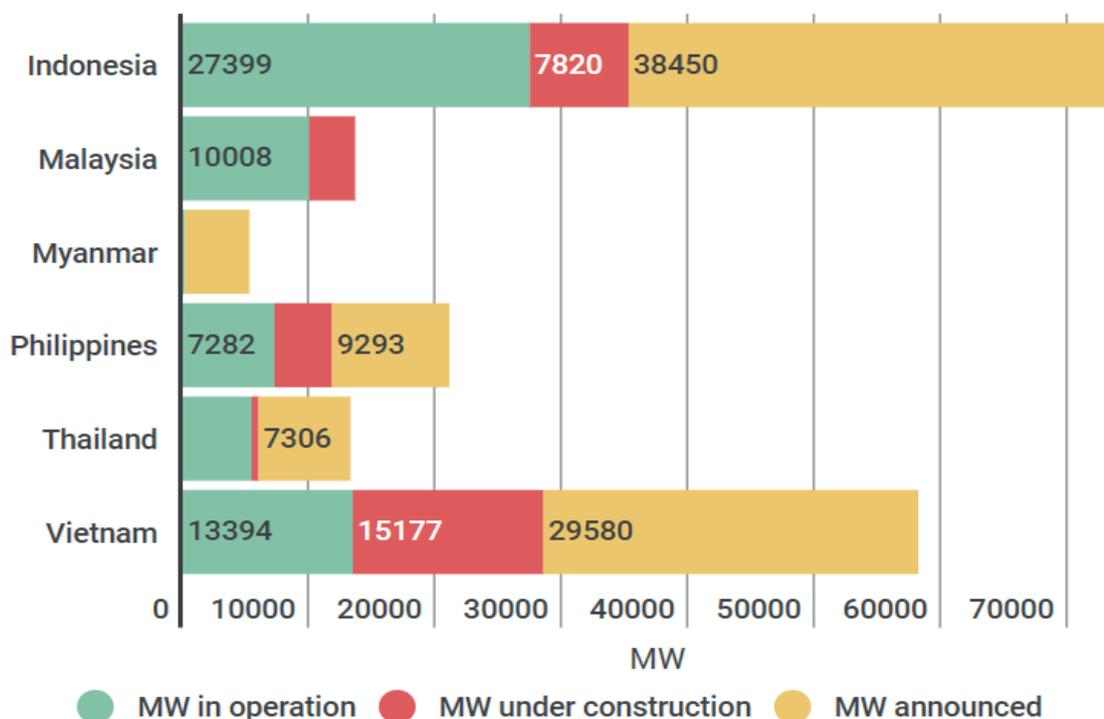
STATUS QUO OF ENERGY DEVELOPMENT IN SOUTHEAST ASIA

worldwide to reduce greenhouse gas emissions, especially from the energy sector: governments from almost all countries agreed to limit global warming to between 1.5 and 2 degrees Celsius in the landmark decision of the Paris Agreement in 2015. At the same time, international investors are pulling out funds from fossil fuels, while investment in renewable energies is skyrocketing.

All ASEAN countries are parties to the United Nations Framework Convention on Climate

Change (UNFCCC), and have submitted their National Determined Contributions (NDCs) in support of the 2015 Paris Agreement. Three member countries of ASEAN, Cambodia, the Philippines and Vietnam, are part of the Climate Vulnerable Forum, an international partnership of countries highly vulnerable to the warming planet. The Forum advocated for ambitious actions such as the call for a 1.5-degree global temperature increase goal, full decarbonization, and 100% renewable energy systems by 2050.

COAL CAPACITY IN SOUTHEAST ASIA

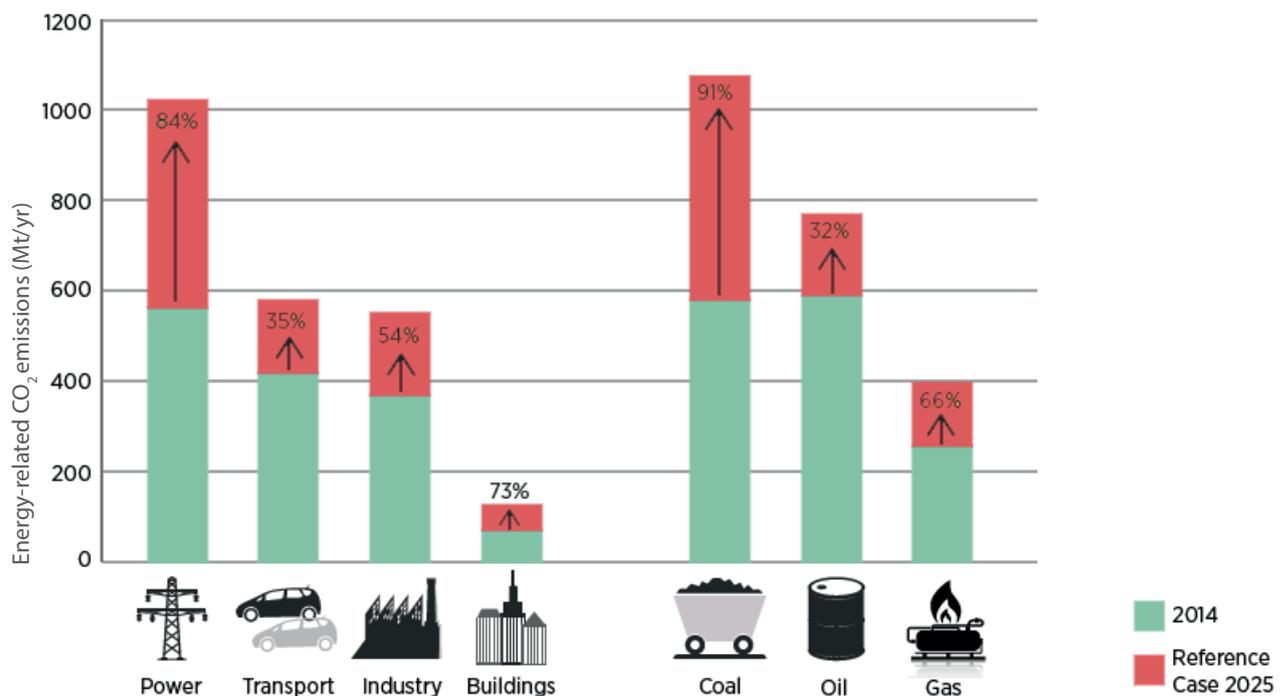


Data: <http://endcoal.org/global-coal-plant-tracker/summary-statistics/>

Contrary to the upcoming risks of climate change, the international INDC commitments and a 100% renewable energy system by 2020, the region is standing for 15% of the total global coal expansion with 124 gigawatt (GW) new coal-powered energy in the pipeline. Even though clean energy technology was not identified as playing a big role in additional generation capacity, the need to shift towards clean energy is on the agenda of key decision makers including governments, the industry and other relevant stakeholders.

In SEA, there are 266 coal-fired power plants with an installed capacity of 66 megawatt (MW) in operation emitting around 291 million tons of carbon dioxide (CO₂) on an annual basis. Putting it into a global perspective, only 3% of the worldwide installed capacity is located in SEA, which accounts for 4% of the global coal emissions. As this situation poses a challenge to shift the region towards a carbon-free power sector, the next few years will be a crucial period. Yet, taking a localized, short-term approach

ASEAN'S ENERGY-RELATED CO₂ EMISSIONS BY SECTOR AND FUEL



Source: IRENA & ACE (2016)

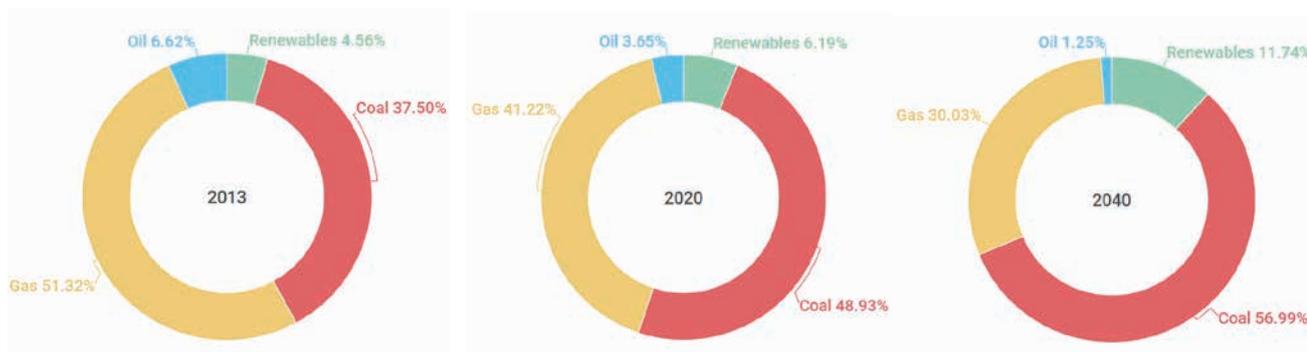
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to power planning runs the risk of perpetuating a reliance on coal-fired generation that may potentially extend far beyond the point at which low-carbon technologies present a viable and highly profitable alternative. Most reasonably, maintained coal-fired power plants can run for a lifetime of around 40 years, and longer with upgrades. The existing coal fleet in SEA is still relatively young, and many newly planned coal plants will start operating in the next five to ten years. This proceeding, together with the trend of unabated coal-heavy power development to fulfill electrification targets, could result in the long-term lock-in of high levels of carbon dioxide (CO₂) emissions or the prospect of early retirements of profitable assets.²

Therefore, it is essential to support the key decision makers, politicians and the private sector to change the generation mix towards renewable energy for the good of the economy, citizens' livelihood and health. It is important to convince investors not to invest in coal, a technology that might be obsolete within the next few decades.

² IEA (2016), <https://www.iea.org/publications/insights/insightpublications/ReducingEmissionsfromFossilFiredGeneration.pdf>

ELECTRICITY GENERATION BY FUEL IN SOUTHEAST ASIA



Data: IRENA & ACE (2016)

THE FUTURE CHALLENGES OF SOUTHEAST ASIA'S CONTINUED INVESTMENT IN COAL

IEA notes that SEA will remain one of the most rapidly growing regions in the period up to 2040, with its share of global GDP rising from 5.9% to 7.7%. At this level, General Electric Power Strategy and Growth estimates that regions with ~220 GW of power generation capacity are expected to increase to ~160GW or by ~70% over the next decade. This rapid growth is reinforced by domestic policies encouraging more investments in coal, and trade policies between and among ASEAN countries, not to mention trade and investment agreements between ASEAN and other countries, such as China, Japan and South Korea.¹

The official national power development plans for SEA are mostly focused on increasing coal capacity in the near future. The countries of Indonesia, Vietnam, the Philippines, Thailand, Malaysia and Myanmar account for 97% of the current fleet and 99% of new build units. Furthermore, they are planning to add the most significant coal generation capacity in SEA over the next decade. By the end of 2016, Indonesia, Vietnam, the Philippines, Thailand, Malaysia and Myanmar had a combined coal-fired capacity of 64 GW, another 32 GW were under construction and a coal-fired capacity of more than 89 GW had been announced.

The region has insufficient indigenous fossil fuel resources to meet its growing energy demand and an increasing share of imported fossil fuel, which has important energy security implications. Rising fossil fuel demand will mean a significant growth of both air pollution levels and CO₂ emissions. According to an International Renewable Energy Agency (IRENA) reference case, CO₂ emissions from power generation will increase by 84% – one of the highest growth rates worldwide. Total energy-related CO₂ emissions will be around 2.2 gigatons (Gt) annually by 2025, or just above 5% of total global CO₂ emissions. External costs related to air pollution from the combustion of fossil fuels will increase by 35% from an average of USD 167 billion annually in 2014, to an average of USD 225 billion annually by 2025. This would equal around 5% of ASEAN's GDP in 2025.

Fossil fuels will make up the largest share of the increase in ASEAN's energy demand by 2025.

"The science is very clear, there is no space for any new coal."

Christiana Figueres,
Former Executive Secretary of
the United Nations Framework
Convention on Climate Change
(UNFCCC)

¹ Decarbonizing Southeast Asia ICN ASEAN 50th Intervention

FUTURE CHALLENGES OF SOUTHEAST ASIA CONTINUING INVESTING IN COAL

This means energy security will remain a major concern across the region, as mentioned in most countries' energy plans. All countries have emphasized the importance of diversifying their energy mix, ensuring the sustainability and diversity of imports, and finding ways to meet the rising demand with indigenous resources. Recent analysis shows the depletion of natural gas reserves in around the year 2025. Accordingly, it is expected that the region will become a net gas importer between 2020 and 2030. Even the large coal reserves in some countries will be reduced by around 60%²². In this context, renewable energy is a way to increase the region's energy security through greater diversification of the energy mix and by reducing demand for fossil fuel imports.

2 IRENA & ACE, 2016

DEVELOPMENT OF AIR POLLUTION IN SEA

Based on a study conducted by Harvard University¹, the emission from coal in the region will be tripled with the coal-fired power plants that are planned or already under construction. The largest increases will occur in Indonesia and Vietnam.

Simulations with the GEOS-Chem chemical transport model show large resulting increases in surface air pollution, up to 11 $\mu\text{g m}^{-3}$ for annual mean fine particulate matter (PM_{2.5}) in northern Vietnam and up to 15 ppb for seasonal maximum 1 h ozone in Indonesia. According to the study, it is estimated that 19 880 (11 400–28 400) excess deaths per year from SEA coal emissions at present, increasing to 69 660 (40 080–126 710) by 2030. Indonesia and Vietnam together will account for 67% of the total increase. Indonesia is planning 176 new coal plants by 2030, 75 of which are already under construction, and it has relatively lax emission standards.

Myanmar shows the highest relative increase in emissions by 2030, becoming the third largest emitter after contributing almost no emissions in the present day.

1

Burden of disease from rising coal-fired power plant emissions in Southeast Asia; Shannon N. Kopplitz, Daniel J. Jacob, Melissa P. Sulprizio, Lauri Myllyvirta, and Colleen Reid

OPPORTUNITIES TO MOVE TOWARDS LOW CARBON ENERGY SOURCES

Globally, renewable power capacity set new records. In 2016, 161 GW are installed, increasing the total global capacity by almost 9% over 2015, to almost 2,017 GW. Solar PV accounted for around 47% of the capacity added, followed by wind power at 34%. Even though hydropower has a questionable role and is discussed quite critical among Mekong countries it still stands for 15.5% of global added capacity in 2016.¹ The ASEAN region has abundant renewable energy resources. Solar irradiance – power from the sun – in the region is very strong, averaging over 1,500-2,000 kilowatt hours (kWh) per square meter annually. Wind resources are more modest, but there are regions along the coast and inland in Vietnam, Thailand, Indonesia and Myanmar with reasonable wind speed. Furthermore, the industry is more and more working on wind turbines designed for lower wind speed accompanied with an increase of constant energy production. Some countries, namely Indonesia and the Philippines, have significant geothermal potential – some of the best in the world. Finally, bioenergy supply potential is very large across the entire region.² Furthermore, a shift of financial resources into RE research might increase the potential for the region and tailor made solutions.

This would be based on the specific framework conditions and would make use of the latest international technical innovations such as wind turbines, which are optimized to slower wind speeds.

Governments must consider the potential for energy efficiency and the mix of fuels and technologies that, in the long run, will best achieve the energy security, economic development and environmental protection which they are striving towards. Network and demand-side efficiency would lead to reduced consumption of all fuel types. Strengthening the grid network would permit the existing capacity to be used most effectively. Given the declining costs, the deployment of renewable energy technologies must be accelerated. Governments have a pivotal role in incentivizing the transition to low-carbon generation by creating an enabling environment.³

1 REN21 (2017)
2 IRENA & ACE (2016)

3 IEA (2016)



THE ROLE OF A REGIONAL NETWORK/PLATFORM

The aim of the network is to slow down coal development, reduce regional energy dependency and a financial log in into coal capacity for SEA by aligning the existing national organisations and actions on a regional level as well as creating a powerful and fact-based platform following a bottom-up approach. By establishing a platform, the regional exchange and support will increase the effectiveness of national efforts and strengthen the international fossil free and decarbonization movement in the region.

So far, there is a lack in sharing, coordinating and addressing the national successes and knowledge of CSO activities on energy issues at regional level. This gap between the international coal strategy as well as the national strategies will be closed by the network increasing the regional coordination, actions and joined activities on coal development in SEA. Furthermore, the findings, activities and lessons learned of like-minded CSOs will be distributed and used in a structured way among the region. The action and strategy of the new network will be strongly linked and in line with the international coal movement and its strategy. It will focus on the regional level and support the International Coal Network (ICN) by following a bottom-up approach to ensure an even stronger linkage of national organisations and campaigns. Therefore, more regional efforts and joint action are needed to reduce the increase of coal-fired

generation capacity in the region and worldwide. The goals are to build on already active and united CSOs in the most affected coal countries that account for 90% of installed capacity and units under construction (Indonesia, Myanmar, the Philippines, Thailand and Vietnam), as well as to create a regional alliance and CSO platform for joint actions¹. The efforts of national civil society will be replicated on a regional level and will increase the pressure for key decision makers around the region. As the Carbon-Free Energy Development Network represents likeminded CSOs, it is planned as an accelerating unit with the main task of supporting national actions. The target groups of the network will be national governments and key decision makers throughout national partner organisations.

By pooling resources, a more powerful moderating unit can be designed as a regional focal point that will support existing structures and help to identify synergies of combined or aligned national activities. Even though the exchange will happen on a regional level, the main goal is to support regional CSO cooperation on energy transition from coal towards renewable energy. The second pillar targeting regional policy and

ASEAN energy policy will be strengthened by already established structures and supported by

¹ The Working Group on Energy and Climate (founded in April 2017) will be used as an entrance point and cooperation potential will be defined.

the collective alliances and networks. This will be achieved by following the three main objectives:

1. Accelerating the existing regional exchange of likeminded CSOs by working together and creating a platform;
2. Structuring the different national efforts and feed it back into the partner network and facilitating the regional advocacy work on energy transition;
3. Supporting the national campaigns towards renewable energy with regional studies and papers.

The Carbon-Free Energy Development Network is designed as a participative unit and is ideally linked to the working group (WG) on Energy and Climate by additional members to ensure the coverage of all relevant countries. It will support the national efforts to ensure the greater goal to reduce coal dependency, slow down investments in coal and satisfy the regions' need for energy with clean and sustainable sources. It will be strongly linked to existing regional activities to ensure an effective use of resources. This will also connect the dots among networks with a specific focus on energy issues. The aim still remains of transitioning to clean and sustainable energy development. All further details with regard to target groups, the scope of work and the modes of cooperation will be defined in the first meeting.

STRATEGIC FOCUS

(2017 and forward)

After establishing a network among Indonesia, Myanmar, Philippines, Thailand and Vietnam the strategy and approaches will be defined at the end of 2017.

1. Strong link to international coal strategy following a bottom-up support from regional level.
2. Sharing successful activities and campaigns among the region.
3. National civil society efforts will be replicated on a regional level and will increase the pressure for key decision makers around the region. The network will connect like-minded CSOs and will function as an regional accelerating unit.
4. The network might be extended to other countries in the region as well as organisation representing the main coal financing countries to ensure the full coverage of the coal value chain.

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Hanoi, August 2017



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