Myanmar’s Energy Challenge: Drivers, Outlook and Policy Options

ဴမန္မာႎိုင္ငံ၏ စၾမ္းအင္အခက္အခဲမဵား - တၾန္းအားေပးသည့္ အရာမဵား၊ ရႁဴမင္သံုးသပ္ခဵက္ႎႀင့္ မူဝၝဒအတၾက္ ေရၾးခဵယ္ႎိႀင့္ မူဝၝဒေရးရာ ေရၾးခဵယ္ေဆာင္ရၾက္စရာမဵားႎႀင့္ 

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Sponsored by the Programme on Modern Burmese Studies at St Antony’s College and the International Gender Studies Centre at Lady Margaret Hall, University of Oxford
Myanmar has taken another important step toward democratization, following the 2015 election victory of the National League for Democracy (NLD), led by Daw Aung San Suu Kyi. But decades of military repression, ethnic conflicts, political exclusion, abuse of natural resources and the environment, neglect of health, education, and infrastructure, and mismanagement of the economy, have left serious challenges for this new government.

On Monday 15 February, 2016, the Programme on Modern Burmese Studies at St Antony’s College and the International Gender Studies Centre at Lady Margaret Hall convened a workshop entitled “Towards Democracy and Reconciliation: Challenges Facing Myanmar’s Incoming Government.” Co-organized by Dr Daw Khin Mar Mar Kyi and Dr Matthew J Walton, the workshop brought together over a dozen UK experts on Myanmar, drawn from academic, advocacy, and activist communities.

Presenters focused on the challenges facing the new NLD-led government, identifying key stakeholders, persistent and emerging impediments, and potential policy responses. Subjects considered included military legacies, governance concerns, social issues, land and resource management, and conflict and displacement.

With the success of the event, the co-organizers saw an opportunity to effectively channel the insights of the participants into policy-making conversations in Myanmar’s government, civil society, and other political institutions. They also sought to contribute to the developing public discourse on political reform in the country. Participants were asked to transform their presentations into short policy briefs that could be of use to ministries, parliament, and other decision-making bodies in Myanmar. The collected briefs were edited by the co-organizers and translated into Burmese.

Please note that the views and positions presented in these briefs represent the authors and are not necessarily the views of the Programme on Modern Burmese Studies, St Antony’s College, the International Gender Studies Centre, Lady Margaret Hall, or the University of Oxford. In some cases, the views of different authors may diverge or conflict. We believe that including multiple different perspectives in a collection of policy briefs is valuable in fostering public debate in Myanmar.

We intend for this to become a regular event and policy brief series, which can draw on existing expertise among those studying Myanmar, including increasing numbers of scholars and advocates from the country. These and future briefs will be available electronically at the Programme on Modern Burmese Studies website (www.sant.ox.ac.uk/research-centres/programme-modern-burmese-studies) and the Oxford Feminist E-Press (theoxfordfeministepress.wordpress.com/). Please feel free to contact us with any questions or feedback.

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မွေးအစောပိုင်အားအဆွဲခန်းဌာနကို အကြောင်းပြချက်နှင့် အဆောက်အဦမှာ NLD နှင့် အဖွဲ့အဝင်များတွင် ထိုသိားပြီး သို့မဟုတ် အစိုးရမှ အလုပ်လုပ်ပြီး အာရုံစိုက်လိုသည်။

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Myanmar’s Moment

Myanmar is on the rise with the country’s transition launching an exceptional economic recovery. Exports have increased by 70 percent from 2010 to 2014, foreign direct investments (FDI) quintupled to USD 5 billion over the same period. More than three million tourists visited the country in 2014, compared to only 800,000 in 2010. The Economist even selected Myanmar as ‘Our Country of the Year’ in 2015.

Yet many in the country have yet to benefit from these developments and bullish measures will need to be undertaken for Myanmar to deliver on its momentum for the entire population. Indeed, Myanmar still has a long journey ahead regarding its economic development. In the 1950s, Myanmar’s GDP-per-capita was comparable to Indonesia or Thailand. Indonesia’s GDP-per-capita is now three times greater than Myanmar’s, Thailand’s five times. The percentage of population with access to electricity is a particularly telling indicator regarding a country’s stage of development. Almost 70 percent of Myanmar’s population has yet to access reliable and affordable electricity.

If Myanmar is managed well, the country may still transform at unprecedented scale in the coming years. According to expert projections, Myanmar could quadruple the size of its economy by 2030, from USD 45 billion in 2010 to more than USD 200 billion. The country’s consuming class could grow more than six-fold to around 19 million. Universal access to electricity may also be accomplished by 2030.

Cornerstones of a Sustainable Energy Scenario

Booming economies result in a significant rise in a country’s energy demand. In order to maintain its momentum, Myanmar must undertake massive investments in its energy sector in the coming years. Myanmar’s 2016 installed capacity stands at 4.9 GW. The many power outages across the country are evidence that demand frequently outstrips supply. 48% of the population still lack access to electricity. Hence, massive investments in Myanmar’s energy sector are urgently needed today already as well as in the future. According to the most conservative estimates of Myanmar’s Ministry of Electric Power, an installed capacity of 9.1 GW will be needed to meet the country’s 2030 demand, a capacity 85% greater than today. Authorities even suggested that up to 24 GW of installed capacity may be needed by 2030.

Myanmar is rich in natural energy resources and would thus be able to meet the various demand projections. Many investors are already aware of Myanmar’s hydropower and natural gas potential. Myanmar’s economically feasible hydropower potential stands at 46 GW, the largest potential in the region. Furthermore, the country has 90 trillion cubic feet of gas reserves, the 10th largest in the world. Yet Myanmar’s wind and solar potential must also be considered. The key reason is the speed of deployment for these technologies.

Myanmar’s energy demand is immediate. A focus on novel renewable technologies such as wind and solar may be particularly advantageous since many of these can be deployed almost immediately. For instance, a 50 MW wind farm can be built in only six months. A 1 MW solar photovoltaic (PV) project can be completed in less than one month. Meanwhile, the construction of a large dam takes 8.6 years on average. The construction of a natural gas (combined-cycle) plant takes approximately 3 years.

Wind is at the experimental and research stage in Myanmar, with only four wind turbines currently operational in the country. These include the 1.2 kW turbine installed at the Technological University in Shwetharlyoung.

Mountain (Kyaukse), a 3kW wind project at Dattaw Mountain (also Kyaukse) and another 1.2 kW turbine at the Government Technical High School (Ahmar) and 500 kW turbine at Ngwe Saung Beach (also Ayeyarwaddy Region). Yet Myanmar has 3,400 km2 of land with wind speeds greater than 6 meters per second, the minimum needed for modern wind turbines. Admittedly, this equates to only 0.5% of the country’s total area. Nevertheless, Myanmar’s theoretically installed wind capacity stands at approximately 33 GW.14 Myanmar’s solar industry is also mainly at the experimental stage with no large-scale solar system installed in Myanmar so far. Yet 60% of the country is suitable for solar photovoltaic (PV) development. The country’s peak potential regarding solar energy is estimated to stand at 27 GW.15

Many reject wind and solar, arguing that neither technology would be affordable for Myanmar. Yet electricity generated by large wind farms is already cheap enough in many places around the world to compete effectively with electricity generated by coal and natural gas (with the levelized cost of electricity (LCOE) at USD 83 per megawatt hour for wind16, compared to USD 75 for coal and USD 82 for natural gas in the Americas, for instance). While the LCOE of solar panels still stands at USD 122, of all energy technologies solar has seen the most significant cost declines since 201017 and experts believe that this decline will continue for the foreseeable future. The LCOE of wind, solar, coal and natural gas are projected to be similar by 2030.18 (The levelized cost of electricity (LCOE) is a measure of a power source which attempts to compare different methods of electricity generation on a comparable basis. It is an economic assessment of the average total cost to build and operate a power-generating asset over its lifetime divided by the total energy output of the asset over that lifetime.)

If Myanmar embraces novel renewable technologies such as wind and solar power as well as various energy efficiency measures, the country’s immediate energy demand can be met and its energy mix may fundamentally transform within the next decade. 72% of Myanmar’s current electricity is generated by hydropower plants, 23% comes from natural gas. By 2030, Myanmar may be able to generate 15% of its energy from wind and 27% from solar energy. 37% of Myanmar’s electricity would still be generated from hydropower plants and 8% from natural gas, according to projections by WWF Myanmar (Figure 1).

The Road Ahead

Myanmar could become a global leader for renewable and sustainable energy, a country that is entirely fueled by renewable and sustainable energy sources. The country is lacking energy today and many blackouts occur even its Yangon, its industrial capital. Yet it may even be able to export electricity abroad in the future, functioning as a battery in Southeast Asia due to its vast renewable energy potential. Most energy would be exported if renewable energies were embraced, according to expert assessments. But obviously, local demand must be fully met before exporting any energy abroad.

While many measures must be undertaken in order to develop Myanmar’s energy sector, four steps may be necessary immediately.

First, additional studies are needed to verify and give nuance to energy demand projections and energy potential estimates for Myanmar. For instance, we suspect that even the most conservative estimates by Myanmar’s Ministry of Electric Power (now the Ministry of Electricity and Energy) may inflate future energy demands since rapid advances in energy efficiency are not yet adequately accounted for. Furthermore, available data on wind energy sources, for example, is not yet sufficient to evaluate suitable sites for the construction of wind turbines. Additional studies may also focus on best practice policy measures implemented by countries that have also faced massively accelerated energy demands in recent decades. Thailand may be a particularly relevant case to study. These various studies need to be commissioned by the relevant authorities in Myanmar as soon as possible and need to be completed by the end of 2016 at the latest.

Second, a public discourse is needed on Myanmar’s future energy mix. This discourse must be informed by sound data on Myanmar’s future energy demand and the country’s various energy sources. The construction of large dams in particular is hotly debated in Myanmar these days. The question of utilizing Myanmar’s hydropower resources and additional energy potentials must be a public policy issue, to be debated and decided by political representatives and the people of Myanmar. Public fora and expert consultations could be tools to foster this discourse, resulting in an energy vision that is supported by the majority of people in the country. The relevant authorities are encouraged to draft a civic engagement plan

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20 http://fortune.com/2015/10/06/wind-cheap-coal-gas/
on Myanmar’s future energy policy as soon as possible and start implementing it by Autumn 2016 (there could be an initial focus on expert consultations; public fora could start in early 2017). It is important that the various civic engagement activities must take place all across the country, not only in Myanmar’s major cities.

Third, revisions of the country’s various energy policies are needed. Myanmar currently lacks a set of well-defined strategies, policies and plans for promoting energy efficiency and conservation. For instance, there are no specific incentives at present to encourage energy savings. Rather, various petroleum products are subsidized, for instance, which discourages energy efficiency and conservation. Furthermore, current regulations do not emphasize that Myanmar is welcoming investments in its renewable energy sector, but impose significant red tape, particularly on foreign investors. A comprehensive and transparent energy policy framework promoting renewable energy technologies and energy efficiency measures is urgently needed and needs to be developed jointly by relevant authorities in Myanmar as well as experts from outside, e.g. international donors. Its initial version needs to be adopted by mid-2017.

Fourth, institutions must be created to deliver Myanmar’s future energy vision and effectively manage Myanmar’s energy sector. The vision can only be delivered once a comprehensive institutional overhaul is undertaken. Currently, responsibilities for Myanmar’s energy sector are scattered across various ministries with numerous, significant overlaps delaying decision-making. For instance, approval of a large solar project may take up to two years. Centralization of responsibilities is needed. It may even be advisable to set up a specific delivery unit within the Myanmar’s Ministry of Electricity and Energy that integrates planning, budgeting, management and monitoring of the country’s energy sector. This unit would directly report to the Minister of Electricity and Energy to accelerate decision-making. It would commence its work upon launch of the comprehensive and transparent energy policy framework.

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http://www.energynet.co.uk/webfm_send/1186

Figure 1: Myanmar’s current and future energy mix

<table>
<thead>
<tr>
<th>Generation shares, %</th>
<th>2014</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>Solar</td>
<td></td>
<td>37</td>
</tr>
<tr>
<td>Hydropower</td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>Wind</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>13</td>
<td></td>
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</tbody>
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1. Includes run-of-the-river hydropower (ROR) plants
2. Includes concentrating solar power (CSP) technologies
3. Mainly Biomass

This policy brief is largely based on the WWF report “Alternative Vision for Myanmar’s Power Sector: Towards full Renewable Electricity by 2050”. This report – featuring details regarding sustainable energy scenarios for Myanmar as well as additional policy recommendations—can be accessed via: http://wwf.org.mm/en/alternativevision.

Selected references


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မဂၢဇင္းမႀပင္ နန္႔သားမုန္မာႎိုင္ငံအား ၂၀၁၅ ခုႎႀစ္

၁ႚ၂ ကီလိုဝပ္ တာဘိုင္၊ (ေကဵာက္ဆည္တၾင္ပင္ရႀိသည့္) ဓာတ္ေတာ္ေတာင္ရႀိ ၃ ကီလိုဝပ္ ေလအားစီမံကိန္ဴခင္၊ (အမာ) အစိုးရ (အက္တမ္အဆင့္တၾင္ ေနေရာင္ဴခည္ကုိ လ႖ပ္စစ္အဴဖစ္ ေဴပာင္းလဲသည့္) ဆိုလာဖိုတိုေဗာ္လ္ေတးယစ္အသံုးဴပႂႎိုင္သည့္အတၾက္ ေလႎႀင့္ေနေရာင္က�့သိုႚ ဆန္းသစ္ဴပီး အသစ္ဴပန္လည္အသံုးဴပႂႎိုင္သည့္ စၾမ္းအင္မဵားအေပၞ အေလးထားပၝက ထူးကဲစၾားဴပႂႎိုင္သည့္အတၾက္ ေလႎႀင့္ေနေရာင္စၾမ္းအင္ အလားအလာမဵားကိုလည္း ထည့္သၾင္းစဥ္းစားရပၝဦးမည္။ အဓိကအေဳကာင္းရင္းမႀာ ၄င္းနည္းပညာမဵားကိုရင္းႎႀီးဴမႂပ္ႎႀံသူအမဵားအဴပားမႀာ ဴမန္မာႎိုင္ငံ၏ေရအားလ႖ပ္စစ္ႎႀ့ားႎႀံသူအမဵားအဴပားမႀာ ဴမန္မာႎိုင္ငံ၏ ယေနႚကာလထက္ ၈၅ ရာခိုင္ႎၵားပၝသည္။ ၂၀၃၀ ခုႎႀစ္တၾင္ စၾမ္းအင္အမဵားဆံုး ၂၄ ဂစ္ဂၝဝပ္အထုတ္လုပ္ရန္ လိုအပ္ႎႀီးဴမႂပ္ႎႀံသူအမဵားအဴပားမႀာ ဴမန္မာႎိုင္ငံ၏ ယေနႚအေရးတဳကီးဴပႂလုပ္ရန္၄င္း၏တိုးတက္မႈအရႀိန္ကို ဆက္လက္ထိန္းသိမ္းေရးအတၾက္ လာမည့္ႎႀစ္မဵားတၾင္ စၾမ္းအင္ကၸ၌ မဵားဴပားစၾာရင္းႎႀီးဴမႂပ္ႎႀံရပၝမည္။ ဴမန္မာႎိုင္ငံသည္ တာရႀည္ခံသည့္စၾမ္းအင္တစ္ရပ္၏အေဴခခံမဵားႎႀာသည္။ ၂၀၃၀ ခုႎႀစ္တၾင္ လ႖ပ္စစ္လည္း လူတိုင္းအသံုးဴပႂႎိုင္ လာပၝမည္။ ယခု အင္ဒိုနီးရႀား၏ ဴပည္တၾင္းအသားတင္ ကုန္ထုတ္လုပ္မႈတန္ဖိုးမႀာ ဴမန္မာႎိုင္ငံထက္သံုးဆရႀိဴပီး ထိုင္းႎိုင္ငံမႀာငၝးဆရႀိေနပၝသည္။ ႎိုင္ငံ၏ ဴပည္တၾင္းအသားတင္ ကုန္ထုတ္လုပ္မႈတန္ဖိုးမႀာ ဴမန္မာႎိုင္ငံထက္သံုးဆရႀိဴပီး ထိုင္းႎိုင္ငံမႀာငၝးဆရႀိေနပၝသည္။ ႏိုင္ငံ၏
စက္ရံုမဵားမႀ ထုတ္လုပ္ဴပီး ၂၃ထိေရာက္မႀိသည့္ ေဆာင္ရၾက္ခဵက္အမဵိႂးမဵိႂးကုိလက္ခံပၝက ႎိုင္ငံ၏လက္ငင္းစၾမ္းအင္လုိအပ္ခဵက္ကုိ ဴဖည့္ဆည္းႎႀင့္လာမည့္ ဆယ္စုႎႀစ္အတၾင္း ေကဵာက္မီးေသၾးႎႀင့္ သဘာဝဓာတ္ေငၾတိုႚ၏ ေလစၾမ္းအင္အတၾက္ ပဵမ္းမ႖လ႖ပ္စစ္ကဵစရိတ္ သိုႚေသာ္လည္း ဳကီးမားသည့္ေလစၾမ္းအင္ထုတ္စက္ရံုမဵားမ ႀထုတ္လုပ္သည့္လ႖ပ္စစ္မႀာကမႝာ့ေဒသအမဵားအဴပားတၾင္ ေကဵာက္မီးေသၾးႎႀင့္ အဴမင့္ဆံုးအလားအလာမႀာ ၂၇ ဂစ္ဂၝဝပ္ ရႀိသည္ဟု ခန္ႚမႀန္းထားပၝသည္။

သုိႚရာတၾင္ ႎိုင္ငံ၏ ၆၀ဴမန္မာႎိုင္ငံ၏ ေရအားလ႖ပ္စစ္အရင္းအဴမစ္မဵားႎႀင့္ အဴခားစၾမ္းအင္ အလားအလာမဵားကုိ အသံုးဴပႂဴခင္းမႀာ ဴပည္သူႚမူဝၝဒကိစၤတစ္ရပ္ဴဖစ္ဴပီး သိထားရန္လိုပၝသည္။ ယခုတေလာဴမန္မာႎိုင္ငံတၾင္ ေရကာတာဳကီးမဵားတည္ေဆာက္မႀိႎႀင့္ ပတ္သက္ဴပီး အဴပင္းအထန္ေဆၾးေႎၾးလ႖က္ရႀိပၝသည္။ ဴမန္မာႎိုင္ငံ အနာဂတ္စၾမ္းအင္လိုအပ္ခဵက္မဵား၊ ႎိုင္ငံရႀိစၾမ္းအင္ရင္းဴမစ္အမဵိႂးမဵိႂးႎႀင့္ပတ္သက္၍ ခိုင္လံုသည့္ အခဵက္အလက္မဵားတိုႚကုိ ထိုသုိႚေလ့လာေရးအတၾက္ အထူးသက္ဆိုင္ႎိုင္ပၝသည္။

4င္း၏စက္မ鳟ာႚေတာႀဖစ္ရာရန္ကုန္ဴမိႂႚတၾင္ပင္ မီးဴပတ္ေတာက္မ鳟ာႀမဵားစၾာေပၞေပၝက္ေနပၝသည္။ သိုႚေသာ္ အနာဂတ္ကာလတၾင္ ႎိုင္ငံဴခားသုိႚတင္ပိုႚ ရမည္မႀာ ထင္ရႀားပၝသည္။ ဆိုပၝက စၾမ္းအင္အမဵားစုကုိ ဴပည္ပသိုႚတင္ပိုႚေရာင္းခဵမည္ ဴဖစ္ပၝသည္။

1 http://fortune.com/2015/10/06/wind-cheap-coal-gas/
မြန်မာပြည်နယ်ဖြစ်သည့် ငွေကြေးအစိတ်အပိုင်းမှ အစိုးရမှ အရေးပေါ်မြောက်ချက်တို့ အေကာင်အထည်းဖွု့ပေးမည်ဖြစ်သည်။ လက်ရှိအချိန်တွင် ဗီယက်နမ်စိုးရိမ်အစိုးရကို အဖွဲ့အစည်းများတည်ထောင်ရမည်ဖြစ်သည်။ စိုးရိမ်အဖွဲ့အစည်းတစ်ခုလုံး ပြည်သူ့ အစိုးရမှ အောင်ပြားလျော်ပေးလျှင် မြန်မာပြည်စိုးရိမ်အဖွဲ့အစည်း၏ ဗီယက်နမ်စိုးရိမ်တို့ကို အတည်ပြေးပြီး လုံးချင်းများကို အားပေးရမည်။

စိုးရိမ်မူဝါဒလုပ်ငန်းစားတစ်ခုလုံး အေရးတာလုံးရှိန်ပေးသည်။ မြန်မာပြည်မှာ ဗီယက်နမ်စိုးရိမ်အဖွဲ့အစည်းအတွက် အရေးပေါ်မြောက်ချက်များကို စိုးရိမ်အဖွဲ့အစည်း၏ ဗီယက်နမ်စိုးရိမ်များကို အတည်ပြေးပြီး လုံ၀ားချင်းများကို အားပေးရမည်။ ချုပ်စားအောင် ချုပ်စားချင်းများကို လွယ်မှုသို့ များစွာပြောင်းလဲျဖစ်ရမည်။

မြန်မာပြည်အနာဂတ်စိုးရိမ်မူဝါဒအတွက် ပြည်သူပူးပေါင်းရေးအစီအစဥ်တစ်ခုကို တတိယနေ့ဖြင့် ဗီယက်နမ်စိုးရိမ်အဖွဲ့အစည်းမှ အရေးပေါ်မြောက်ချက်များကို ထိုသို့ သောက်ရန်လိုအပ်ပေးသည်။ မြန်မာပြည်တွင်စိုးရိမ်ထိုင်ရာ စိုးရိမ်အဖွဲ့အစည်းကို လေ့လာရေးတွင်းမှာ ပြည်သူပူးပေါင်းရေးအစီအစဥ်များကို ထိုသို့ သောက်ရန်လိုအပ်ပေးသည်။

မြန်မာပြည်တွင် စိုးရိမ်အဖွဲ့အစည်းအတွက် အရေးပေါ်မြောက်ချက်များကို လေ့လာရေးတွင်းမှာ ပြည်သူပူးပေါင်းရေးအစီအစဥ်များကို ထိုသို့ သောက်ရန်လိုအပ်ပေးသည်။

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1. Includes run-of-the-river hydroelectricity (ROR) plants. 2. Includes concentrating solar power (CSP) technologies. 3. Mainly biomass.
Ansar et al. (2014). Should we build more Large Dams? The Actual Costs of Hydropower Megaproject Development


WWF (2016). Alternatives for Power Generation in the Greater Mekong Sub-Region