

In Our Image



Norway's Role in the Global Hydropower Industry

FIVAS – The Association for International Water Studies – is a Norwegian voluntary organisation working to monitor the consequences of water projects and developments in the South. FIVAS was founded in 1988 as an expansion of activism towards Norwegian involvement in the Sarawak Hydropower development. The organisation seeks to prevent any Norwegian participation in projects with major negative consequences for people and nature and works to promote fair and sustainable alternatives.

Since 1985, **International Rivers** has been at the heart of the global struggle to protect rivers and the rights of communities that depend on them. International Rivers works with an international network of dam-affected people, grassroots organizations, environmentalists, human rights advocates and others who are committed to stopping destructive river projects and promoting better options.

Based in five continents, their staff has expertise in dams, energy and water policy, climate change, and international financial institutions. They support partner organizations and dam-affected people by providing advice, training and technical assistance, and advocating on their behalf with governments, banks, companies and international agencies. The focus of their work is in Latin America, Asia and Africa.

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Cover photo: Construction at the Theun Hinboun hydropower station. FIVAS, Andrew Preston

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Note on Currency:

Exchange Rate: 1 USD = 5.939 Norwegian Kroner (NOK) as of August 13, 2012.

Abbreviations

ADB	Asian Development Bank
AfDB	African Development Bank
CDM	Clean Development Mechanism
CIFI	Corporación Interamericana para el Financiamiento de Infraestructura
EEPCO	Ethiopian Electric Power Corporation
G-20	Group of 20
GGGI	Global Green Growth Institute
GIEK	Norwegian Guarantee Institute for Export Credits
HSAF	Hydropower Sustainability Assessment Forum
HSAP	Hydropower Sustainability Assessment Protocol
ICH	International Centre for Hydropower
IEA	International Energy Agency
IFC	International Finance Cooperation
IHA	International Hydropower Association
ILO	International Labor Organization
kWh	Kilowatt-hours
MFA	Norwegian Ministry of Foreign Affairs
MW	Megawatt
NBI	Nile Basin Initiative
NBIM	Norges Bank Investment Management
NGO	Non-governmental Organization
NORAD	Norwegian Agency for Development Cooperation
NVE	Norwegian Water Resources and Energy Directorate
OECD	Organization for Economic Cooperation and Development
REDD+	Reducing Emissions from Deforestation and Forest Degradation Plus Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UN-SEFA	The United Nations Sustainable Energy for All Initiative
tWh	Terawatt-hours
WBG	World Bank Group
WCD	World Commission on Dams
WWF	World Wide Fund for Nature

Introduction

After a downturn during the 1990s, global investments in hydropower infrastructure have begun to rise. Governments and financiers have strongly pushed for hydropower to play a central role in “green growth” strategies, claiming that large dams are the best option to achieve sustainable development’s triple bottom line of economic growth, social inclusion, and environmental protection. Multi-stakeholder fora such as the G-20 Summit and the UN Rio+20 Conference on Sustainable Development called in 2012 for a transition away from a fossil fuel-based economy, placing the large-scale hydropower market back in fashion.

Yet, the roles of hydropower financiers have changed. Today most new hydropower projects are financed by national governments that have enough capital to build their own dams as well as play a role in regional and overseas markets. The world’s largest dam builder, Chinese state company Sinohydro, is responsible for 65% of all domestic hydropower projects in China, and is also the world’s largest overseas dam builder, responsible for 132 hydropower projects across the world.¹ Brazilian and Indian companies are also emerging as leading dam builders and financiers, playing a strong role in the construction of dams in regional markets.

As a result, the hydropower sector’s traditional lenders – multilateral financial institutions such as the World Bank, the International Finance Corporation (IFC), and the Asian Development Bank (ADB) – have increasingly turned to another area of development finance: technical expertise, know-how, and other forms of knowledge-based support. These types of support are often disbursed as

programme and policy loans that aim to build borrowers’ regulatory capacities. In 2009, for example, development policy operations made up over half of the World Bank’s public sector loans.² Multilateral lenders have indicated that they plan to return to financing large dams either directly or by forming public-private partnerships with other lenders.³ However, these institutions may now be more sought after for their role as knowledge brokers, amassing, circulating, and leveraging large amounts of technical information and know-how, than they are for their role as project financier.

The significance of knowledge brokers to development finance is not new. Indeed, technical, policy, and know-how lending has characterized bilateral lending for quite some time. Yet, the significance of knowledge-based loans to development finance often goes underestimated. In the hydropower sector, one country especially stands out for its unique history of financial, technical, and policy support: Norway.

Dating from the country’s period of late industrialization at the turn of the 20th century, hydroelectric power has been one of Norway’s key assets. Today, approximately 95% of Norway’s mainland electricity is produced from hydropower, and the relatively inexpensive electricity has powered the growth of a large energy-intensive industry that consumes approximately 54 tWh of electricity per year⁴. Norway’s population of 4,952,000 enjoys relatively universal access to electricity, and consumes approximately two thirds of the electricity the industry does. The country’s services sector consumes approximately 20 tWh a year.

Norway's experience in developing its own hydropower sector has taught the country many lessons that have been applied abroad through financial, technical, and policy support with the public and private sector. Strong concession laws and large state and public ownership in Norway have resulted in strong cooperation between the state and industrial operators. After the Second World War, the state took a more active role in supplying electricity for energy-intensive industries, and from 1945 to 2000 the proportion of installed capacity owned by the state grew from 12 % to 56 %⁵. Norway's multitude of small rivers has allowed many small municipalities to produce electrical power, and high rates of access to electricity have historically been achieved. Meanwhile, the government has leveraged private concessions in order to guarantee delivery of electricity at the state and municipal levels.

Yet, these lessons have not prevented Norwegian investors from becoming embroiled in controversial projects. The Norwegian public and private sectors have supported corrupt governments and highly damaging projects, from Ethiopia to Brazil. Norwegian contractors with support from the Norwegian government have been involved in controversial dams such as in Sarawak, Malaysia, the Bio-Bio Dam in Chile, and the Bujagali Dam in Uganda. Norwegian state institutions have been active participants in projects that impact areas of high biodiversity, such as the planned Xayaburi Dam and the Nam Theun hydropower station in the Mekong basin.

This report surveys Norway's diverse forms of support for the global hydropower sector, and examines some of the surrounding controversies. In section one, we discuss why large dams are far from the golden bullet for sustainable development that their proponents make them out to be, and remind the reader that free-flowing rivers play significant functions in sustaining ecosystems and a healthy climate.

In section two, we briefly examine the general significance of industrial versus residential electricity demand as a rationale for hydropower sector support. In section three, we discuss the diverse forms of Norwegian support for the global hydropower industry. These include: bilateral development cooperation (I); the participation of Norwegian state-owned companies in the hydropower market (II); equity and securities investments of the Norwegian Government Pension Fund (III); Norway's foundational role in the Energy+ Initiative, created in 2011 (IV); and support for multilateral policy dialogues (V). In section four, we briefly outline Norway's current and potential support for emerging renewable energy markets, and in section five, we present our conclusions and recommendations for Norway to improve the social and environmental performance of the hydropower sector, and to promote a greater transition to cleaner, less controversial forms of support.



I The Importance of Watersheds and the Impact of Dams on Freshwater Systems

Climate change presents multiple challenges to countries' diverse economies. While it is imperative to change the make-up of global infrastructure in order to reduce greenhouse gas emissions, trading fossil fuels for large hydropower may continue to do harm. Healthy watersheds and freshwater rivers play significant system functions to sustaining life on Earth and the global climate, and dams' broad social and environmental impacts may outweigh perceived benefits.

The Importance of Watersheds

Land and water are ecologically linked in a natural system called a catchment, drainage basin, or watershed. From the smallest droplet to the mightiest river, water works to shape the land, taking with it sediment and dissolved materials that drain to watercourses and, in most cases, eventually to the sea. So, too, is the river a product of the land it inhabits – the type of rock and soil, the shape of the land, the amount of rainfall and type of vegetation are some of the factors that determine the river's shape, size and flow.

We all belong to a watershed. A watershed is literally an area of land that catches all the rain and directs it to a stream, river or lake. A watershed also includes all the humans, plants and animals that live in it, and all the things we have added to it such as buildings and roads. Everything we do affects our watershed – from washing clothes and growing food to mining, commercial farming, and building roads or dams. The reverse is also true: our watershed affects everything we do, by determining what kinds of plants we can grow, the number and kinds of animals that live there, and how many people and livestock can be sustainably supported by the land.

One important truth about watersheds is that we all live downstream from someone, and upstream from

someone else. Anything dumped on the ground in the watershed can end up in its rivers, lakes or wetlands. And anything released to the air can come down again, nearby or thousands of miles away. A watershed's water may be made undrinkable by activities many kilometers away. To understand the water quality of a stream, one must look at the entire area it drains.

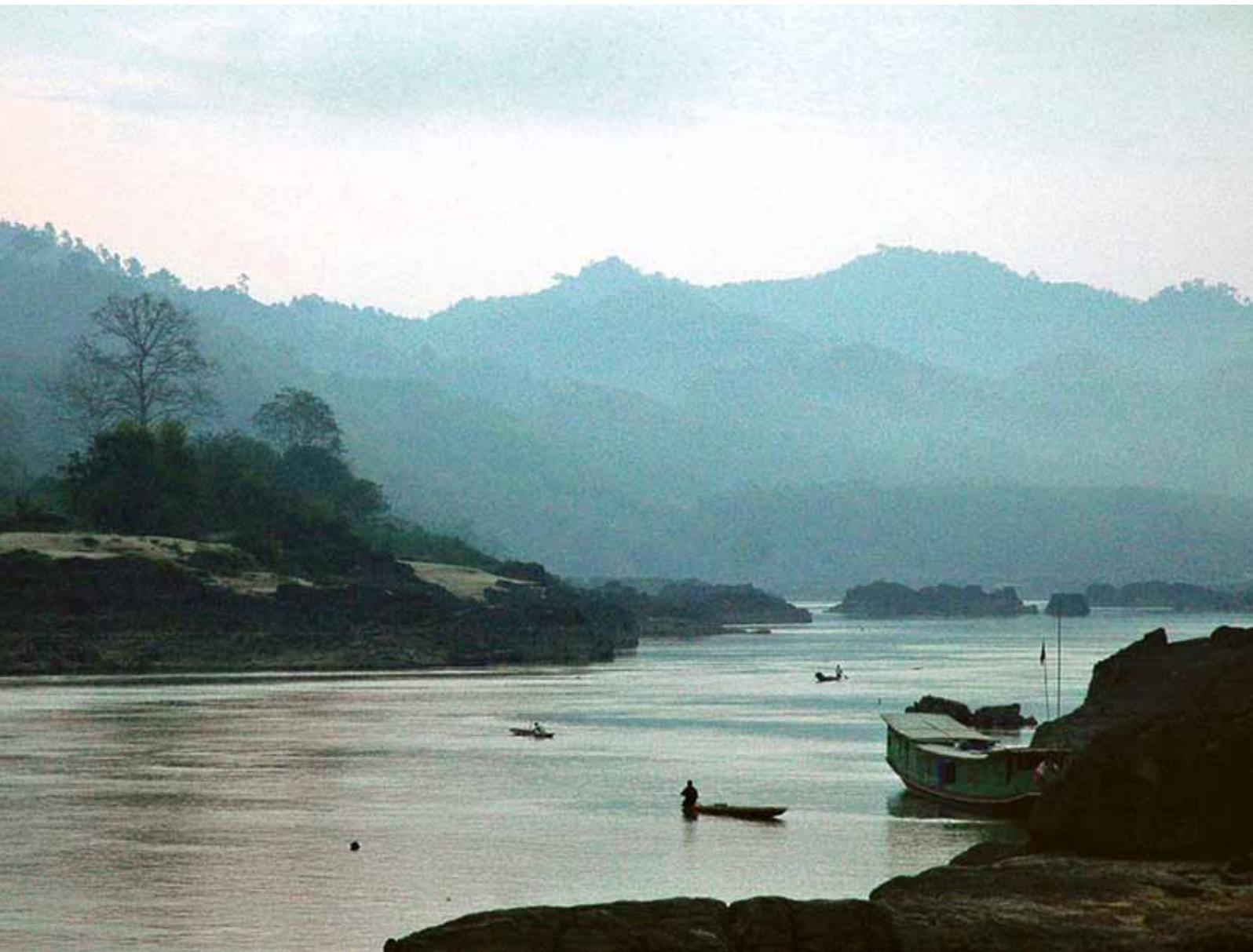
We are all connected through watersheds. Watersheds do not respect political boundaries, and in fact can encompass several cultural, national and economic boundaries. What happens in one country's part of the watershed will impact water quality, quantity, or people who depend on it in the countries downstream.

Rivers and Biodiversity

River systems are the zone of Earth's highest biological diversity – and also of our most intense human activity. Freshwater biodiversity is in a state of crisis, a consequence of decades of humans exploiting rivers with large dams, water diversions and pollution.⁶ Freshwater species are even more endangered than those on land.

Large dams harm biological diversity by flooding land, fragmenting habitat, isolating species, interrupting the exchange of nutrients between ecosystems, and cutting off migration routes. They reduce water and sediment flows to downstream habitat, and change the nature of a river's estuary, where many of the world's fish species spawn. The impacts from dams increase the vulnerability of entire ecosystems to other threats, such as climate change.

The irretrievable loss of the Yangtze River baiji dolphin to the Three Gorges Dam or the extinction of a third of all wild salmon runs on dammed rivers throughout the US West are just the most charismatic examples of how



The Mekong River near the Xayaburi Dam site. Photo: International Rivers, Kirk Herbertson

humans are shredding the safety net that supports our own existence and viability.

Biological richness and diversity nourish us, keep our water clean, produce breathable air and fertile soil, and ultimately give our planet the capacity to re-generate. By harming river basins, we undermine the ability of life to create the conditions conducive to life.

Rivers and Climate Change

Rivers are central to the deposition of soil that drives natural systems of carbon sequestration. Floodplain inundation cycles lead to the accumulation of organic

material in rich peat soils, which store carbon absorbed through associated biomass. When dams significantly modify or altogether interrupt rivers' natural inundation cycles, rivers are no longer able to deposit organic material, reducing the ability of soils and biomass to capture carbon.

Dams may also emit greenhouse gases. As biological materials decompose in water they release carbon dioxide and methane. Cold and oxygen poor water, frequent in reservoirs increase the production of methane gas when biological materials decompose. In the tropics, dam reservoirs and spillways are a globally significant source of one of the most potent gases, methane. Even

outside of the tropics, some dams can be significant sources of methane.

What's more, due to climate change, river flows have become increasingly unpredictable. Large dams have always been based on the assumption that future stream-flow patterns will mirror those of the past, but this is no longer true. Climate change has begun to significantly and unpredictably change precipitation patterns. On the one hand, more frequent droughts will make many hydropower projects uneconomic, while on the other, more extreme rainfall will increase siltation of dams (reducing their useful lifetimes) and increase the risk of dam failures and catastrophic flood releases.

sources and other natural resources in the dammed area. Millions have suffered from diseases exacerbated by dams and large irrigation projects in the tropics. Those living downstream of dams have suffered from the hydrological changes dams bring to rivers and ecosystems.

The Social Impacts of Large Dams

By the end of the 20th century, the dam industry had built some 50,000 dams on more than half of the earth's major rivers. The social consequences have been devastating. The world's large dams have flooded huge amounts of productive wetlands, forests, farmlands, and fisheries, making it harder for people downstream to adapt to climate change.

Large dams have displaced some 40-80 million people from their lands in the past six decades, according to the World Commission on Dams. Indigenous, tribal, and peasant communities have particularly felt the impacts. The lives of these displaced populations, in the majority of cases, have worsened economically, culturally and psychologically.

Those displaced by reservoirs are only the most visible victims of large dams. Millions more have lost land and homes to the canals, irrigation schemes, roads, power lines and industrial developments that accompany dams. Many more have lost access to clean water, food

II Hydropower and Energy Access

Meanwhile, few large hydropower dams are built to meet residential demand exclusively. Instead, demand from industrial users, who consume far more electricity and are usually willing to pay higher electricity tariffs, usually provides the financial rationale.

Norway's electric grid developed in such a fashion. The guaranteed demand of energy-intensive users provided the economic rationale for dam building, and residential electricity demand was attended to secondarily. In general, these industrial users tend to be energy-intensive industries, such as mineral smelters. Of all mineral commodities, finished aluminum has the highest electricity load: 15,000-18,000 kWh per metric ton (see box).

Norway's Electric Grid

As of 2010, Norway's electric grid was constituted of 94.7% hydropower.⁷ The country consumes an average of 124 twh yearly⁸. Energy intensive industry consumes slightly over 50 TWh while residential use consume approximately 35 TWh and services around 25 TWh⁹. Among its residential users, Norway's population of 4,952,000 enjoys a high rate of energy access at 99%. Norway's average household electricity demand is the largest in the world, at 23,550 kWh per year. 60% of this electricity load goes to heating.

In particular, the aluminum sector consumes Norway's highest quantities of electricity. In Norway, there are seven smelters responsible for the large share of the country's aluminum production: Årdal, Høyanger, Husnes, Karmøy, Lista, Mosjøen, and Sunndal. They are owned by Hydro Aluminum (43% owned by the Norwegian state), Sor-Norge Aluminum (Sørål), Alcoa Lista, and Alcoa Mosjøen. Together, Norway's aluminum smelters produce 800,000 metric tons of aluminum per

year.¹⁰ Other industrial sectors also consume electricity. As a result, industrial users' electricity load far outweighs that of Norway's residential sector.

In general, the world's electricity consumption follows a similar pattern, and this economic fact lies at the heart of Norway's financial and political support for large hydropower abroad. Through its support for hydropower, Norway takes a position that countries can and should develop through growth in extractive commodities sectors.

By way of illustration, in Table 1, we present the relative energy intensities of the mineral commodities that most commonly consume hydropower. To produce one ton of any given mineral commodity usually requires a separate load of electricity at each stage along the transformation process. For example, the extraction of bauxite, the raw material of aluminum, requires 13 kWh/ton. To transform bauxite into alumina, a sub-material of aluminum, requires 300 kWh/ton. Finally, to transform alumina into its final product, aluminum, requires around 14,800 kWh/ton. Aluminum is a particularly energy-intensive product; electricity represents 76% of the energy required to produce one ton.

Similarly, the production of one ton of steel also requires high amounts of electricity. Steel is produced in four stages: iron extraction (17 kWh/ton), iron sintering (30 kWh/ton), iron pelletization (41 kWh/ton), and steel production (1700 kWh/ton). To produce iron alloys – a combination of iron with other metals – requires 7000 kWh/ton. The production of one ton of steel has an energy intensity of 81%.

Commodity	Electricity load per ton	Electricity as % of total energy required
Aluminum	14,800 kWh	76%
Ferro-Nickel	13,000 kWh	N/A
Ferro-Silicon	13,000 kWh	N/A
Silicon	12,000 kWh	67%
FerroAlloys	7200 kWh	48%
Tin	5200 kWh	86%
Zinc	3800 kWh	N/A
Steel	1700 kWh	81%
Copper ore extraction	1700 kWh	45%
Alumina	300 kWh	18%
Iron pellet	41 kWh	13%
Iron sinter	30 kWh	6%
Iron ore extraction	17 kWh	N/A
Bauxite ore extraction	13 kWh	N/A

Table 1. Comparative Mineral Electricity Consumption per Ton¹¹

Country	Average household electricity load per year
Norway	23,550 kWh
Canada	15,471 kWh
United States	12,914 kWh
Japan	7,819 kWh
France	7,468 kWh
Germany	6,779 kWh
United Kingdom	5,692 kWh
South Africa	4,532 kWh
China	2,631 kWh
Brazil	2,206 kWh
Cameroon	271 kWh
Democratic Republic of Congo	104 kWh
Ethiopia	46 kWh

Table 2. Average Household Electricity Consumption per Country¹²

The electricity demand of these energy-intensive mineral sectors far outweighs most countries' residential demand. In Table 2, we present a list comparing some of the world's yearly residential electricity loads. Of all countries, Norway has the highest average yearly household rate of electricity consumption at 23,550 kWh per year, or roughly the amount of electricity needed to produce one and a half tons of aluminum, 4.5 tons of tin, or 14 tons of steel. In contrast, the average household in the Democratic Republic of Congo consumes only 104 kWh per year, or enough electricity to produce 0.007 tons of aluminum, 0.02 tons of tin, or 0.06 tons of steel. Certainly, cases such as these highlight the importance the mineral commodities sector plays to a country's growing energy demand, and the potential for meeting residential demand by using alternative options.



Hydroelectric turbine. Photo: Florean Fortescue

Calculating Energy Demand: Industrial Versus Residential Users

To calculate the quantity of hydroelectricity consumed by industries versus homes for a specific dam, it is necessary to calculate the *capacity factor* of the dam, and the *load factor* of industrial versus residential consumers. A dam's capacity factor is the ratio between its *average performance* (average generating capacity) and its rated capacity (installed capacity, or potential generating capacity). Consumers' load factor, meanwhile, is the ratio between average electricity consumption, or *average load*, and the peak consumption, or *peak load*, of a given sector.

In general, the industrial sector always has a much higher average load than the residential sector. This is because industries have electro-intensive machines that require fixed amounts of energy, generally include various refinery processes that each add incremental electricity costs, are generally always operating at peak capacity, and can remain powered on 24 hours a day, 7 days a week, 365 days out of the year.

In comparison, the amount of residential consumption of electricity is much lower. Residential electricity load is

shaped by a number of factors. Socioeconomic factors such as the number of homes with access to electricity, and the economic ability to purchase electro-domestic items such as televisions, washing machines, air conditioners, and music players, shape who consumes electricity. Geographical factors such as urban-rural distributions of population, and climatic conditions that necessitate the use of air conditioners or heaters, shape where electricity consumption is highest. Temporal factors, such as time of use, shape when electricity is being consumed. Residential electricity consumption is usually lower at night, while industrial consumption often continues unabated during 24 hours. Finally, qualitative factors, such as what types of machines consume electricity, shape electricity consumption. Electro-intensive machines used by industry generally need many times more energy than the electro-domestic machines used by the residential sector. Due to a number of factors, residential electricity load is always generally lower than industrial electricity load.

III Norway's Global Role in Hydropower Development

Norway's support for global hydropower development comes in diverse forms, ranging from the more obvious, such as direct project finance, to the less obvious, such as hosting multilateral policy dialogues. Among the most significant we will present here are: bilateral sectoral support; corporate involvement; government pension fund investments; the Energy+ Initiative; and multilateral policy dialogues. Controversy, however, has not escaped Norwegian players, as we will see below.

Who's who?

Norway's international support for hydropower is mainly channeled through a handful of players. Mostly these agents are state institutions, but have different strategies and different relationships to the public sector. Most companies and institutions will be presented within the following subchapters. However, we give a short summary introduction here.

The Ministry of Foreign Affairs (MFA) is significant on the international scene when it comes to hydropower. The Ministry and Embassies in recipient countries handle a significant part of Norwegian aid. Norad is also organized under the MFA.

The Norwegian Agency for Development Co-operation (Norad) is Norway's directorate for development cooperation under the Ministry of Foreign Affairs. Norad handles significant parts of the bilateral aid and has different technical departments such as climate and energy, and economic development and governance.

The Ministry of Petroleum and Energy is the ministry responsible for Norwegian hydropower and the owner of Statkraft and Statnett.

NVE, The Norwegian Water Resources and Energy Directorate, is a government directorate under the Norwegian Ministry of Petroleum and Energy. NVE is

the regulating authority for Norwegian hydropower. NVE is involved in several projects in developing countries.

Statkraft is a state-owned company and the largest producer of hydropower in Norway. Statkraft is also active in other energy sectors and has installations outside Norway in Europe and elsewhere.

Statnett is a state-owned company responsible for transmission lines in Norway. Statnett is building transmission lines as acting agency for Norad.

Norfund, The Norwegian Investment Fund for Developing Countries, is a state-owned company with a mandate to invest in developing countries. They have a focus on renewable energy and agriculture. Norfund is organized under the MFA.

The Norwegian institute for Export credits, GIEK, is a Norwegian state-owned credit agency organized under the Ministry of Trade and Industry.

SN Power is a hydropower company owned by Norfund and Statkraft with a mandate to develop hydropower in developing countries. Agua Imara is a subsidiary of SN Power with equity from other regional Norwegian hydropower companies.

TrønderEnergi is a regional Norwegian hydropower company owned by a group of municipalities ("kommune"). TrønderEnergi is one of the owners of Agua Imara and has recently expanded activities to Uganda.

Veidekke is one of Norway's major entrepreneurial companies. Veidekke has been involved as a contractor in hydropower projects internationally.¹³

As Norway is a country with a large array of different waterways and watersheds, and has a long history of hydro-



Statkraft's Cakit Hydropower Plant, Turkey. Photo: Statkraft

power, it is unsurprising that the country's know-how in hydrology and hydropower is strong. In this web of actors there is significant technical expertise, both for predicting energy production and assessing impacts on nature such as erosion and landslides. There is also a strong academic milieu around Norway's technical university and other institutions of higher education. The International Centre for Hydropower, a research and training organization, is

also located in Trondheim, Norway. As petroleum was in the last decade, hydropower is now a burgeoning industry. Migration between the companies and the state, and in between institutions, is also commonplace, while informal connections and shared knowledge are a central part of the system. However, Norway's technical expertise is geographically and culturally situated, making the transfer of knowledge to new contexts problematic.

Bilateral Sectoral Support

Energy is one of the main interests of Norwegian bilateral development cooperation. The financial amounts in this field are not the most impressive, amounting to only approximately US\$ 116 million in annual bilateral and multi-lateral transfers (see box). However, the role of the Foreign Ministry and its mission as a facilitator and door opener for other business interests should not be underestimated. Norway's commitment to energy development cooperation is based upon a self-perception of a country with unique experiences in developing and regulating hydroelectric production, and a strong domestic hydropower industry.

Norwegian embassies and Norwegian regulatory institutions are important in channelling bilateral aid for energy. The specialized regulatory directorates and sectoral ministries are often a party to implementation of programmes. The embassies and Norad have a supervisory role. Their perception of the societal effects of development in the energy sector and implications for human rights are therefore decisive. As technical aid has increased over the last decade, the staff at Norad and embassies have decreased.

Norway's Regulatory Regime

Norway has a thoroughly-built regulatory regime for hydropower. With some 95 % of Norway's electricity coming from hydropower, Norwegian institutional know-how is significant. Nonetheless, development of Norwegian hydropower has not been without controversy, and this complexity is seldom reflected in the narrative informing the Norwegian international effort. Norwegian assistance to the hydropower and energy sectors is mostly on a technical level, which sidelines political controversies and dubious societal effects as externalities.

Norway's development assistance follows strong technical regulations like the IFC Performance Standards, and mostly avoids larger controversial hydropower projects. There



Kangate, Ethiopia. The Nyangatom tribe letting their herd down to water at the Omo river.

Photo: Carsten Brink

is a broad scope of support for the power sector, such as sectoral support for state regulatory bodies, market liberalization through restructuring of state organisations and construction of regional power pools, constructing transmission lines, and conducting feasibility studies. These are all activities that are an integral part of expansion in energy production. As a result, these activities cannot be seen as disengaged from other developments in a country's hydropower sector. Yet, Norway's shared responsibility for the cumulative social and environmental impacts of the energy sector does not seem to be on the agenda of the Ministry of Foreign Affairs.

Programs, Policies, and Knowledge Sharing

From a lender's perspective, programmatic and policy loans are beneficial, as hydropower project financiers often ignore or misread the varying degrees of regulatory capacity in developing countries, especially in greenfield projects. International standards are intended to abate this, but without external oversight mechanisms their efficiency can only be partial.



NVE around the world. Illustration by NVE

What's more, entrenched political and social conflicts can seem unintelligible to a lender operating from within a consolidated democracy. Meanwhile, dams and their associated infrastructure are potentially huge interventions in the political, economic, cultural, social, and environmental activity of a country, and when national governments lack legitimacy, or when planning is skewed to gain regional or other favors, dam-building can unexpectedly become a centerpiece for corruption, graft, and Machiavellian politics, rather than a golden bullet to achieve the triple bottom line of sustainable development.

The Norwegian Water Resources and Energy Directorate, NVE, is responsible for management of Norway's water resources, energy markets and systems, and energy efficiency. It is the country's premier institution of hydrological expertise, and has begun to play a greater role in national flood contingency planning, maintaining national power supplies, and preventing damage caused by landslides.

Abroad, the NVE is an active player in development assistance, and often participates in overseas projects through the Norwegian Ministry of Foreign Affairs and Norad.

NVE's development assistance almost always focuses on energy and water, which "are fundamental factors in the struggle to combat poverty, improve health conditions, and increase prosperity in the developing world."¹⁴

NVE carries out development projects in several countries (See map), some Examples are:¹⁵

Bhutan: NVE is developing pre-feasibility and feasibility studies for hydropower projects on Bhutan's glacier-fed rivers, as part of a cooperation programme funded by Norad. NVE's studies have facilitated discussions between SN Power and the Bhutanese government for development of potential dam sites.¹⁶

Ethiopia: NVE supported Ethiopia's Ministry of Water and Energy and the Ethiopian Electric Power Corporation (EPPCO) in developing feasibility studies for the Mandaya & Beko-Abo Multipurpose Dams.

Liberia: NVE has cooperated with the Ministry of Lands, Mines and Energy towards strengthening Liberia's water resources and power sectors

Norwegian Involvement in Uganda and Ethiopia

Norway has had a significant impact in the energy sectors of Uganda and Ethiopia, two countries that serve as examples of sectoral energy development assistance to controversial borrowers for controversial projects. Following is a brief presentation of Norway's involvement in Uganda, while Norwegian involvement in Ethiopia is described below.

In Uganda, Norway has been instrumental in the reorganisation of the electricity sector. Norway has provided technical support for government agencies and contributed in the rewriting of Ugandan law to facilitate the restructuring of the sector. Uganda's formerly monolithic energy utility is now split up into three bodies responsible for production, transmission and distribution. Norway is also considering support for expansion of transmission lines in Uganda – building a triangle covering the north and the Albert Lake area and a connection to Kenya are both on the table. Simultaneously, Norwegian power companies such as TrønderEnergi and Jakobsen Elektro are operating in Uganda, and Norwegian contractors such as Veidekke have been bidding for large projects such as the Bujagali dam. The Norwegian Institute for Export Credits,

GIEK, has considered granting credit insurance to the mega-dam¹⁸. A far smaller project, the Bugoye power station built by TrønderEnergi is supported with equity from Norfund and direct fiscal support as aid through the Ministry of Foreign Affairs. TrønderEnergi sees Bugoye as a start for a broader expansion in Uganda and wants to expand to as many as ten new hydropower sites.

Modernization of the electricity agencies in Uganda has made possible a concession of energy distribution to the privately-owned Umeme Ltd. A common energy market between Kenya, Ethiopia and possibly South Sudan is on the drawing board, called the Eastern African Power Pool.¹⁹ Meanwhile, Uganda has constructed the highly controversial Bujagali Dam on the White Nile, which received the support of the AfDB and the World Bank. The Government of Uganda is also planning to build the Karuma Dam on a previously untouched part of the Nile, situated inside one of Uganda's major national parks. Whilst Norwegian contractors previously have been interested in the Karuma project, it now seems too controversial for any OECD country to support. The Karuma Falls are situated in the middle of Murchison Falls National Park, the largest national park in Uganda. As a result, any construction would greatly interfere with protected wildlife. However, it is not improbable that Uganda would find other supporters for the project.

Norwegian Development Assistance for Clean Energy: Funds declared by Norad

- Of a total of 700 million NOK (US\$ 116.7 million), 1/7th goes to multilateral institutions, and the remaining US\$ 100 million is passed through bilaterally (excluding Norfund).
 - Only 5%, or US\$ 5.8 million, goes to hydropower. The biggest thematic areas are electrical transmission, power generation (non-hydropower) and energy policy.
- In comparison, state-owned Norfund increased its equity in Norwegian dam builder SN Power by US\$ 171 million in fiscal year 2011, an investment matched by Statkraft, bringing total equity to US\$ 1.6 billion.
 - Within Norwegian development cooperation for clean energy, there are seven core countries and 28 non-core countries. Tanzania, Mozambique, Liberia, Uganda, Nepal, Ethiopia and Timor L'este are the seven core countries, ranging in support from over 100 million NOK to under 10 million NOK.¹⁷

The Controversial State of Hydropower in Ethiopia

Ethiopia has a hydropower sector marked by persistent intimidation, repression and human rights violations. The country already has several existing hydropower dams, and a garrison of new projects are planned. Faced with criticism of environmental destruction and social consequences, the Ethiopian government regularly reverts to post-colonial arguments about white Europeans standing in the way of African development. Yet, a 2010 report from Human Rights Watch, “What Will Happen If Hunger Comes?”²⁰ documented how Ethiopian government security forces have used violence and intimidation to force communities to relocate away from their traditional lands in the Lower Omo Valley, in disregard of donor policies.

The Gibe III and Grand Renaissance Dams

The Gibe III Dam, currently under construction, is a clear case in point. The Lower Omo Valley in southern Ethiopia

has been designated a UNESCO World Heritage Site, and 200,000 indigenous people rely on the water distributed by the Omo River to grow crops and to maintain grazing areas for their cattle. The downstream impacts of the dam will impact the ecological health and biodiversity of Lake Turkana in Kenya, which another 300,000 people depend on as their primary water source. Ethiopian developer EEPCO has developed no cumulative impact assessment on the dam and its associated sugar plantation infrastructure.

Human Rights Watch conducted a research trip to the Lower Omo Valley in 2011 and interviewed members of affected communities about their displacement as a consequence of the Gibe III Dam, and the associated development of an industrial sugar cane plantation and processing plant that will be irrigated and powered by the dam. In the interviews, the communities testified that they were forcibly relocated without any consultation or compensation, and that the area to which they were being relocated was not adequate to maintain their current livelihoods.



Construction of the Gibe 3 dam. Photo: FIVAS, Jarand Ullestad

Human Rights Watch found that the communities had no access to information, were never consulted, and had held no discussions with the developer. They had been beaten for asking questions or expressing dissent, and they had received no compensation for the land taken. This pattern of forced resettlement has been noted in other parts of Ethiopia.

With a potential capacity of 1870 MW, the Gibe III Dam would be four times larger than any existing hydro-power plant in Ethiopia. EEPCO's main contractor, Italian company Salini, started construction of the dam in 2006, though it was awarded the contract for Gibe III without tender. Salini has constructed several other dams in Ethiopia, and will probably also be the builder of the gigantic Grand Renaissance Dam, currently planned. Construction of Gibe III has seen flagrant violation of domestic laws, and will affect the livelihoods of eight tribes whose rights to land are recognized by ILO Convention 169. Still, meaningful consultations between EEPCO and the affected tribes did not take place. Environmental and social impact studies were only conducted after construction had started. The project, according to the Ethiopian government, is mainly financed by Ethiopian institutions. Yet, the European Union financed pre-construction studies of the dam, and the World Bank and the African Development Bank are funding a transmission line that extends from Gibe III to the Ethiopian electrical grid. Both the World Bank and African Development Bank previously declined to directly finance the Gibe III Dam, due to its projected high impacts.

The Grand Ethiopian Renaissance Dam, also known as the Millennium Dam, is a project that exemplifies Ethiopia's politically-driven mania for gigantic hydropower dams in violation of human rights and social and environmental standards. The Grand Renaissance Dam, with

a planned capacity of 5250 MW, is projected for the Blue Nile River close to the border of what today is South Sudan. Despite its inevitable consequences for downstream countries due to its location on the Blue Nile, the dam was not presented in the regional Nile Basin Initiative (NBI), a partnership among the riparian countries on the Nile intended to increase cooperation over development of the river. The initiative is supported by 17 donors, among them Norway and the other Scandinavian countries.

When plans for the Grand Renaissance Dam were announced in March 2011, it came as a surprise to donors, since the dam would flood the site of the planned Mandaya Dam, the feasibility studies of which had already been supported by Norway's NVE. The NBI donors were baffled over the unilateral move by Ethiopia, but did not make any statements on this in their annual meeting in Spring 2011. Staff at the Norwegian Ministry of Foreign Affairs (MFA) commented that Ethiopia's heavy-handed attitude was no surprise; Ethiopia has never notified the NBI of any of its intentions.

Norwegian Institutional Cooperation with Ethiopia

Norway supports Ethiopian institutions in many ways. As well as supporting the Nile Basin Initiative, Norway has an institutional cooperation with Ethiopia's Ministry of Water and Energy. Norway is also supporting the Ethiopian-based initiative for a regional energy market, the Eastern African Power Pool (of which Gibe III Dam is a central piece), as well as Ethiopian energy projects through multilateral fund EnDev. Ethiopia also receives support from Norway under the Energy+ Initiative (see subsequent section). Norway has pledged 500 million NOK (US\$ 83 million) to Ethiopia through the initiative

over a five-year period. In 2012, Norway entered into a new cooperation with Ethiopia to strengthen Norwegian involvement, which, it is hoped, will leverage dialogue on human rights. The Norwegian Minister of International Development traveled to Ethiopia to sign the new agreement, but made no progress towards solving the crisis in Norway's institutional cooperation.

Norway's institutional cooperation with Ethiopia's Ministry of Water and Energy is managed by NVE. The cooperation agreement, signed in 2009 for 135 million NOK, consists of Norwegian support for feasibility studies, developing the EIAs of two hydropower dams on the Nile (Mandaya and Beko-Abo, mentioned above), and capacity-building for the Ministry of Energy. A mid-term review of NVE's performance concludes that the cooperation has shown few results²¹.

There has been very little progress in capacity building over the first two years within the Ethiopian ministry. The feasibility studies and environmental and social impact assessments undertaken for the Mandaya and Beko-Abo dams are probably the biggest setbacks of the cooperation. As mentioned above, the 2000 MW Mandaya project and the 2100 MW Beko-Abo project were sought to be made bankable by the Norwegian Ministry of Foreign Affairs, yet the site for the Mandaya Dam will be submerged by the proposed Grand Renaissance Dam. Norwegian officials were not informed about these plans before they were made public in March 2011. That no Norwegian official had been informed of the news before March shows the weakness of Norway's institutional cooperation, and the Ethiopian government's seemingly superficial interest in Norwegian participation. Following the announcement of the Grand Renaissance Dam, NVE's studies were put on hold until further notice.

Bright futures, ideal intentions and broken promises

When Norway entered into its ongoing cooperation with Ethiopia in 2009, the Norwegian Ministry of Foreign Affairs' assessment of the Nile Basin Initiative was that the countries were "well on their way towards signing a cooperation agreement that can eventually pave the way to a Nile Commission." Nonetheless, one year later, five riparian countries created a framework agreement excluding the downstream countries Egypt and Sudan. Commenting on this, Norwegian officials stated "our reading is that Egypt and Ethiopia cooperate closely and constructively at the technical level regarding development of investment projects on the Blue Nile."²² The statement shows a clear belief in the work of the Nile Basin Initiative, yet is starkly contrasted by Ethiopia's unilateral decision less than a year later to announce the Grand Renaissance Dam. The two Norwegian-supported dams have been treated idealistically in the NBI; now that these projects are "flat-lined" it is due time to ask whether dialogue is improving conditions in the Ethiopian hydropower sector.

Despite the obvious problems caused by the Ethiopian government, Norway seems intent to stay on path due to their interest in introducing Norwegian hydropower operators in Ethiopia. Norway used a 2011 IHA conference in Addis Ababa to promote Norwegian "best practices" as illustrated by the Nordic Power Pool and SN Power's experience with hydropower. Significantly, however, none of SN Power's existing projects are close to the size of dams planned in Ethiopia. Meanwhile, SN Power has stated that they do not intend to divert their focus from Southern Africa for the time being.

Corporate Involvement

Though Norwegian actors have a smaller share in overseas dam building compared to China's Sinohydro, or Brazil's Odebrecht, there are several Norwegian state-owned companies active in overseas hydropower. The two main protagonists are the investment fund Norfund and the government hydropower company Statkraft. SN Power, a subsidiary of Norfund and Statkraft, is also a major operator. In recent years, regional hydropower companies such as Trønderkraft have engaged in overseas dam building as well. The Norwegian state export credit agency, GIEK, is also involved in lending to hydropower. Norwegian contractors such as Veidekke and Kværner Energy have also been involved in international hydropower. Veidekke downscaled their international ambitions after controversies surrounding dam projects in Uganda and Kværner Energy ceased existing as a Norwegian company after a merger and division of Kværner in the first decade of 2000. Below is a short description of the three major contributors – Statkraft, Norfund and SN Power – and some examples of controversial projects in which they have participated.²³

Statkraft

Statkraft is a major European power company and a leader in renewable energy. Statkraft is active in wind, gas and bio-thermal as well as its main activity, hydropower. Statkraft has an annual production of 51 tWh, and has power production in four European countries beside Norway. Statkraft also operates power plants in Turkey and Laos. Through Statkraft's equity in SN Power, it owns over 20 hydropower plants overseas. In 2011, Statkraft invested US\$ 160 million in hydropower internationally. Statkraft utilizes the IFC Performance Standards to manage their international operations, but this has not prevented the company from facing controversy.

Turkey is a focus area of Statkraft's international growth. Statkraft has bought the Turkish company Yesil Enerji,

whose portfolio includes three hydropower projects, including the Cetin Project with a planned capacity of 517 MW.

Theun-Hinboun hydropower plant

In Laos, Statkraft operates the Theun-Hinboun hydropower plant, and has been responsible for the Theun-Hinboun Expansion Project. The project has affected 50,000 people in the reservoir area and downstream. Once completed, the power plant will be able to produce 500 MW, close to 90% of which will be exported to Thailand. The project has been criticized for breaching the IFC Performance Standards on several counts, and hence the Equator Principles, to which several of the project's financiers adhere. The project has breached Laotian law due to its inability to settle unresolved issues such as compensation from earlier construction before commencing on the new expansion project. A field study by International Rivers in September 2011 uncovered several concerning issues and a letter sent to Theun Hinboun Power Company and Statkraft in February 2012 confronts the company with several breaches of IFC Performance Standard 5 concerning resettlement and compensation. The project developer is criticized for having not planned community resettlement, and for having avoided the resettlement action plan. Similarly, Statkraft refers to many of the affected people as "relocated" rather than as "resettled," and has refrained from giving them the full rights due to resettled people.²⁴

Norfund

The Norwegian Investment Fund for Developing Countries, Norfund, invested a total of US\$ 366 million in 2011.²⁵ One of Norfund's main investment areas is renewable energy. Norfund has also invested in and has provided loans for financial institutions with a development mandate. Funds that lend to small and medium-



Theun Hinboun Dam in Laos. Foto: FIVAS

sized enterprises received US\$ 28.6 million in investments from Norfund in 2011. Norfund's major stake in hydropower is its 40% ownership in SN Power. Norfund invested US\$ 171 million in new equity in the company in 2011, bringing its total share in the company to US\$ 656.6 million. Norfund also owns energy subsidy Agua Imara together with SN Power and several others, and invested US\$ 22.6 million in the company in 2011. Also in 2011, Norfund supported Guatemalan energy company Hidro Santa Cruz, Trønder Power's Bugoye hydropower project in Uganda, and three small-scale projects through Kenya's Hydel Hydropower. Norfund is also channeling Norwegian aid to the Nam Sim hydropower project in Laos, operated by the Nam Sim Power Company Limited, through the Nordic Environment Finance Corporation (NEFCO). Norfund is also holding equity in or lending to several funds directed towards renewable energy and infrastructure; two of these are the infrastructure investment fund CIFI and the clean energy entrepreneur fund E+CO.

Controversies

Norfund adheres to the IFC Performance Standards and is primarily engaged in small hydropower. Yet, there has still been controversy around their investments, and they have been criticized for an unclear commitment to indigenous peoples' rights. In spite of previous cautions from civil society and the violent history of hydropower in Guatemala, Norfund has invested in Hidro Santa Cruz in Barillas in Guatemala. The Santa Cruz hydropower project is planned according to the IFC Performance Standards and the developer has accordingly held consultations with the community and with indigenous groups. Yet, in spite of the consultations, there has been significant protest against the project during 2012. The parent company has attempted to mediate the conflict, but the severity increased when activists were assaulted and killed by unknown perpetrators²⁶. Following these incidents, a military-enforced curfew was imposed in the area.

Hydropower Plants Operated by SN Power

Panama:

Bajo Frio – 58 MW commissioning 2014 (Agua Imara)

Peru:

Cheves hydropower plant – 168 MW, under construction.

Arcata hydropower plant, 5 MW

Cahua hydropower plant, 43 MW

Gallito Ciego hydropower plant, 37 MW

La Oroya hydropower plant, 9 MW

Malpasso hydropower plant, 54 MW

Pachachaca hydropower plant, 9 MW

Pariac hydropower plant, 5 MW

Yaupi hydropower plant, 108 MW

Chile:

La Confluencia hydropower project, 158 MW

La Higuera hydropower plant, 155 MW

Nepal:

Khimti I hydropower plant, 60 MW

India:

Allain Duhangan 192 MW

Malana hydropower plant, 109 MW

Sri Lanka:

Assupiniella hydropower plant, 4 MW

Belihuloya hydropower plant, 2 MW

Philippines:

Binga Power Plant – 100 MW, under upgrade to 120 MW.

Ambuklao hydropower plant, 105 MW

Magat hydropower and irrigation dam, 381 MW

Zambia:

Lunsemfwa power station 18 MW

Mulungushi power station 28,5 MW

(Agua Imara owns 51 % of Lunsemfwa Hydropower Company, which operates the two plants)

SN Power

SN Power is a commercially-driven state-owned company that invests in hydropower in emerging markets. 60% of SN Power is owned by Statkraft and 40% by Norfund. The company has a total production capacity of 992 MW and seeks to develop to 3000 MW by 2015. Like Norfund and Statkraft, SN Power adheres to the IFC Performance Standards. SN Power and its subsidiary Agua Imara hold ownership in 20 overseas hydropower plants in eight countries, and is currently constructing two plants, the Bajo Frio in Panama and the Cheves in Peru. SN Power is also developing prospects in Brazil and Vietnam.

Formerly known as SN Power AfriCA, Agua Imara is a subsidiary of the SN Power Group. Agua Imara is owned by SN Power, Norfund, and the regional hydropower companies BKK and TrønderEnergi. Agua Imara is establishing in Zambia, Panama and Mozambique.

In Vietnam, SN Power entered into an agreement with the International Finance Corporation (IFC) to develop up to 1GW of hydro power capacity over a ten-year period.

In Brazil, SN Power also owns a 40.65 percent stake in Brazilian power company Desenvix, owned by the pension fund of Brazilian public bank Caixa Econômica Federal (Funcef). Desenvix, the power generation arm of

the Brazilian engineering company Engevix, has a portfolio of renewable energy assets of 162 MW in operation, 176 MW under construction, as well as a large portfolio of projects under development of about 1,600 MW. The assets are mainly hydropower, but also include two wind farms and a biomass plant under construction. The transaction also includes Desenvix's 50 percent shareholding in Enex, a company specializing in operation and maintenance of small and medium sized hydroelectric plants.

In Zambia, SN Power ACA Holdings of Singapore has been granted approval by Zambia to acquire 51 percent equity in Lunsemfwa Hydropower Company. Wanda Gorge Investment, which owned 99 percent before the transaction, will retain a 49 percent stake.

SN Power withdraws after conflict in Chile

SN Power was under strong criticism for its planned investments in the 400 MW Maqueo Dam and three other dams in Southern Chile. The developers and the Chilean state have been in conflict with Mapuche indigenous groups in the area. Mapuche groups maintain that the project will violate their territory and communal rights, such as the right to water, and claim that the Chilean state does not respect their rights as protected by ILO Convention 169. In 2011, after developing five years of project studies, SN Power sold its share of the dam to their Chilean partner Centinela.

Government Pension Fund Investments²⁷

Norway supports global hydropower development by holding equity and securities in foreign companies and financial institutions involved in the hydropower sector. However, many of these institutions have participated in highly controversial projects, including in Brazil, South-east Asia, and elsewhere.

The **Norwegian Government Pension Fund** is an investment fund managed by Norges Bank Investment Management (NBIM) that regularly receives capital from Norway's petroleum revenues. The Fund invests in global equity, securities, and real estate markets with a focus on long-term growth and a tolerance for medium risk. The Fund exclusively invests abroad in order to protect pensions from fluctuations in oil prices that could destabilize value, and to avoid domestic investments that might overheat the Norwegian economy.

Despite its name, the Fund serves no function for payment of pensions to Norway's aging population. Rather, the Norwegian government utilizes the Fund as a savings investment account that could support future government pension liabilities when they arise.

The Fund invests heavily in the global hydropower sector. As of 2012, the Fund's largest equity holdings were in global dam builders and financiers in France, Germany, Brazil, and Spain (see box). The Fund's largest securities holdings were in regional and international development banks, such as the European Development Bank, and then global dam builders and financiers in Canada, Spain, Brazil, the Netherlands, and France (see box). Altogether, these holdings were valued in 2012 at 60,589,634,195 NOK, or US\$ 10,014,309,678 in equity, and 67,700,739,978 NOK, or US\$ 11,189,639,397 in securities. Together, the Fund's holdings in companies and institutions active in hydropower development total more than 127 billion NOK, or over US\$ 21 billion.

Many of the companies and institutions in which the Fund invests have been involved in controversial hydropower projects. GDF Suez is the leading partner in the Jirau Hydropower Plant on Brazil's Madeira River, financed by Banco Nacional de Desenvolvimento Econômico e Social, Banco do Brasil, and Banco Santander. In 2011, two separate labor strikes occurred after workers reported non-payment of wages and lack of medical attention. The strikes resulted in the burning of plant equipment and trucks, delaying construction for a number of weeks, and costing the consortium millions of dollars. Jirau Hydropower Plant has also led to increases in deforestation and indirect impacts on nearby indigenous tribes.

Centrais Elétricas Brasileiras S.A. (Eletrobras) is the leading partner in the Belo Monte Dam, under construction on Brazil's Xingu River since 2011. The Belo Monte Dam is financed by Banco Nacional de Desenvolvimento Econômico e Social, Brazilian pension funds, and others, and its developer consortium includes Vale, Light, Alstom, Siemens, and Odebrecht, among others. The construction sites have twice been occupied by hundreds of indigenous tribes during 2012, as tribes demand a cancellation of the project on the grounds that indigenous people were not properly consulted, and that the Norte Energia, S.A. consortium has not implemented the requisite mitigation actions of the project's environmental license. The Xikrin do Bacajá tribe, for example, have noted that Belo Monte will cause substantial downstream impacts on the Bacajá River, which the tribe depends on for water consumption, transport, and trade. The dam currently faces over a dozen lawsuits.

The multilateral financial institutions in the Fund's holdings have long invested both directly and indirectly in large hydropower. The Asian Development Bank and the World Bank, for example, along with Electricité de France, supported the construction of the controversial

The Fund's Top Equity Investments in Companies Active in the Hydropower Sector

France (16,432,930,491 NOK):

Alstom
Electricité de France (EDF)
GDF Suez
Schneider Electric
Suez Environnement

Germany (16,144,881,581 NOK):

E.On
Siemens

Brazil (11,698,194,839 NOK):

Banco Bradesco SA
Banco do Brasil SA
Banco Santander
Camargo Corrêa Desenvolvimento Imobiliário Sa
Centrais Elétricas Brasileiras SA
Cia Energética de Sao Paulo
EDP - Energias do Brasil SA
Gerdau SA
Itau Unibanco Holding SA
Itausa - Investimentos Itau SA
Light SA
Tractebel Energia SA
Vale SA

Spain (10,755,676,645 NOK):

Banco Santander SA
Iberdrola SA
Mapfre SA

Nam Theun 2 hydropower plant in Laos. The African Development Bank has supported the Bujagali Dam on Uganda's Nile River.

Kasikornbank, Siam Commercial Bank, Krungthai Bank, and Bangkok Bank are banks that are instrumental to the financing of the Xayaburi dam in Laos. The Funds hold equity in all of these banks. The Xayaburi dam is planned as the first dam on the Mekong mainstream and is expected to cause severe, widespread and irreversible environmental damage with grave consequences to human life and health in Laos and the neighboring countries.²⁸

Ethical Management of the Fund

The Fund is bound by ethical guidelines, and the advisory Council on Ethics can recommend companies for exclusion or observation due to breach of the ethical guidelines. The recommendations are considered and effected by the Ministry of Finance. The ethical guidelines cover issues such as serious human rights breaches, gross environmental destruction and gross corruption. The Council have in 2011 had a specific focus on hydropower and are reportedly concerned about some of the companies in the industry. The profile has therefore reportedly been to avoid the worst in this sector. However the assessments done by the Council is kept secret and the handling organization NBIM is not open about what companies are considered for investment. As we can see from the list beneath the Fund is still holding shares in a considerable amount of problematic projects and in some quite dubious companies. This seems contrary to a policy where avoiding bad players in the hydropower industry is a priority.

Alstom, S.A. is one of the world's most prolific turbine manufacturers and suppliers, and has participated in



Tribes occupy the Belo Monte work site.
Photo: Marcelo Salazar



Construction of the Belo Monte Dam, Altamira, Brazil. Foto: Minplanpac

scores of controversial hydropower projects, including Jirau Dam and Belo Monte Dam. Alstom is one of the companies that have received a recommendation from the Council, and it has now been under observation since December 2011, due to suspicion of gross corruption. The recommendation was given in 2010, but was only first acted upon in December 2011. This shows one of the weaknesses of the ethical work in the fund. Alstom is also already convicted of corruption in Mexico and charged with corruption in four different European countries. A lengthy observation seems like an excuse rather than action in this case.



Tribes free the Xingu river from an existing coffer dam. Photo: Atossa Soltani

The Energy+ Initiative

The process and Norway's role

The Energy+ Initiative is a Norwegian side initiative to the UN Sustainable Energy For All (UN-SEFA) initiative and the UNFCCC, and is to a large extent molded by the Norwegian Ministry of Foreign Affairs. Similar to REDD+, the initiative seeks to be developed independently of the UN. The Ministry is probably lending an ear to other donors in the partnership, such as the UK and France, but it seems that Norwegian funding of the project has driven its launch in pilot countries. The initiative also has an international working group on indicators, with NGO participation.

The Rio+20 Summit was an important arena for the initiative, where Norway made commitments of 500 million NOK to Ethiopia, 250 million NOK to Kenya, and 100 million NOK to Liberia over five years.²⁹

Institutional arrangement and mode of support

The Energy+ partnership has so far been open to everyone (see box); developing countries, developed countries and organizations are among the members. Energy+ intends to build up a fund of donor money accessible to developed countries within the partnership. Developed countries that enter as partners are expected to be donors to the fund, and developing countries are expected to show “strong political will” to achieve the partnership goals. The initiative is not a formal part of the SEFA or the UN umbrella, but seeks to inform the SEFA and UNFCCC processes. A connection to the Green Climate Fund and leverage for financing through the CDM are possibilities.

Energy+ will support several forms of energy development. The initiative uses the terms “modern energy” and

List of members: (As of June 2012)

- Developing countries: Kenya, Bhutan, Liberia, Ethiopia, Maldives, Senegal, Morocco, Tanzania, Nepal, Mali
- Developed countries: United Kingdom, France, Denmark, Switzerland, The Netherlands, Republic of Korea, Iceland, Norway
- International financial institutions: World Bank Group, Asian Development Bank, African Development Bank, Inter-American Development Bank
- United Nations: United Nations Environment Programme (UNEP), United Nations Development Programme (UNDP), United Nations Industrial Development Organisation (UNIDO)
- International organisations: International Energy Agency (IEA), Organisation for Economic Co-operation and Development (OECD), Global Village Energy Partnership (GVEP), ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE), Latin American Energy Organization (OLADE), International Hydro-power Association (IHA)
- Business: World Business Council on Sustainable Development (WBCSD)
- Foundations: United Nations Foundation (UNF)
- “Think-tanks”: Centre for Clean Air Policy (CCAP)
- Civil society: World Wildlife Fund, Friends of the Earth Norway, Practical Action UK, World Future Council, Bellona

“clean energy.” Whether these terms refer to climate-friendly or renewable technologies, or both, remains unclear. The “Principles of Energy +” released under the high level conference in Oslo October 2011 state that activities will support “low carbon development strategies and poverty reduction strategies”. Energy+ aims at leveraging private funds to release private investments several times larger than public development assistance spent during the initiative.

Sectoral approach and results-based financing

The initiative will consist of programmes on a sectoral level, and results-based funding is promoted as a central instrument. This means that countries participating in Energy+ will likely be asked to develop a national energy plan.

Results-based finance will mean that funding is released after reaching specific targets. Indicators are an important

Principles of Energy +

- Developing country actions in the energy sector will be supported through best-practice policy reforms, technical support and at scale results-based financial investments to increase access to renewable energy and improve energy efficiency, and avoid/reduce emissions of greenhouse gases relative to a business-as-usual baseline;
- Activities will be country driven and support low carbon development strategies and poverty reduction strategies of developing country partners;
- The private sector can help support energy development, and can bring in much-needed finance, but only where there is a supportive policy and regulatory environment. Governments can use policy and regulatory tools to promote significant investments, allowing scarce donor and domestic public resources to be dedicated to solving market failures, targeting the poor, and supporting innovation;
- Recognizing the constraints on the availability of public funds and the need for private investment, Energy+ will adopt a results-based approach to both catalyzing action on the ground and the achievement of results at the national level;
- Energy+ will employ a three-phased approach to country engagement – see below
- The use of results-based approaches will necessitate the development of robust indicators to measure outputs, outcomes and impact. In some cases this will necessitate the strengthening of country reporting systems, coordination mechanisms at national and international levels, establishment of country-level tracking systems (e.g. registry) for renewable energy and energy efficiency investments and international agreement on definitions and methodologies; and
- Wherever possible, Energy+ Partners will work through existing programmes and institutions, thereby limiting transaction costs and speeding up progress.

instrument to ensure the implementation of pro-poor alignment and environmental risk management actions. The development of a set of indicators for all programmes is under way, and was presented at the UN's Rio+20 Summit in 2012. It is unclear whether these will converge into a short list of three indicators ensuring pro-poor energy access, electricity for industrial development and a high-renewable component, or a longer, more exhaustive list of indicators.

Contradictory goals

Energy+ aims at leveraging private funds, and its proponents have been heard stating that “every dollar spent should release seven dollars of private investment, or *at least four*.” How this informs programme design has not been discussed. Energy+ is intended to reach the poor through development and application of specific pro-poor indicators. Yet, designing universal indicators for commercially-viable electricity distribution to a diverse range of poor populations is a large leap of faith. It remains to be seen what kind of modern energy will be

available for the rural poor in off-grid areas in Energy+ countries.

Will Energy+ Finance Controversial Dams?

Energy+ may not finance controversial large hydropower projects. Norway announced at the Rio+20 Summit that the first pilot projects will include Ethiopia, Kenya, Liberia and India. As a result, it seems that small- to mid-sized projects are preferred; but this is far from certain. It is entirely plausible that controversial hydropower projects may find their way into the Energy+ project pipeline.

Multilateral Policy Dialogues

Norway also promotes the global hydropower sector through multilateral policy dialogues. Such initiatives include the Sustainable Development of Hydropower Initiative of the Clean Energy Ministerial, the research of the International Energy Agency, the research of Norway's International Centre for Hydropower (ICH), Norway's influence at the World Bank and IFC, and Norway's support for the International Hydropower Association's (IHA) Hydropower Sustainability Assessment Protocol (HSAP).

The Government of Norway is one of five countries that participate in the Sustainable Development of Hydropower initiative of the Clean Energy Ministerial, together with the International Energy Agency.³⁰ The Clean Energy Ministerial has met every year since 2010 to “advance international collaboration to accelerate the adoption of clean energy technologies worldwide. Energy ministers from 23 participating governments come together to assess progress and guide work under 11 concrete, transformative clean energy initiatives. Ministerial meetings also provide an opportunity for high-level engagement with private-sector stakeholders in a variety of formats, ranging from public panel sessions to roundtable dialogues, co-chaired by ministers and chief executive officers.”³¹

More broadly, Norway participates actively in the research agenda of the IEA. As part of the IEA agenda for 2010-2015, a Statkraft representative leads the IEA's efforts to “establish economic values for water and energy services provided by storage hydro beyond the production of electricity.”

Based in Trondheim, Norway's own research institute, the International Centre for Hydropower, conducts research and offers workshops and courses to sector professionals.³²

Norway also plays a strong role in highlighting the benefits of hydropower in policy revisions at the World

Bank. The Government of Norway took a position during a 2010 consultation on the World Bank's Energy Strategy that “all forms and sizes of hydropower projects are regarded as renewable energy, and the WBG is seen as having good safeguards for large hydro. Climate change will change hydrology, perhaps making water storage and flood control increasingly important in building dams. Hydropower can also protect upstream rainforests. Norway referred to the Pangani dam in Tanzania, where there was less water available, not because of global warming but because change in land use on the hills of Kilimanjaro (forestry) has reduced water flow and thereby power production. Hydropower companies would have incentives to protect rainforests upstream. Norway also pointed out that different types of hydropower projects (run-of-river, storage) meet different needs and significant progress has been made in the past years in the area of sustainability.”³³ In 2010, Norad held a conference with the World Bank, titled “Modernizing Hydropower.”³⁴

Norway convenes and sponsors multiple conferences around the world dedicated to discussing hydropower. For example, in 2011, the Government of Norway hosted a high-level conference on “Energy Access and Finance.”³⁵

Norwegian Support for the Hydropower Sustainability Assessment Protocol

Norway is also a principal funder of the International Hydropower Association (IHA), a hydropower industry special interest group that promotes global hydropower development. Norway's financial support to IHA helped create the Hydropower Sustainability Assessment Forum (HSAF), an initiative between the IHA and WWF, The Nature Conservancy, Transparency International, and Oxfam that between 2008-2010 created the Hydropower Sustainability Assessment Protocol (HSAP). The HSAP is an auditing framework for use by hydropower developers to voluntarily assess the social and environmental sustain-



Construction of Bakun Dam, 2009.

Photo: Cahaya Dalam Kegelapan

ability criteria of their dam projects. Norway continues to support IHA in the development of HSAP, including through grants for assessment training programmes. IHA have also applied to Norway to fund national HSAP implementation pilots in developing countries.

Norwegian dam builder Statkraft is one of eleven “Sustainability Partners” that have committed to using HSAP to assess at least one of their dam projects. SN Power, also of Norway, has explored using the HSAP on its projects as well. “Sustainability Partners” commit to utilizing the HSAP to undertake one unofficial, and one official, HSAP assessment. Official HSAP assessments must be published for a 60-day public comment period at the website www.hydrosustainability.org.

Despite their subscription to the HSAP’s “Sustainability Partners” programme, many of these hydropower developers have been noted for social and environmental rights violations in the sector. Sarawak Energy, for example, was responsible for forced displacement of tens of thousands of indigenous people during the construction of the Bakun Dam between 1996 and 2011. Today, Sarawak Energy is planning on building twelve more dams in Sarawak, including the Murum Dam, the Baram Dam, and the Balleh Dam, which will similarly displace thousands of indigenous people.

Other companies that participate in this corporate sustainability public relations campaign already receive other forms of support from Norway, as previously noted. Such is the case of E.On, EDF, GDF Suez, and Statkraft, for example. Odebrecht, one of the world’s largest construction firms, participated in the destructive Dardanelos Dam in Brazil, where the firm’s subsidiary Aguas de Pedra dynamited an indigenous tribe’s cemetery after failing to include the cemetery’s location in the project’s environmental impact assessment. The tribe

A Voluntary Approach to Sustainability Reporting

The HSAP takes a different approach to sustainability than the Recommendations of the World Commission on Dams (WCD), the leading sustainability guidelines for the hydropower sector. The WCD promotes a precautionary approach of careful planning in the energy and water sectors, while the HSAP is a voluntary, non-binding sustainability scoring system that only evaluates the performance of dam builders during project development, implementation, and operation. In contrast to regulatory policies, the HSAP has no ability to penalize developers if they do not meet the requirements of national laws or international best standards. Instead, HSAP seeks to incentivize dam developers by rewarding them with high scores and potential public relations benefits. However, the HSAP contains no mechanism to guarantee the objectivity of project assessors nor the objectivity of an assessment’s evidence base, so conflicts of interests may taint the objectivity of HSAP assessments. As a result, civil society and dam-affected peoples are concerned that HSAP assessments will greenwash the impacts of particularly destructive dams.

HSAP Sustainability Partners:³⁶

- E.On (Germany)
- Electricité de France (EDF)(France)
- GDF Suez (France)
- Hydro Equipment Association (USA)
- HydroTasmania (Australia)
- Itaipú Binacional (Brazil)
- Landsvirkjun (Iceland)
- Manitoba Hydro (Canada)
- Odebrecht Energia (Brazil)
- Sarawak Energy (Malaysia)
- Statkraft (Norway)

occupied the project for two weeks, threatening to set it on fire, as a result.

All in all, many of the eleven companies that participate in the HSAP programme have a tainted sustainability record. The voluntary, non-binding nature of HSAP auditing is unlikely to greatly improve these companies’ social and environmental practices, and it remains to be seen whether Norway’s support will improve these companies’ capacities to do so.

IV Norway's Support for Emerging Renewables Markets

Norway's special expertise in renewable energy production has allowed the Norwegian Government to promote hydropower as its primary contribution to global development cooperation. However, Norway is also poised to leverage its expertise in the growth of today's emerging renewables markets. These markets provide Norway with new options for development aid to growing economies, while simultaneously providing investment opportunities that are more socially and environmentally friendly than large dams.

Several of Norway's government-owned corporations are active in new, emerging forms of renewable energy. Branching into new renewables shows a will by many of the agents in the energy sector to increase innovation and to seek better alternatives. Development of new renewables such as wind and solar in Norway have had difficult terms competing with a burgeoning oil industry. Yet, in development cooperation, these markets are still considered greenfield investments, and can hardly be sidelined by Norway's traditional focus on petroleum for development or its broader engagement in hydropower.

Solar Energy

The IEA estimates that global solar energy markets have grown 42% over the past decade, while costs have decreased up to 75% in some countries.³⁷

Norfund in 2012 signed an agreement to invest USD 5.5 million in ToughStuff, a provider of affordable solar-powered energy solutions to users in developing countries. The investment gives Norfund an ownership interest of up to 27 per cent.³⁸ ToughStuff has developed an inexpensive solar panel that can be used to charge a lamp, power a radio or charge cell phones. Since 2009, ToughStuff has sold over 700,000 products, mainly in Madagascar and East Africa. Norfund's investment will contribute to a further expansion in Eastern, Southern and West Africa.

Norfund has also invested in the CASEIF II solar project in Nicaragua, and in the China Environment Fund 2004, which has supported solar energy.

Statkraft, meanwhile, has partnered with Siemens Energy to invest in the 3.3 MW Casale solar photovoltaic (PV) power plant in Italy. The companies agreed in 2010 to build 40 MW of solar power capacity in the rest of Italy.

Wind Power

The IEA estimates that global wind energy markets have grown 27% in the past decade, and the trend is set to continue through 2016.³⁹

Norfund is a partner in the consortium to build the The Lake Turkana Wind Power project in Kenya. The wind power project is expected to generate 300 MW for Kenya's electricity grid, replacing a percentage of hydropower. Kenya currently relies overwhelmingly on hydropower, but climate change has reduced the inflow rates of Kenya's reservoirs, presenting a problem to the sustainability of Kenya's dams, and presenting a good opportunity for increased investment in the wind sector.

Since 2008, Statkraft has concentrated the development of Norwegian, land-based wind energy projects in SAE Vind, a joint-venture with Agder Energy. In Sweden, Statkraft is collaborating with a number of partners to develop wind energy. In the UK Statkraft is developing wind energy both on land and offshore. SN Power owns the 45 MW Totoral wind farm in Chile.

Finally, Norwegian oil and gas company StatoilHydro has teamed up with German infrastructure giant Siemens to build the first floating wind turbines for deepwater use.



Solar Panels. Photo: Statkraft

Geothermal Power

In many countries, geothermal energy represents the largest, and best potential for energy investment.

Norfund owns two international geothermal plants: the Tanggu Geothermal Plant in China, and the Leyte-Cebu Geothermal Plant in the Philippines.

In its 2010 annual report, Norad reported 0% investment in geothermal, compared with only 1% in wind, and 2% in solar.

Small Hydropower⁴⁰

Small hydropower may still cause large, cumulative impacts to freshwater systems, especially when cascades of small dams are planned in a single river basin. Yet, in certain cases, small hydropower may be a better option than large storage hydropower.

Several Norwegian commercial interests are involved in small scale hydro of 10 MW and lower. Meanwhile, Statkraft have awarded support to a Norwegian NGO to build micro-scale hydropower in Myanmar.

New Initiatives

In 2012, Norway was a founding member of the Global Green Growth Institute (GGGI).⁴¹ This new international organization creates the potential for Norway to share financial support and know-how for truly sustainable water and energy solutions such as those sectors listed above. Norway could use its global influence to make sure that GGGI excludes large hydropower in favor of other, more viable options for renewable energy.

V Conclusions and Recommendations

This report has attempted to survey the diverse areas of Norwegian involvement in international hydropower. We have tried to show that this support is formed both by altruistic ideas and problematic practices. It is not possible to sum up into a general statement whether Norwegian engagement is good or bad. However, we find it prudent to make some general remarks, based on the country's broad range of experience.

In its bilateral support, Norway's institutional and sectoral policy aid through such actors as NVE and Statnett has typically sought to address issues of "good governance". However, though reportedly building on experiences from Norway's own development, Norway's approach to governance in development aid sidesteps intrinsic political concerns that are central to development aid, in favour of a merely technical engagement. Engagement with the Ethiopian hydropower sector, for example, has not responded to the country's record in human rights violations. Similarly, Norway's institutional support in establishing a regional energy market in Eastern Africa avoids political conflicts among Nile Basin Initiative countries, among others. Such an approach, where politics becomes a mere appendage to development finance rather than a central concern, cannot successfully abate human rights challenges in borrower countries.

In Norway's corporate involvement, "best practice" seems to be a common mantra. Perhaps idealistically, Norwegian dam builders attempt to follow international standards – Statkraft has made significant strides in mitigating the negative impacts of dams in Laos, for example, while companies have attempted to meet the requirements of the IFC Performance Standards when projects involve impacts on indigenous peoples in Latin America. Similarly, in multilateral stakeholder dialogues, Norway carefully presents its international cooperation as meeting high international standards, aiding in the creation of voluntary

best practice guidelines. Sometimes, Norway has claimed that its support helps foster human rights dialogue. At face value, this is good performance.

Nevertheless, controversies arise, and implementation of "best practice" often creates unwanted outcomes. To foresee risks, challenges, and crises such as those encountered by Norwegian actors in Ethiopia and Guatemala, for example, a more political, not technical, approach is needed. Issues of water and energy infrastructure, after all, are issues of power. For example, greater political discernment could be exercised in the asset management of Norwegian Government Pension Fund, which holds significant equity and bonds in companies that have been cited for their involvement in risky, controversial, and costly hydropower projects. Strong human rights benchmarks and policy standards could be adopted in emerging initiatives such as Energy+, including prescriptions for project selection and social and environmental safeguards.

It is important to note that Norway does not promote hydropower solely for altruistic aims. Norway's assertive promotion of hydropower intends to open up investment opportunities for Norwegian commercial interests. It is not by chance that Norwegian companies are commercially active in countries that receive Norwegian aid, such as Uganda. Norway's broad engagement in the Ethiopian energy sector is driven by a clear intention to create market opportunities for Norwegian operators and contractors. Such a mercantilist approach need not be negative, but it is important to bear in mind when considering Norwegian aid and its consequences.

Given its recurring problems, we find it difficult to conclude that Norwegian involvement in the global hydropower sector raises its overall standard. What is certain is that it raises the overall amount of activity, and investment, in the sector.

Norway will continue to play a significant role as a global player in energy development. But, with this role comes responsibilities. Knowledge brokers must wield political, social, and cultural savvy, as well as technical expertise. Such an integral approach is more important than ever, as borrowers now enjoy greater abilities to finance their own development.

Meanwhile, hydropower can create significant impacts to the environment and the climate, and dams may be built on a whim to power industrial users in a risky commodities market, only to develop more costs than benefits. As a result, hydropower should not blindly serve as the basis of “green growth” strategies; instead, caution should be exercised in both rhetoric and policy, especially in Norway’s support for international organizations.

Norwegian players must improve the outcomes of their support by adopting policies that hold borrowers accountable to the highest enforceable international social and environmental standards. Implementing such reform would also help reduce Norwegian actors’ exposure to risk. To the right are five policy recommendations to lead Norway to higher ground.

It is clear that as diverse stakeholders launch efforts to scale up “green growth” in low- and mid-income countries, Norway’s role as both a direct investor and knowledge broker in hydropower development has been significant. Yet, it is also clear that Norwegian aid has gone to corrupt and repressive governments, supported the growth of risky, energy-intensive industries, and financed controversial large dams, many of which have caused significant impacts. To improve the effectiveness of Norwegian aid, to improve borrower and Norwegian corporate performance, and to reduce risk, a greater commitment to the implementation of human rights and the highest social and environmental standards is called for, now and in the future.

Recommendations

1 **Improve Borrowers’ Capacity for Upstream Risk Management**

- Create incentives for borrowers to adopt best practices in areas such as cumulative environmental and social impact assessments, participatory river basin planning, options and needs assessments, and environmental flows assessment.

2 **Engage With Borrowers Over Human Rights**

- Tie support to governments marked by high corruption and repression to results-based improvements in political concerns and human rights.

3 **Improve Corporate Social and Environmental Performance**

- The performance of Norway’s corporate actors can be improved by adopting the recommendations of the World Commission on Dams. A few areas include:
 - *Biodiversity*: Dams proposed for biodiversity hotspots, protected areas, and internationally significant wetlands should be left off the table. Rivers rich in migratory species are especially inappropriate for dams and should be deemed off-limits.
 - *Rights*: Implement indigenous peoples’ right to Free, Prior, and Informed Consent (FPIC) and consultation, avoid large-scale resettlements, and guarantee transparency, access to information, and participation in decision-making for affected communities.
 - *Climate change*: Incorporate accurate climate change projections to flow duration curves and cost-benefit analyses. Account for the greenhouse gas emissions of hydropower infrastructure and associated facilities, such as transmission lines.

4 **Diversify Pension Fund Holdings**

- The assets of the Norwegian Government Pension Fund should be diversified away from large, established, and often controversial hydropower companies, towards smaller and less controversial businesses, despite perceived investment risks.

5 **Increase Sectoral Support for Emerging Renewables**

- Norway could help unlock potential for growth in emerging renewable technologies, such as solar, wind, energy efficiency, and geothermal energy, by forming bilateral and corporate partnerships in order to reduce risk for private investors.

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