CTF PRIVATE SECTOR PROPOSAL

Name of Project or Program	Thailand Renewable Energy Accelerator Program (the "Program")
CTF amount requested	➢ Investment – up to US$39 million equivalent ➢ Advisory services grant component – US$500,000 ➢ Implementation and supervision budget - US$500,000
Country targeted	The Kingdom of Thailand
Indicate if proposal is a Project or Program	Program

DETAILED DESCRIPTION OF PROGRAM

Proposal Context:

The proposal is for a programmatic initiative to promote transformation of, and private sector development in, Thailand's sustainable renewable energy (RE) sector. On December 2, 2009, Thailand's Country Investment Plan (CIP) was endorsed by the CTF Trust Fund Committee. Thailand's CIP indicated that the development of renewable energy resources was a key strategic area to apply CTF resources, including through direct private sector initiatives, and the CIP allocated US$70m to IFC for such initiatives. IFC's first programmatic proposal under the CIP is targeted at advancing direct private sector investment in RE projects. In addition to IFC, where appropriate ADB may also support this program through complementary financing of some of its projects. IFC's second programmatic proposal will be targeted at clean energy advancement via private commercial banks. Following further appraisal and discussions with the market, the distribution of IFC's $70 million CTF allocation between RE and energy efficiency programs have been adjusted to better reflect the relative needs in the respective sector in meeting the objectives of the CIP. More specifically this Program seeks to encourage transformation of the private RE sector by establishing a series of direct project level interventions in the solar and wind sectors, both of which are nascent but offer significant potential in Thailand. These initial investments would help to demonstrate that solar and wind projects can be successful in the Thailand context (thereby helping to reduce risk for future investors) while also addressing some of the early entrant barriers related to establishing precedents and reducing costs.

Country Context:

Thailand is one of the foremost development success stories in Asia but its greenhouse gas (GHG) emissions have steadily increased as energy consumption and electricity demand have closely followed economic growth. Final energy consumption and electricity consumption have grown annually over the last 25 years at 6% and 9%, respectively. Per capita electricity consumption grew by almost 25% in just the past five years. The driving forces for greater energy (and carbon) intensity are industrial development and increasing demand for transport fuels.

In 2006, Thailand's energy-related GHG emissions were 272 $MtCO_2e$ GHG, making Thailand the 24th largest emitting nation globally. GHG emissions from fossil fuel sources have been growing at 3% per year since 2004, mostly due to consumption of petroleum products. The largest contributors to GHG emissions are electricity generation (37%), transport (26%), and manufacturing (23%). Thailand's electricity generation is dominated by gas-fired (72%) and coal-fired (20%) power (both fuels are sourced domestically).

Thailand's development policies and strategies have increasingly focused on GHG emissions reductions and improved energy intensity in recent years. The Tenth National Economic and Social Development Plan

(TNESDP) (2007-2011) seeks to cap CO_2 emissions per capita at 3.5 tons/capita/year. The Government of Thailand (GoT) has also recently announced the 15-year Alternative Energy Development Plan (AEDP) which lays out the country's long term vision and strategic direction for reducing dependence on fossil fuels. The AEDP's target is to increase the share of alternative energy from 6.4% in 2008 to 20% in 2022. If the target is achieved, it will help Thailand avoid the addition of 42 $MtCO_2e$ GHG emissions per year.

Major new investment in generating capacity will be needed to satisfy Thailand's continued rapid growth. As of 2008, installed capacity was 29.1GW. The latest Power Development Plan (2008 – 2021) forecasts an annual growth rate in demand of 5 percent over the next decade. To meet this, an additional generation capacity of 30.2GW will be needed by 2021. Despite the government's AEDP, most of the increased power capacity is expected to come from gas-fired (14.9GW) and coal-fired (4GW) generation. In addition to climate change challenges, Thailand also needs to better diversify its energy mix and avoid such heavy reliance on the finite domestic natural gas resources (estimated at 25 years). It will do this by increasing the share of generation from locally sourced coal and lignite, from renewable energy and potentially with its first nuclear power plant. However, most coal reserves in Thailand are lignite with high sulfur content and low calorific value so the use of this resource will exacerbate the climate change mitigation challenges.

Despite a natural endowment of world-class renewable energy resources (solar, wind, biomass and hydro), Thailand's RE sector remains relatively untapped. Reasonable progress has been made in both hydropower (5% of total generation capacity installed) and biomass power (1.7%) but the wind and solar sectors both have less than 10MW of grid-tied capacity installed. Substantial acceleration in investment across all REs and particularly wind and solar will therefore be needed to add the 4GW of new renewable power generation capacity needed to reach the AEDP 2022 target of 5.6GW. The Ministry of Energy (MOEN) estimates the renewable component of the AEDP will require US$10 billion of new investment, or an annual investment of around US$760 million over the next 14 years. This amount of investment is expected to come from both the public sector (government and state owned enterprises) and the private sector, though the private sector is expected to provide the bulk with more than 80% of the total investment.

Private sector participation in power generation is well established in Thailand via the Independent Power Producer (IPP) program for facilities of more than 90MW, the Small Power Producer (SPP) program for facilities of more than 10MW and the Very Small Power Producer (VSPP) program for facilities of less than 10MW. The SPP and VSPP programs streamline investment with standardized power purchase agreements (PPA) to the state-owned utilities.

Thailand has begun to recover from the combination of economic crisis, weakening domestic demand and instability that has affected the Thai economy since 2007. Risks to the near-term outlook for Thailand are still significant, due to the elevated recent political uncertainty related to the ongoing demonstrations by the main opposition party which turned violent in April and at the time of writing protestors continue to call for the dissolution of parliament and the resignation of the prime minister. In response to the crisis and the protracted political tensions which have had a dampening effect on private investment, the World Bank and IFC have decided to reengage more actively, including with selective financial support such as through this Program. The Program will benefit from being invested on a project by project basis alongside IFC loans and IFC will review the political situation carefully prior to making any project level commitments.

Barriers to Private Sector Investment

In 2006, the GoT created incentives for private sector investment in RE, setting a supplementary feed-in tariff or "adder" for each RE technology and creating SPP and VSPP PPA's for intermittent RE power sources. These programs support renewable electricity production from biogas, biomass, municipal solid waste (MSW), wind, solar, and other renewable energy sources. The size and term of the adder varies by technology. To

date, the defined adders have been able to initiate private sector investments in biomass, hydro and MSW. However, investments in solar and wind power have failed to take-off. This is due to the lack of experience in these sectors in Thailand and because the adder tariff, though significant, is only for 10 years and provides insufficient marginal project returns for the risk assumed in these early wind and solar investments.

Program Summary:

The Program represents an IFC initiative to accelerate private sector participation in RE, in particular in the more challenging solar and wind sectors in Thailand. These two sectors have higher capital costs and the adder is insufficient to encourage private sector investment. This is particularly the case given the lack of experience in these sectors in Thailand which increases the perceived risks and adds to the high initial development costs experienced by pioneer projects. The Program aims to target and apply CTF funds to support private sector solar and wind projects and will address existing market barriers through advisory services to catalyze accelerated growth of these markets and ultimately transform the RE sector in Thailand. The Program will seek to retain flexibility (in terms of approach, project selection, and application of CTF funds) in structuring the best way to accelerate the implementation of these RE investments with minimum concessionality on a project-by-project basis. Although it is expected that senior debt would be the instrument most likely to be used, IFC would retain the flexibility to use other products such as subordinated loans, mezzanine or equity, depending upon the structure of each project. The products will be chosen based on what can most effectively address the barriers to accelerate investment and most efficiently use CTF funds to leverage private sector capital.

The Program will focus on solar and wind technologies, each of which has significant potential for gigawatt scale in Thailand. Transformation of these sectors therefore has the potential to have a material impact on the GHG emission intensity of Thailand's power sector. In each case, by supporting the rapid development and construction of some early pioneer solar and wind projects, the Program will have a substantial demonstrational and transformative role. Solar power is currently an expensive alternative but represents the future given the rapid cost reductions in the sector and the potential for scale with Thailand's huge solar resource. Wind power offers the potential for rapid generation capacity expansion once the initial projects succeed.

IFC has been actively engaging with private sector project developers in the solar and wind sectors to get a detailed sense of the most advanced and suitable projects to merit CTF support. IFC has an active pipeline of transactions that are potential recipients of CTF funding, making this an urgent program for support. Specific projects are not mentioned in this programmatic proposal given issues of confidentiality and to preserve flexibility in IFC's discussions. The projects supported by the Program are expected to fall within the following sectors:

- *Solar sector.* Thailand has an excellent solar resource with average irradiation rates around 5kWh/m2/day making it an ideal location for deployment of photovoltaic (PV) energy. The country has had good experience with micro-scale PV solar home systems but the development of the grid-tied, megawatt scale solar sector is still in an early stage of development in Thailand. According to MOEN, only 0.064 percent of total solar potential has been developed, just 32MW (of which less than 10MW is grid-tied) out of a potential 50GW. With the GoT's new incentives, solar energy receives an adder tariff of 8 baht/kWh on top of the base tariff for the first ten years of operation. In the long-term, with increased experience and capacity in Thailand and the ever decreasing capital costs for solar PV modules, this regulatory support is expected to be enough to support the sector sustainably. But in the short-term, with limited experience of

grid-tied solar in Thailand and higher perceived risks of this technology, the adder only provides marginal or insufficient returns given today's capital costs of solar PV. Concessional funding is necessary to support the pioneer projects and to accelerate the sector's growth to a critical, sustainable scale. Solar projects supported might be single SPPs or a collection of VSPPs. The demonstration effect of such projects will be high, representing a first step in application of a solar technology that holds huge promise in Thailand. CTF funding is most likely to be applied as low cost, long tenor senior loans alongside IFC to catalyze commercial bank debt and to enable such projects to proceed. Although the majority of project financing will be limited to the period of the 10-year adder, a smaller tranche of IFC and CTF debt may be extended out longer for repayment by the standard power tariff. Given the high-costs of solar power, relatively large amounts of CTF funding (up to 25% of project cost) may be necessary to enable the first projects, though the projects may not be of large size.

- *Wind sector.* Thailand has a number of regions with reasonable wind conditions. Thailand has class 3 wind areas along the southern coastline and the northern part of the country. Average wind speeds of around 6.4 m/sec in these areas suggest a total estimated potential of 1.6GW, but as of now only 1 MW has been developed and this is owned by the public sector. Several proposals to develop wind have been submitted to the MOEN which has set a target to develop 800 MW of wind capacity by 2022. With the GoT's new incentives, wind energy receives an adder tariff of 3.5baht/kWh on top of the base tariff for the first 10 years of operation. As with solar PV, it is thought that in the long-term, with increased experience and capacity in Thailand and the ever decreasing capital costs for wind turbines, this regulatory support should be enough to support the sector sustainably. In the short-term, however, with almost no experience of large-scale wind power in Thailand and the adder only providing marginal or insufficient returns given today's capital costs of turbines and the perceived risks of this "new" technology, concessional funding is necessary to support the pioneer projects and to accelerate the sector's growth to scale. CTF funding is most likely to be applied as low cost, long tenor senior loans alongside IFC to catalyze commercial bank debt and to enable such projects to proceed but could also be applied as mezzanine financing to enable improved leverage given that this can be a challenge with wind projects given the uncertainties of energy yield estimation.

Terms of CTF Funds:

Note that final agreement to provide CTF funding to any project would be subject to a full due diligence and approval by an internal IFC Approval body as well as IFC's Board, per the CTF private sector guidelines. The terms of each individual CTF transaction will be reviewed and approved by an Investment Review Committee which is independent from and different to the Investment Review Committee that approves the terms of the IFC investment.

Advisory Services:

IFC has learned from experience that targeted advisory support can further accelerate the development of a country's renewable energy sector by creating an enabling environment for future / parallel investments; however, the interventions needed to maximize impact are not always evident at the inception of a program, or they change during a program's implementation. To address this challenge but ensure that the market has the adequate support necessary to catalyze growth, IFC will develop an advisory services program that includes some basic work, while maintaining flexibility in other areas. IFC would report to the Trust Fund Committee during its annual reporting on the ultimate design of the advisory services component as it progresses. The basic advisory services component will include at a minimum knowledge sharing activities that ensure the learning and information generated though these initial projects is shared with future developers, financiers and

government bodies but is also expected to include some of the additional (or new) activities outlined below:

Knowledge Management activities:

(i) Disseminating lessons learned and non-confidential information obtained from early projects to regulators, project developers, and the wider stakeholder group can be an effective way to promote a better regulatory/market environment and reduce perceived risks for future project developers and private financiers. By supporting "neutral" associations (eg. wind or solar associations) to gather, aggregate and share real time information on the sector, stakeholders are likely to get "comfortable" with investing in the sector at a faster rate. Transparency, monitoring and evaluation, and knowledge management are all key elements of the CTF supported projects and a knowledge management program would be developed to ensure an effective feedback loop is created to capture and share information while managing and balancing the confidentiality requirements of the projects and developers in question.

(ii) The electricity produced by solar and wind technologies is intermittent and it would be valuable to prepare a white paper for the sector stakeholders exploring this issue and its effect on the Thai grid. This would allow them to better understand the effect of solar and wind on the grid and optimize their contribution to Thailand's energy mix. Such work would include studying the optimization of solar and wind power in the grid and analyzing the maximum capacity that the grid can handle. Such analysis could also study the impact of multiple solar and wind farms on the stability of the grid.

(iii) Developing knowledge and experience in the Thai market for accessing carbon credit opportunities. To date, Thailand has not been able to access the carbon market at scale. The individual private sector solar and wind power projects supported by CTF funds are expected to access the CDM carbon market, thereby having a demonstration effect for future renewable energy projects. Dissemination of best practice in this area could support expansion of all RE technologies.

Capacity Building:

Experience and information on RE among project developers, consultants, engineering firms, investors, lenders and regulators in the region is limited, particularly with regards to solar and wind. To foster successful solar and wind sectors in Thailand, there needs to be adequate local capacity/knowledge among all the relevant shareholders. This local capacity will ensure successful sector growth, avoid costly mistakes and significantly reduce project construction costs making solar and wind projects more competitive. The capacity building component would enhance local institutional capacity in the sectors by:

a) Building local capacity of Project Development, Manufacturing, EPC and O&M contractors and developing tools to support market development, thus reducing upfront costs and risks for future developers and investors (workshops and expert training)
b) Conducting assessment and mitigation of key risks and solar and wind resource studies (identification of hot spots)
c) Developing tools to support market transformation through standardization and quality assurance
d) Supporting project design, procurement, construction – including contract and legal support to solar and wind developers
e) Supporting developers in establishing appropriate environmental and social standards assessments and action plans and assessing and addressing the cumulative impacts of broader sectoral growth.

A combination of the above-mentioned possible instruments could facilitate the initial and future projects, help address the 'nascent technology' and 'market-based' issues and pave the way for accelerated growth of sustainable energy in the region.

Describe the Proposal's strategy for achieving market transformation:

The Program will provide a transformational role in the Thai power sector both by supporting early private sector participation in supporting some of the first megawatt scale projects in two low-carbon technologies that offer the potential to contribute in gigawatt scale to the country's energy mix. The demonstration effect of the proposed projects included under this Program will include: i) demonstration for private sector participation in solar and wind RE. This will lead the way for developers, investors and lenders to follow with scaled up investment; ii) demonstration of initial private sector megawatt scale projects in two technology areas which will improve capacity in the sectors providing these technologies (equipment supply, engineering, advisors etc.) and prove the technical and economic realities of these technologies in the Thai context. CTF funding will be used to provide pioneer projects with returns commensurate to the risks taken which will provide incentive for future investments in additional solar and wind projects and accelerate growth of these sectors.

In addition to the direct impact of the projects that the Program will support, a parallel advisory engagement is also envisaged which will support knowledge transfer from these initial projects and also be applied to any professional services which can benefit the common good of future market entrants (eg legal advice on negotiation of initial model contracts).

IFC will leverage its deep, international experience in solar and wind power to support developers in these first of kind projects. IFC has financed hundreds of megawatts of wind over the last two years in a range of geographies and under a range of regulatory environments. IFC has also financed several first of kind projects in the solar sector including the first megawatt scale PV installation in an emerging market. IFC will apply innovative structuring to apply CTF funds with minimum concessionality to address the key barriers that are preventing progress of private sector investment in solar and wind sectors.

FIT WITH INVESTMENT CRITERIA

Potential GHG Emissions Savings

Depending on the final allocation of funds between solar and wind technologies the Program is expected to directly support emissions reductions of 2,587,000 tons CO_2e. Assuming a 10x multiple in terms of indirect, demonstration impact, the Program is expected have an impact of 1GW resulting in reductions of 25,870,000 tons CO_2e.

Solar PV and wind power are fully proven, both technically and commercially, and there are widespread examples of successful application at scale around the world. Thailand has an excellent solar resource that promises the greatest future potential opportunity for renewable energy in the country and some good areas of wind resource offering gigawatt scale development. Once these initial projects are implemented and provide a successful demonstration/track record, it is very feasible that the market will achieve the level of scale anticipated in this example.

Cost-Effectiveness

Based on the above calculations and an expected Program cost of US$40 million the implied direct GHG reductions per CTF dollar spent will be 0.06 tons CO_2e/$ during the life of the technology and the implied indirect GHG reductions per CTF dollar spent will be 0.60 tons CO_2e/$ during the life of the technology. Technology for both the solar and wind sectors should continue to evolve leading to improved equipment pricing and lower project costs. Future projects will benefit from the learning curve that the pioneer projects

have undergone.

Demonstration Potential at Scale

The Program seeks to support and enable the early megawatt scale private-sector solar and wind projects in Thailand. Solar and wind projects are higher cost energy solutions and relatively larger amounts of CTF support will be necessary to enable such projects. Both technologies have the potential to provide power in the gigawatt scale in Thailand so the initial projects supported by the Program will provide a demonstration effect and could provide the impetus for a tenfold increase in projects. As shown in the calculations above, this could provide GHG emissions reductions of 26 $MtCO_2e$ against a current energy sector annual production of 272 $MtCO_2e$.

The Program is expected to result in a transformed solar and wind RE sector that will view projects in these sectors as standard business practice. In the long term, CTF will not be needed and the sector will be sustainable because: (i) the reduced perception of risk will lower the cost of capital enabling future projects to achieve reasonable returns; and (ii) as the global markets reach scale, equipment costs for solar PV and wind turbines will continue to fall, allowing the domestic regulatory support from the adders to be sufficient to support future growth of the sectors. Long-term, with further technological advances and sector scale, it is expected that wind and solar can offer power at costs that are competitive with thermal technologies.

Development Impact / Co-benefits

The expected co-benefits achieved by the Program include:

- By enabling and accelerating private sector participation in solar and wind renewable power generation in Thailand, the Program will directly support the diversification of the country's power generation mix which is currently highly dependent on domestically sourced gas and coal-fired power of which there are finite supplies.
- By accelerating the development of the solar and wind renewable energy sector and supporting its achievement of critical scale in Thailand, the Program will open up opportunities for potential future renewable energy equipment manufacture in Thailand.
- By accelerating the development of these sectors in Thailand, it is expected that development in neighbouring countries in the Mekong delta and broader South East Asia will also be supported.

Implementation Potential

See description above regarding Thailand's solar and wind markets for details on the market context and regulatory environment. This project, along with other World Bank CTF related interventions is expected to help the GoT implement AEDP.

In all cases, projects supported under the Program will seek to minimize the use of CTF funds and maximise the leverage achieved from MDBs, private sector, and carbon finance sources. The Asian Development Bank is also active in Thailand and where opportunities exist IFC will seek to co-finance projects with the ADB. For example, ADB and IFC are both exploring financing one of the solar projects being considered for this program.

The initial US$40m allocation requested herein could be quickly utilized. If this occurs and funds are available, IFC may revert to the CTF Trust Fund Committee seeking a streamlined approval for reallocation of

funds approved under the CIP to support expansion of this program (with support from the MDB to which the funds were originally allocated).

Additional Costs & Risk Premium:

- CTF financing will complement the regulated "adder" that has been created by the GoT to support RE projects and Clean Development Mechanism revenues via the Kyoto Protocol created under the United Nations Framework Convention on Climate Change.
- Given the limited experience of grid-tied wind and solar power in Thailand and higher perceived risks of this technology, the adder only provides marginal or insufficient returns given today's capital costs of wind and solar PV. Concessional funding is necessary to support the pioneer projects and to accelerate the sectors' growth to a critical, sustainable scale. CTF funding is most likely to be applied as low cost, long tenor, senior loans alongside IFC to catalyze commercial bank debt and to enable such projects to proceed.

Financial Sustainability

The recently created adders for the various RE technologies in Thailand have enabled sectors such as biomass and hydro to develop without concessionary finance. For solar and wind technologies, the adder has made the sectors more attractive, but they still require additional support to initiate the first few projects due to high equipment costs and high perceived risk. The projects within the Program are expected to promote sustainability by helping to establish a demonstrated track record for the technical and financial viability of private sector renewable energy projects, and thereby assisting to accelerate the development of the sector. Future project developers are expected to benefit from the development efforts, persistence and high costs encountered by the early movers in the sector, including the projects within the Program, which should ease the development and implementation process and lower the entry costs for future project developers. The lowering of risks, which results from the establishment of such a track record, along with improvements in the financial markets and ongoing lowering of equipment costs, will make Thailand's renewable energy projects attractive on their own merits in the future. By providing a demonstration to developers of how such investments can be made, the Program will enable an accelerated scale-up of these sectors which will become economically sustainable over the coming years as the cost of capital and the equipment prices decrease.

Effective Utilization of Concessional Finance

Solar photovoltaics show great promise for long-term cost reduction and competitive provision of low carbon power, but for now are relatively high cost forms of generation. Wind power is commercially proven worldwide but apart from in locations with particularly good wind resources, it cannot compete with the lowest cost forms of thermal power generation. The pioneer MW-scale projects in solar and wind will face higher costs and higher risks associated with first movers and the concessionary financing will be used to address these issues. In the long-term however, it is believed that the lower cost of capital from lower perceived risk once the initial projects have been completed and the lowering equipment costs will be sufficient to enable sustainable growth of the wind and solar sectors.

Given the varying economics of the technologies considered under this programmatic proposal and the site specific economics of renewable power in general, the structuring of CTF funds will need to be tailored on a project by project basis but will always seek to maximize the use of other sources of funding (MDB, private sector, carbon finance and other concessionary sources) while minimizing the use of and concessionary nature of CTF funds. The financial markets in Thailand are relatively liquid and mature so that interest rates are generally competitive and low. In order to provide a material concession and to tangibly improve returns so

that they are attractive to early market entrants, CTF loans will need to be priced at low rates.

Other concessional financing has not been used so far and is not expected to be used in similar projects in the near future in Thailand. Currently, the GoT has implemented initiatives to encourage renewable energy projects (the adder, as well as certain tax incentives), but while these initiatives have generated interest in the sector, they have not resulted in completed projects at this time. One 6MW solar project, which is currently under construction, has benefited from support from a GoT equity investment fund .

Mitigation of Market Distortions

The Program is designed specifically to have a supporting rather than distorting impact on the nascent private Thai solar and wind power sectors. The proposed Program will provide CTF funds to individual projects and will enhance an already supportive domestic regulation that encourages renewable energy, until the sectors have reached sufficient scale to grow sustainably. It is unlikely that these pioneer projects would move forward without the concessional financing. If they did the poor returns received would provide little incentive for replication and growth of the market to scale.

Risks

Risks associated with the Program include:

- *Risk:* The current political tensions in Thailand will have unpredictable impacts on the Thai economy. While political violence has been contained to specific sections of the capital, an escalation of violence, a deepening of the political crisis, or a broadening of the geographical impact will inevitably slow economic growth and therefore reduce growth in demand for electricity and impact the Program. A change in government may also impact policies governing the electricity sector.
  Mitigant: Historically, despite previous political changes, Thailand has had a consistent track record of pro private sector regulation. Program funds will be invested alongside IFC financing and IFC will review the political situation carefully prior to making any project level commitments.
- *Risk:* First megawatt scale private projects of solar and wind power in Thailand will face risks associated with lack of experience and capacity in the sector.
  Mitigant: The Program will benefit from IFC's selection of projects with the right combination of sponsors, suppliers and off-takers to maximize the chances of success. The Program will also benefit from IFC's global experience of financing private sector RE projects.
- *Risk*: In selecting projects to benefit from the Program, IFC will consider a number of risks that are typical of similar transactions, including tariff and market considerations, completion risk, and technology concerns.
  Mitigant: Residual risks stemming from the inherent uncertainty of solar and wind renewable energy resources, possible cost overruns and other factors may also be addressed through financial structuring measures such as the establishment of minimum financial ratios or reserve accounts.
- *Risk*: Given that both wind and solar are relatively costly sources of energy and the regulated adders are relatively high versus other technologies, there is a risk that excess growth of these sectors could ultimately prove too expensive for the Thai power sector.
  Mitigant: The Thai regulators are aware of this risk and have observed this outcome in Spain and other countries. They are therefore managing the number of licenses provided for these technologies.