

The policy and regulatory aspects of a bankable renewable power project

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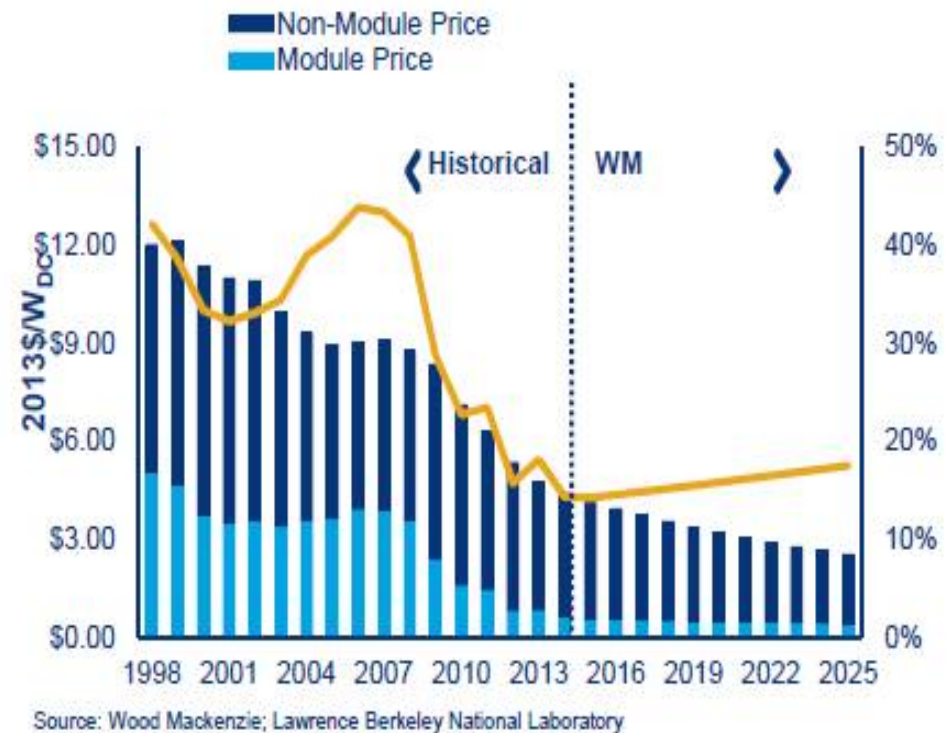
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Contents

1. Introduction – reduced costs, the restriction of subsidies, policy priorities and political ambition.
2. The feed-in tariff and the ingredients of a bankable offtake agreement.
3. The feed-in tariff compared with investment based subsidies.
4. The intermittency of renewable power.
5. Delivering renewable energy's potential – energy storage and the transformation of power systems.

The speed of the solar cost decline

- Since the late 2000s and early 2010s module costs have driven a rapid decline in solar costs substantially faster than anticipated
- Today PV costs are below the levels projected for 2030 at the time the European Commission presented its 2nd Strategic Energy Review in 2008.
- The capabilities of suppliers of PV manufacturing equipment to incorporate new PV technologies in production and assembly lines, combined with a worldwide appetite of governments to build domestic PV manufacturing capabilities, have contributed to PV manufacturing growth, innovation and costs declines.
- With continued decline, module costs have gone from comprising nearly 40% of installed price to just under 20%.



The contradictions of evolving regulation

- In many jurisdictions the necessity of providing incentives for solar power generation is being questioned.
- The capabilities of suppliers of PV manufacturing equipment to incorporate new PV technologies in production and assembly lines, combined with a worldwide appetite of governments to build domestic PV manufacturing capabilities, have contributed to PV manufacturing growth, innovation and costs declines.
- Such incentives remain critical, however, as although solar costs have declined dramatically over the past ten years the cost to generate electricity with large - scale solar remains well above local power prices and other fuel sources for power generation in most markets.
- Their continued provision therefore is very much a question of both policy priorities within a particular country, and its ambition to minimise carbon emissions.

Policy priorities and political ambition

- With regards to policy priorities in both developed and developing countries budgetary constraints have impacted on the development of policy, the level of support offered to renewable energy, and the willingness of governments to cross – subsidise varying between jurisdictions and over time.
- As examples from within the region:
 - In Kazakhstan the Ministry of Energy has been concerned that the increased deployment and subsidisation of renewable power generation will result in price inflation, power currently produced at low cost by depreciated coal – fired stations (the reason for its opposition to the indexation of the feed – in tariff to the foreign exchange rate).
 - In Ukraine the very existence of a low cost power supply, from nuclear power stations, has justified the promotion of what are comparatively high feed – in tariffs. Discussion, however, has already been initiated with regards to how such subsidies may be maintained and renewable goals met in the context of a growing need to replace existing base-load power generation.
- In terms of political ambition the recently proposed amendments to the EU's Renewable Energy Directive (2009/28/EC) illustrates not only the continued importance of incentives in providing certainty and predictability to investors, but the need to promote the potential of renewable energy across sectors, and to set a binding EU level target on the share of energy from renewable sources.

The feed-in tariff and the key ingredients of a bankable offtake arrangement

- Many countries have supported solar generation via feed-in tariffs, which entitle favoured generators to be compensated by an electricity supplier, government counterparty or other regulated entity, for electricity delivered to the grid at a predetermined, above market rate, for a fixed period of time.
- As will be seen sequencing is critical to a project's ability to access financing: the technical and financial conditions for grid connection, and the feed – in tariff to be paid under the PPA, need to be confirmed before construction financing is issued.

The feed-in tariff and the key ingredients of a bankable offtake arrangement

Credit risk

- The provision of such a feed-in tariff involves the conclusion by the power generator of a long-term power purchase agreement (PPA) with an offtaker with an adequate credit rating before the commencement of construction (and subject to an ongoing credit rating test).
- Project sponsors and financiers will typically require a guarantee or other type of credit enhancement dependent on the credit grade of the offtaker and their perception of project risk in general (more often than not a PPA is only viewed as being bankable if the payment of the feed-in tariff is treasury guaranteed).
- Many commercial banks require political risk insurance before financing, which may be provided by MIGA, development banks, or export credit agencies.

The feed-in tariff and the key ingredients of a bankable offtake arrangement (cont.)

Currency risk

- Access to financing significantly improves if the feed-in tariff offered is in hard currency. If the feed-in tariff is to be paid in the local currency the sponsor will have to hedge the currency risk through swap or future agreements, the cost of which can reduce a project IRR significantly.
- The contrasting experiences of the ability to raise financing in a country in which the feed-in tariff is denominated in local currency, and a country in which the feed in tariff is denominated in EUR, illustrates that the currency risk associated with devaluation will restrict access to financing.
- Where local currency is used governments have struggled to mitigate such perceived currency risk, the indexation of feed-in tariff payments to both inflation and exchange rate fluctuations complicated and controversial.

The feed-in tariff and the key ingredients of a bankable offtake arrangement (cont.)

Grid connection

- A bankable offtake arrangement has a number of other ingredients:
 - the issuance of binding technical conditions for grid connection before the commencement of construction;
 - non – prohibitive grid connection costs;
 - a clear procedure for land allocation (with security of tenure for the lifetime of the project and the necessary rights to export the electricity to the grid);
 - land use rights, along with clear definition ownership rights for the connection line; and,
 - a clear procedure for the energisation / final acceptance of the project.

The feed-in tariff and the key ingredients of a bankable offtake arrangement (cont.)

Local content and the allocation of responsibility

- Any local content requirements, and when such requirements are confirmed, need to be clear, i.e. their satisfaction is on the basis of the value of equipment imported, money spent, or value added.
- When an auction system is not used the competent Ministry / Agency should be made responsible for:
 - the development and approval of a comprehensive allocation plan for renewable facilities; and,
 - the development of a clear procedure for the inclusion of a project into the list of renewable facilities eligible to conclude a PPA.

The use of an auction process

- In many countries an auction process for PPAs is utilised to ensure competitive pressure on pricing, and credit support requirements (either the PPA itself may be the subject of the auction, or the project in its entirety, i.e. the PPA, a prepared site, and the grid connection).
- If implemented effectively such a process will allow an operator to present a realistic project cost and secure a reasonable rate of return, with an incentive to improve that rate of return during project execution.
- The value of an auction process, however, may be distorted by the participation of a state – owned utility company: an auction process only works if there is competitive tension and a price cap.
- Furthermore, foreign investors tend to favour negotiated deals since auctions tend to create a price floor which either distorts competition or results in the tabling of non-commercial bids (cf. auctions for capacity which tend to create a price ceiling).

The use of an auction process (cont.)

- In countries in which auctions have been utilised effectively the price tendered has typically decreased as the transmission, distribution and other infrastructure in a country is developed, the PPAs offered are increasingly viewed as being bankable, and contractors and sub – contractors are prepared to offer lower premiums / prices as their perceived level of project and country risk reduces.
- Auctions significantly decrease the interest of financial investors as their assumption is that there will be a limited return on equity, i.e. a successful bid will be made on a cost plus basis as opposed to a price that takes into account the future cash generation capacity of a project.

The pros and cons of a feed-in tariff

A fixed output price as incentivising efficiency

- One of the important and desirable properties of a feed – in tariff is that it preserves strong incentives for both investment efficiency and operating efficiency. With the price of output fixed every dollar of investment cost reduction translates into a dollar of profit, and every additional kWh produced adds to profit.
- From an investors' perspective, fixing the output price removes all risk associated with the supply and demand of electricity. The level of spending, however, understates the true subsidy involved as shifting risk from renewable generators to other market participants constitutes a subsidy.

The failure of production to respond to the wholesale price

- Feed – in tariff schemes generally guarantee the same revenue per kWh regardless of when that power is generated. The wholesale spot price of electricity often varies dramatically depending on weather, time of day, and other factors. Feed – in tariffs that do not vary with the wholesale price therefore reduce the subsidy when electricity is most valuable, thus distorting incentives regarding the timing of production.

The pros and cons of a feed-in tariff (cont.)

- **A comparison with investment based subsidies**
 - On balance output subsidies and feed – in tariffs are superior to subsidising investment via the tax system.
 - Using tax credits rather than direct expenditures reduces transparency, incurs hidden costs, and reduces generation per unit of public expenditure.
 - Subsidies for solar should reward generation, not investment, and should be structured to reward generation when it is more valuable.

The intermittency of renewable power

- The increased role of renewable generated power, and its intermittent nature, will add to the challenge of managing peak energy demand, a task that is going to become increasingly complicated due to further electrification of our energy usage, i.e. automobiles and heating.
- Power generation will be less able to respond to demand changes if the proportion of renewable generated power increases as expected, thus increasing the need for flexibility.
- With regards to the setting of incentives, since the costs of renewable energy are uncertain, change over time, and vary from project to project, the quantitative response to any particular tariff level is uncertain.
- In recent years, regulatory regimes have limited the excessive response by either limiting total spending in any year or by reducing the tariff automatically when quantity milestones are passed.

Moving forwards: delivering renewable energy's potential

- Global efforts to decarbonise, including raising generation capacity, will increasingly rely on the development of technology to help make the supply and use of energy more reliable, cost – efficient and flexible.
- In particular, there will be a growing emphasis on demand side flexibility which uses technology and data to manage consumer demand, e.g. smart grids which incorporate this technology and data to manage supply and demand on a larger scale across a whole grid network.
- The utilisation of such technology would allow for the connection of greater levels of renewable resources to the network, and the better control of demand and real – time pricing at both the wholesale and retail level.
- Consumers would be better able to increase, decrease or shift their energy use in response to signals, their decisions helping balance the power system and leading to an improvement in energy efficiency.

The role of energy storage in the transformation of power systems

- Increasingly centralised grids are being complemented by distributed energy networks or micro grids where smaller renewable sources produce energy for consumption at nearby locations.
- At this more local level energy storage plays a key role as it helps to ensure that energy is available when and where it is needed and is not wasted.
- The IEA has estimated that 150 GW of battery storage and 325 GW of pumped hydropower will be needed if it is to meet its 2030 target for 45% of power generation to come from renewable sources.

The use of storage through the energy supply chain

Power Generation / Supply

- Storage systems can assist in overcoming the problems associated with the intermittency of much renewable energy generation and thereby facilitating an increase in the amount of renewable energy in the power system, and reducing the need for high levels of back-up thermal generation capacity.
- It can also be used to improve the prices available for sale of energy by allowing supply at higher – priced peak periods and has the potential to enable renewable generations to participate in capacity and system balancing sales.

Consumers / Demand

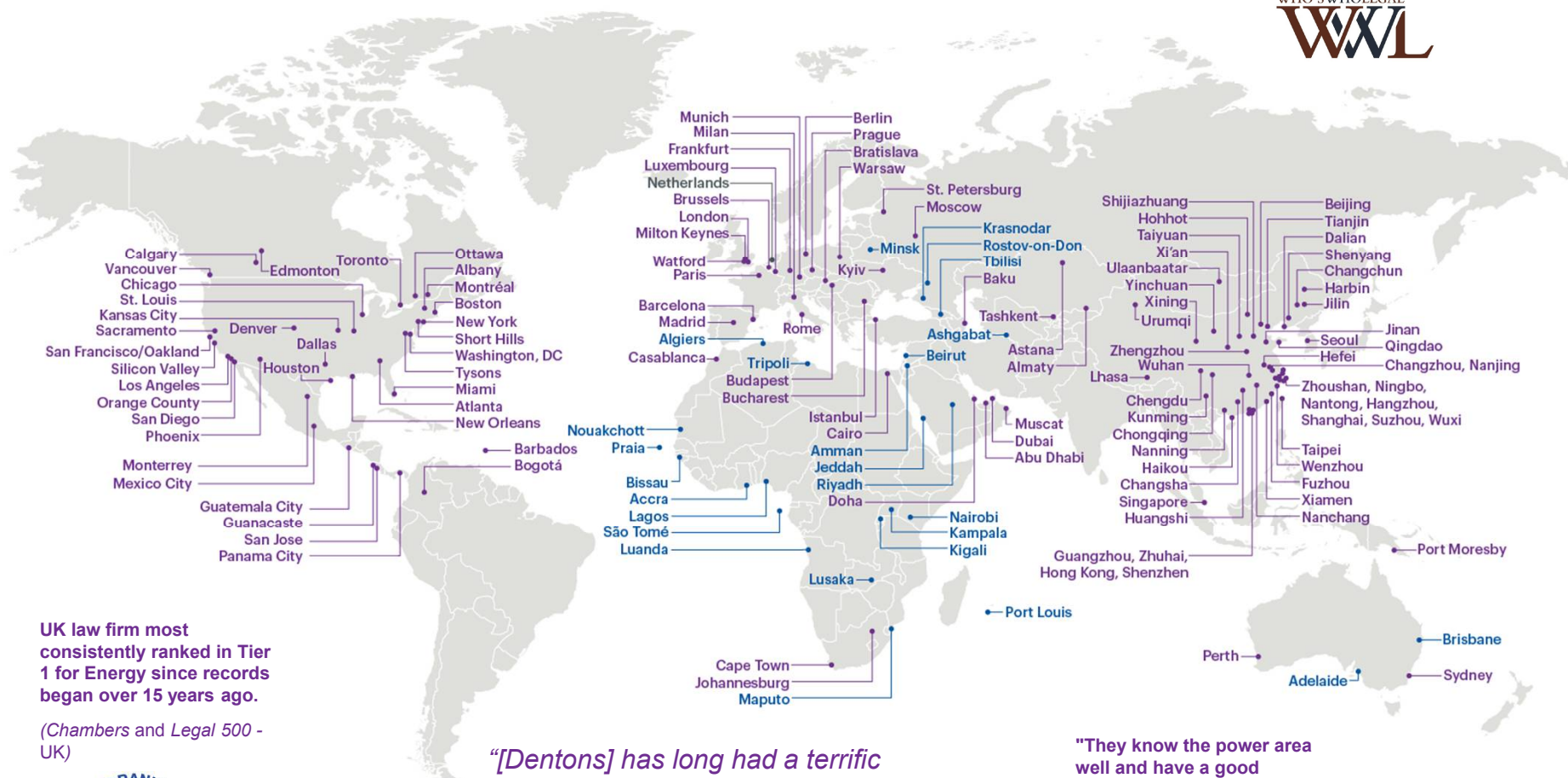
- Rather than exporting surplus power back to the network for a nominal financial benefit energy storage systems allow end users who also generate power to store the energy and reduce their need to import higher priced electricity from the network.
- This can also assist in balancing the overall supply and demand equation.

Using information to increase co-ordination

- Whereas currently energy systems are dominated by large power generators, in the future we can expect to see energy flowing from smaller generators, such as solar and wind, to storage and from storage back to the grid.
- To facilitate this distribution systems will need to be more actively managed, their activity more closely co-ordinated with that of transmission systems.
- Distribution system operators will need to have a much greater role forecasting that they currently do, and need to monitor the increased amount of data on the network.
- Such active management can help to balance the national system as weather systems differ across a country affecting both the consumption of electricity, e.g. different heating requirements, and the production of electricity, e.g. increased solar production from sunny states.

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Louis Skyner, an English qualified solicitor, headed the Russia & CIS oil & gas practice of a large international law firm from July 2013 to April 2017. He joined Dentons as Partner on 1 May 2017.

His practice has primarily been based on advising international oil & gas companies on their participation in upstream and downstream projects in Russia & the CIS, Russian oil companies on their activity outside Russia, and joint ventures / operators on a variety of regulatory and contractual issues. This work has involved the structuring and financing of projects being developed under concession, production sharing, and risk service agreements, and the structuring of the sales arrangements used by them.

In addition, over the past couple of years, he has advised the project sponsors of a number of renewable power generation projects in the CIS on their structuring and financing.

Prior to July 2013 Louis worked as leading legal counsel at Statoil, based in Oslo, Dubai and then from 2010 in Moscow. In this position he supported Statoil's participation in oil, gas and LNG projects in both Russia and the Middle East.

Aside from his legal practice Louis has authored numerous articles on Eurasian energy market regulation, economics and politics, from 2005 to 2011 as an associate fellow at Chatham House in London, from 2012 to 2014 as adjunct professor of the New Economic School in Moscow, from 2015 to 2016 as associate professor of the European University in St Petersburg, and from 2016 as an associate fellow of the Forum for Central Asian Studies at the University of Cambridge. Louis was awarded a doctorate by the University of Cambridge in 2002.