PwC roundtable discussion paper
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Gain not pain
Managing risk in utilities capital projects

Capital projects & infrastructure challenges in the power utilities sector

The roundtable

Around 50 senior executives and experts from ten different countries gathered in March 2011 in Dusseldorf, Germany for PwC's roundtable on the capital project and infrastructure challenges facing utility companies. Participants were drawn from a range of different sectors – utilities companies themselves, financiers and bankers, the legal profession, engineering and technology companies, as well as from PwC. The moderators and speakers were:

Hansjörg Arnold	*Partner, PwC Germany*
Michael Becker	*CFO Siemens Fossil Power Generation Division*
Roman Boguhn	*Head of Energy & Utilities, DCM Loans, Strategic Asset Finance, Commerzbank*
Martin Bork	*Partner, PwC Germany*
Winfried Bröring	*FD, RWE Technology*
Torsten Flosbach	*EKW Project Leader, E.ON Kraftwerke GmbH*
Dr. Jürgen Franke	*Co-Head Energy EMEA, WestLB AG*
Rainer Kiechl	*CFO Hitachi Power Europe*
Anthony Lavers	*Barrister, Counsel, Construction and Engineering Practice, White & Case LLP*
Anthony Morgan	*Partner, PwC UK*
Dr. Norbert Schwieters	*Partner, PwC Germany*
Manfred Wiegand	*PwC Global Utilities Leader*

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Introduction

The scale and complexities of the challenge facing the power utilities sector are immense. The International Energy Agency estimates that the cumulative global investment required in the power sector from 2010 to 2035 is US$16.6trillion (in year-2009 dollars)[1].

[1] World Energy Outlook

The suddenness of the recent economic crisis and the subsequent uncertain recovery shows how stop/start uncertainties can affect project pipelines. As well as economic and market volatility, companies also have to weigh up the direction of travel of the regulatory environment, particularly with respect to the fuel mix. As events following the Japan earthquake showed, this context can change abruptly.

Introducing the roundtable event, PwC's global utilities leader Manfred Wiegand highlighted the changing context of utility sector capital projects. "It's very different from earlier periods of capital project expansion in the sector," observed Wiegand. "Companies themselves have changed dramatically. Their market context is very different. Their geographical spread is much greater. Globally, more capital projects are located away from OECD countries. And there is the rate of technological change. When you come to plan a project, for example, you have to allow for the way in which technology and software will have moved on by the time the project is completed."

"we're managing the biggest capex programme that we've ever undertaken"

"utility companies are having to rebuild know-how and resources"

This report gives a flavour of the content from what was a very wide-ranging roundtable discussion. We focus our summary on:

- *people*
- *financing*
- *contracts and delivery*
- *dispute avoidance and resolution*

and round up the report with a review of the important points that came out of the discussion.

"It's all about people"

Think capital projects and hard images come to mind – hard hats, tough engineering challenges, huge construction sites. But when it comes to capital project success, it was the 'soft issues', arising from people management and human interaction, that many of the roundtable participants emphasised most.

Anthony Morgan, who heads PwC's capital project services, observed: "People make every project unique. The risks might be similar to another power plant that you are building but the project will be unique because the people building it and the team that you've put together will always be different. If you are a corporate you might be very lucky and actually have the same project management team directing and leading the project, but your supply chain is likely to have a different mix of people in it, so every single project is bespoke."

The people aspect of projects was a theme that kept reoccurring throughout the day. Michael Becker, CFO of Siemens' Fossil Power Generation Division, stressed: "Just applying rules and tools doesn't help you if the attitude is not correct. One area where you can see that clearly is in health and safety. You can be very strict and adhere to certain rules but, if your people don't live it in their hearts, then you're not going to be successful."

Becker's point was taken up by Rainer Kiechl, CFO Hitachi Power Europe: "Project management is about tools, structures and standards but these are just one part of the story. They do not replace human interaction." Kiechl also emphasises knowledge transfer at the end of projects: "Learning from things that worked well or that went wrong in the past and passing that on for the next project is well worth paying a lot of attention to."

Torsten Flosbach, E.On project leader for a major new CCGT power plant at MalÏenice in the western part of Slovakia, observed that people issues are all the greater because of the wider range of professions involved on a project: "It's important to have a multi-disciplinary approach with, for example, commercial people working alongside technically skilled experts. But this also means you need to define a common language. Having a common language to communicate the risks properly is one of the main tasks to solve in project risk management."

"There are lots of books on project management. The science of project management is well known. But the way in which it's delivered, the people and the cultural aspects, are what gives us the challenge".

Physical distances can stretch this challenge even further. Flosbach added: "The challenge is really multiplied the more away you are from your originating market. Imagine a distance of some 1000 or 2000 kilometres. It is very unlikely that the risk appetite and understanding for a certain risk will be the same in your headquarters as in the project office abroad."

Finally, when it comes to disputes arising during projects, it is often about people. Anthony Lavers is a barrister with extensive experience of capital project disputes. He observed: "However sensible, commercial and experienced the organisations, when it comes to delivery of the project it comes down to people. The simple fact is that people interacting with each other can lead to friction. Disputes happen and they can get caused as much by just a personal battle as actual legal issues. One way of reducing the impact of such a situation is to change the people involved."

Some remedies for dispute resolution seek to provide a fresh perspective in such situations through the involvement of a person not directly involved in the project delivery. Sometimes, this might be by way of the parties to the dispute having the matter reviewed by their senior executives or by an outside third party. The problem, if it is not an outside party, is as Lavers pointed out: "The senior executives by definition may not be very objective in their approach to the settlement negotiations. A neutral third party, such as a mediator, will bring greater objectivity."

Q&A

RWE and E.ON have both recently changed their organisational structures for managing power plant capital projects. Is that to create more focus to deal with changing risk as multiple contracts become more common? What kind of 'people issue' benefits are you seeing?

Winfried Bröring, FD of RWE Technology: "RWE is managing the biggest capex programme we've ever undertaken. We've concentrated the management capacity for projects in one entity to enhance our approach, not just to risk but also the overall project management approach. On the people side, it helps you have a more open and direct culture in talking about risks, then dealing with them and transferring the knowledge of that solution from one project to another. Focusing knowledge also ensures you have a chance to have a common voice to the supplier market."

Torsten Flosbach, E.ON EKW project leader: "I'd echo those points. It's also about building specialism and expertise to respond to big capital programme requirements after a long period when no major new build activities had taken place. Utility companies are having to rebuild know-how and resources. Part of that is having continuous project management but such an approach is not so important for the rest of the business. So if you try to do it in existing structures, it isn't as strongly project-driven. For this reason, it makes good sense to have it in one single unit to concentrate and flourish it there."

You mentioned transparency as one of the major elements in gaining trust between suppliers and utility companies. What are the most important ways of building that?

Rainer Kiechl, CFO Hitachi Power Europe: "Tools and standards have their place but, at the end of the day, it is about people and relationships. If the project management teams from both sides are not meeting regularly, co-operating and speaking very openly, then you will not have success in the overall project. Transparency means having continuous talks during the project."

Michael Becker, CFO Siemens Fossil Power Generation Division: "Be open from the very beginning. If you are open and involve people at an early stage, you get more support for any challenges as you move forward. Don't hide things and wait until they get worse and you can't avoid them."

"Getting the finance right"

Just as the successful completion of a project relies on people, so the start of a project relies on finance. In turn, this typically means attracting greater equity in projects and the necessity of large amounts of debt. Two leading bankers – Roman Boguhn, Head of Energy & Utilities, DCM Loans, Strategic Asset Finance, Commerzbank, and Dr. Jürgen Franke, Co-Head Energy EMEA at WestLB AG – joined the roundtable event to discuss some of the important issues affecting finance for power sector capital projects.

*Present**

Massive investment needs for essential assets with a long life time such as grids and power generation

Available debt from financial institutions might not match this demand with respect to volume and tenor

Expected return on regulated assets does not seem to be in line with ROE expectations of major utilities

The EU is reported to be investigating ways in which it could facilitate project bonds to support the financing of major infrastructure projects

**Commerzbank*

*Future**

Will we see a change in the investor base for both equity and debt?

Will market participants rethink their roles?

Different financing for construction phase (incl. ramp-up) and for operational phase?

Shorter debt tenors/acceptance of refinancing risk?

Roman Boguhn stressed the importance of addressing the banks in the right way and structuring finance in such a way that it gives you room to overcome unforeseen difficulties. A recent project was a structured corporate financing for the Grosskraftwerk Mannheim (GKM) 911MW coal plant. The deal is akin to a corporate loan given the support from GKM's three industrial shareholders – RWE, ENBW and MVV – but has a project company-type structure. The loan is a five-year construction financing backing the four-year construction period.

The deal faced the difficulty of coming in the middle of the credit crisis. Boguhn recalls: "We needed €1.2bn which was a real challenge at a time when banks preferred not to have a final take of more than €50m." At the end, the financing was oversubscribed. "Talking to the banks and potential investors very openly and very early made a difference. Also, it was very important to balance the risk profile in a way acceptable to banks and the company/shareholders. In this case, making banks comfortable with the technical and operational know-how of the company, of course, backed by the shareholders' support, but without shareholders' guarantees for the financing."

The higher capital requirements and liquidity rules that come from the new Basel III regulatory standard for banks will affect the credit terms available to power projects. Boguhn observed: "We will probably have to look for a new model of financing. In the past, we saw power plant financing of up to 25 years. But, with Basel III, we will see that banks are not willing to lend big final takes on long tenors. Therefore, you may no longer assume you have financing in place at the beginning of the transaction which will stay until the end of the project. From my point of view sponsors should not be too worried about it. At the end of the day the refinancing risk remains with both the sponsors and the banks."

The financing of the massive planned offshore wind projects in the North Sea presents particular challenges. Siemens' Michael Becker points out: "if you look at an offshore wind park, you have to provide not only the wind park itself, you need the power connection into the grid, and you need a back up capacity, for instance, combined cycle power plant. There is a lot of capex necessary – maybe four times more than a normal combined cycle power plant onshore. Of course, you save something later on in opex, no doubt about it, but the up-front demands of capex need to be handled and are enormous."

WestLB's Dr. Jürgen Franke said: "Offshore wind is definitely on the upsurge, but not at the pace envisaged. It will simply need more time. Take a look at the maths. What we are looking at is a massive financing volume, but there are only a handful of players – sponsors, contractors, etc. – so there are limits, not just for the banks, but also for other investors and industry participants."

Following up on the challenge of offshore wind financing, Commerzbank's Roman Boguhn outlined his view of the roles of different parties: "My view is that banks should finance the construction and the ramp-up phase and then, for the operational phase, possibly we have to look for other means like bond financing so that we can really, as a society, finance all these infrastructure assets. The EU has recognised this and is reported to be investigating ways of making project bonds attractive for investors."

Q&A

In the pre-completion stage of the projects that you are financing, do you take the risk of a lump sum turnkey EPC contract or do you still ask for recourse from the project sponsors?

Roman Boguhn, Head of Energy & Utilities, DCM Loans, Strategic Asset Finance, Commerzbank: It really depends on the quality of the contract and, of course, the quality of the EPC contractor. But, normally banks are taking construction risk in cases where there is a good EPC contractor in place. We would hesitate to go for construction risk in new technologies. Proven technology is crucial for us.

What is the service coverage ratio that you would seek for a typical merchant power plant?

Dr. Jürgen Franke, Co-Head Energy EMEA, WestLB: Generally speaking banks would hesitate to provide long-term project financing for 100% merchant risk. But it does depend on the market and the exact type of financing.

Roman Boguhn: I agree. Full merchant from the beginning is something that my bank would currently exclude. There is too much uncertainty. But you might have a case where a power plant has some contracts in place and is, if you like, an 'emerging merchant'. If I think about the UK market in the past, with those kind of emerging assets, we saw coverage ratios of 2.5 or even higher to cover that risk.

Risk allocation can be pretty diverse, ranging from turnkey projects to multiple contract projects. If a client comes to you and he wants to run a multiple contract project taking more risk on his own side than a turnkey EPC one, how does this affect your evaluation of the project risk in your part of the deal?

Dr. Jürgen Franke: If the sponsors have good reasons not to opt for an EPC contract, then the question is: would they be prepared to provide more equity or standby equity/contingency tranches to meet the cost overrun? Or, otherwise, provide completion guarantees?

Roman Boguhn: It results in more due diligence. It has to be proven technology and the effect is that we definitely need a higher contingency. So if you, for example, normally have a contingency of 10% on the EPC contract, we would maybe, based on our due diligence, double that amount. If we talk about multi-contracting, we will not expect to have 60 contractors who tender but, for example, a bundle of eight or so. It is important that we are comfortable with the track record of the people in charge and that the project is team-based and not over-reliant on one individual to hold it together.

"Going past the point of no return"

"There is a key tipping point halfway through the development phase where you start locking in your options for how the project is going to turn out," observed PwC's Anthony Morgan. "You spend time at the front end of projects creating value, looking at your contract and procurement options, looking at the way in which the particular project can deliver returns to the corporate entity and, in most cases, to shareholders. But then you get to a point where you start losing your flexibility on how you create and retain value. You have locked-in the delivery of the business case and you are in the hands of the supply chain."

This 'point of no return' highlights the importance of getting things right in the preparation stages. Huge capital investments carry huge risks of misspending money. Getting it wrong can crystallise these risks in underperformance or impairments that can seriously harm the profitability of a company for a long way into the future. Morgan characterised the early phases of a project as 'value creation'. Once the 'point of no return' is passed, the implementation and delivery phases are, hopefully, 'value retaining' but, if things go wrong, they can be 'value destroying'. "Correctly setting up, managing and controlling the supply chain is one of the key success factor for projects," he stresses.

The type of procurement approach is an important factor in whether a project delivery turns out to be 'value retaining' or 'value destroying'. Traditionally, companies have looked to turnkey project arrangements to give them comfort. But RWE's Winfried Bröring warns: "If you think a turnkey supplier takes over most of the risk and that you will receive a project after the project execution phase which is delivered on time, budget and to quality, think again. The reality is sometimes different."

In general, power companies face a choice between the turnkey and the multi-contract approach. The former seeks to transfer risk to the contractor but this comes at a price. The power company retains control of risk in the latter but it places greater demands on its own project management capability. Most power companies engage in both types of contract with variants in between. Bröring said: "We use the multi-contractual approach mainly in the coal sector. The more you go into such an approach, the more your project management skills and capabilities need to be developed."

"Make sure you have a plan B. It's all very well identifying risks but that is no good unless you know what to do if they arise. So you need to identify countermeasures and be regularly revisiting and maintaining your backup plans – even for the very drastic scenarios as they can also help you cope better with the smaller ones."

Anthony Morgan echoed Bröring's warning that, whatever the contractual approach, companies should not take things for granted. "What we don't see enough, is clients really looking at the risks after contracting. Not just identifying and reporting the risks but deciding how you can mitigate them. The value is in actually mitigating and tracking the risks once identified to shrink them and try and ensure that they don't impact on your performance."

The need for effective risk management is all the greater with companies facing the need to adapt to a rapidly evolving regulatory and a more dynamic market environment. E.ON's Torsten Flosbach observed: "The changes that come from this more fluid external environment increase the need for more robust and integrated risk management (RM) during project execution compared to 'classic' project RM's focus on budget, time and quality only."

Flosbach emphasises the importance of aligning all the functional units of a utility company into the risk management of a capital project. "If a big project goes wrong, it has a serious impact and you don't want any disconnects." But the main reason for such functional integration is to prevent things going wrong or any nasty surprises in the first place. He particularly stresses the early integration of operational and maintenance staff into the very early stages of capital project planning. These are the people who will be managing the facility when it is ready and their input is important before it gets too late or too expensive to change things.

Q&A

Assume you had to negotiate a contract for a large power plant, would you try to shift more of the risk to your suppliers and, as a consequence, probably accept higher prices? Or would you be willing to accept and own the risk yourself and, therefore, have to risk management it more intensely and have more overheads?

Torsten Flosbach, E.ON EKW project leader: I think there is a clear awareness that there is not so much to be gained, at least if you operate an investment programme, if you try to shift too many risks to the suppliers. In most of the cases I would say it is more useful to grow and build the know-how in own staff. You can use that across projects and for future projects, instead of saving a few tens of people in headcount but paying in risk transfer towards the supplier. That does not mean I would let the supplier be risk free. I would do the exact opposite as far as I can, but the in-house resource has a long term benefit for the company.

Winfried Bröring, FD of RWE Technology: If you take the approach outlined by Torsten, you're in a position to achieve your first goal which is to know your risks. I'd be very wary of handing too much of that over, because there is always a chance the other party will evaluate it at a higher price.

If companies wish to procure on a turnkey EPC (engineer, procure and construct) basis, the reality is that there just a handful of suppliers with that capability. What does that mean for risk and who chooses who?

Michael Becker, CFO Siemens Fossil Power Generation Division: I think it varies in different parts of the world. In Europe we've seen more of the turnkey approach. But just to shovel it over to the other side and say 'I don't want to have the risk' doesn't do the project any good because, ultimately, you want to get the overall risk level down. It helps if both sides are involved. We definitely look at the risk level and are we able to manage certain risks. If a project is completely out of the range, we would be very clear about that. We try to help the client to understand risk levels and what are the limits of risks.

"Dispute avoidance and rescuing bust-ups"

If a capital project begins to go wrong, early action is essential. All too often, failure to recognise the symptoms of a distressed project and take appropriate remedial action can compound the issues, resulting in increased costs, further delays, failure to achieve the business objectives and, in the worse case, overall project failure.

But identifying problems and getting the different parties to agree remedies is not easy. PwC's Anthony Morgan, who often acts as an expert witness in project disputes, observed: "When a capital project runs into difficulties, one of the most difficult things to do is stop, plan and think; because everyone is trying to recover the situation. They're already working long hours because that's what people do when they try and correct performance which is not as planned and you get fatigue in projects."

Problems and disputes often lead companies to go down the road of formal dispute resolution or arbitration. Such a route is expensive and time-consuming. Morgan stressed: "It's only the lawyers that win. Dispute resolution is not a value adding process so I would encourage you not to go there." Picking up on this Anthony Lavers, a barrister with extensive experience of big construction projects in many different parts of the world, highlighted an increasing trend in contracts to have arrangements to avoid disputes and prevent escalation of disagreements.

Lavers pointed to an example of a contract used by the Institution of Chemical Engineers, used widely in the water and chemical sectors. The contract wording states that the parties are must try to avoid escalation of problems into disputes. Lavers went on: "I think it's worth considering ongoing mechanisms to avoid disputes occurring in the first place, such as both parties appointing a dispute resolution adviser (DRA) or project mediator, from the beginning of the project, who can act pro-actively to resolve any emerging issues."

Such processes are being used in some mega projects, including the facilities for the London Olympics which are being built using multi-tier contracting with dispute resolution panels. Lavers observed: "Multi-tier procedures are more expensive and complex but offer greater opportunities for early resolution." The use of a DRA has won high praise for its application in successful large capital projects in Hong Kong, for example Hong Kong International Airport.

"It's only the lawyers that win. Dispute resolution is not a value adding process so I would encourage you not to go there."

A Hong Kong government study showed cost savings and less time overruns on projects with a DRA. Mediation is another form of dispute resolution that can avoid problems being escalated and getting out of control. Mediation is a voluntary, non-binding, confidential, without prejudice, dispute resolution process in which a neutral third party helps the parties to try to achieve a mutually agreed solution. "Is it worth trying?" asked Lavers. "The verified figures from the main mediation institutions, which accord with my experience, indicate that over 80% of mediations result in a settlement at one stage or anther. Maybe not always immediately, sometimes later on, but the start has been made."

If mediation is a worthwhile process, should provision for it be put in the contract? Some take the view that you shouldn't make it mandatory, that it should be voluntary and for the parties to decide. "But the problem with that is, if you don't mention it in the contract, then it disappears off the agenda somehow," said Lavers. Parties are sometimes worried that including it makes it mandatory. One approach, used in countries such as Singapore and Malaysia, is to have a contractual provision for mediation but, for the avoidance of doubt, add a condition that it is not compulsory. Instead, the contract reminds the parties of that option and helps steer them towards it.

Lavers emphasised that "there is no single magic solution to the problem of disputes. Think at the outset what your dispute resolution mechanism is going to be. There is a menu of possibilities, which may be suitable for different types of project, different scale, jurisdictions and technologies. You need to think in considerable detail at the outset of a project just what the mechanism is. When the dispute has arisen, it is sometimes too late to try to discuss sensible mechanisms because, by then, the parties are not in a good relationship and are not discussing things in a sensible and adult way. So, there is a need to have provision from the outset of the project."

Q&A

Do cultural differences between countries provide lessons on the best way to avoid or deal with disputes?

Anthony Lavers, Barrister, Counsel, White & Case LLP: Cultural differences, between countries and between industries, are very significant. In the Far East, for example, great emphasis is put on discussion, consultation and attempts to reach settlement. Some more hard-nosed and aggressive industries and countries might view that with impatience and want to push on and get into battle on a dispute. But, maybe some eastern cultures, with their emphasis on avoiding damaging litigation and damaging public airing of grievances, have something to teach the rest.

I understand the 'open book' approach is used in the oil and gas industry. Is this a model which could also be applied to other industries, like the power industry?

Anthony Lavers: The oil and gas industry has got the best, and longest record, of collaborative working, partnering or relational contracting, of which open book contracting is the best example. Other industries have been slower to follow, although there have been big success stories for open book contracting in other industries. But the experience of the terminal 5 project at London' Heathrow Airport has caused a re-examination of open book contracting. Its critics point out that it is not a great success to deliver a project for X if it should only have cost two thirds of that. My personal opinion is that, as with most reactions, that is an over-reaction. Just as the supporters of open book contracting exaggerated its attractions, so now the critics who want to throw it all away are exaggerating. I would recommend anyone to have a look at open book contracting but I would look at it with a very careful eye.

Anthony Morgan, PwC: An approach that is becoming more popular now is target price contracting with a 'gainshare/painshare' mechanism. It's a sort of modified open book. You have a two stage tendering process. You agree a target and then you agree a gainshare/painshare mechanism on the basis that it's much better if you all manage the risk together - owner, designers, project managers and the supply chain. It relies on having cost and performance transparency. People need to be 'debadged' from their corporates and genuinely work together.

Review

A summary of the important points emerging from the roundtable discussion:

1. Don't underestimate 'people issues'. Remember that systems and controls are only as good as the people that implement them.
2. Correctly setting up, managing and controlling the supply chain is one of the key success factors for projects.
3. Establish a common language. It is essential that everyone has clarity on the performance of business-critical projects and confidence in each other's reporting.
4. Each company's project portfolio is different. Look at the 'materiality' of your risk and decide how much control you need.
5. If you operate an investment programme, be wary of trying to shift too many risks to your suppliers.
6. Be aware of the changing financing environment. Adjust your financing strategies to recognise the shorter tenors that are the new reality.
7. Don't rely on the contract. Manage the risks after contracting by early identification and mitigation of issues.
8. Align your functional units with the risk management of a capital project and develop appropriate management reporting so each function can play their part effectively.
9. Be clear about dispute prevention and resolution mechanisms from the start and draw on the lessons from other industries and cultures.
10. Think about knowledge transfer between people and projects. Don't lose knowledge and insight once the project has ended or the person has moved on.

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