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Nuclear energy global statement of capabilities

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Contents

your priorities, our professionalism...

...doing great work together

Our starting point is matching your needs with our nuclear power sector expertise, knowledge, professional objectivity and rigour. We aim to have a continuing dialogue, listening to your priorities, understanding your business issues, and delivering great work together.

Introduction

Nuclear power is an established part of the world's energy mix. The strategic role of nuclear power has come into focus as governments move to decarbonise their electricity generation while also responding to rising demand and concerns about energy security. Nuclear power provides a source of large-scale, baseload supply but its place in countries' clean energy strategies varies in the light of government responses to heightened safety fears following the 2011 Japan earthquake.

Nuclear power provides a clean energy opportunity but it also brings immense challenges. Safety, finances, very long timescales, skills shortages and considerable public and political scrutiny all add to the complexity of developing nuclear power projects.

The 2011 Fukushima emergency in Japan intensified these challenges but its aftermath has also seen a reaffirmation of many countries' commitments to the expansion of nuclear power. Different countries have reacted in different ways that reflect their own circumstances. However, the continued importance of nuclear power in the world's overall energy mix is not in doubt.

PwC works with companies, governments and industry stakeholders in every region of the world to assist with the decisions, planning and implementation of nuclear power projects.

Our team includes people with direct hands-on experience of planning, building and running nuclear power plants.

We are involved in many major current projects and can assist in all parts of the nuclear power lifecycle – from strategy and financing through to decommissioning and disposal of radioactive material. We can provide a wide range of skills and expertise, from engineering to business services, financing to IT.

This statement of our global capabilities is intended to give you insight into our experience and the ways we can work together to get you further ahead. Always, our goal is to understand your needs and add value from our knowledge and expertise.

Manfred Wiegand
Global Power & Utilities Leader

Philippe Girault
Nuclear Energy Leader Europe, Middle East, India and Africa

Chris Green
Nuclear Energy Leader UK

Christopher Fynn
Nuclear Energy Leader USA

Electricity generation from nuclear power worldwide is expected to nearly double, from 2,731 TWh in 2008 to 4,900 TWh in 2035. But this projection is likely to change post-Fukushima.*

Working together – PwC and the nuclear power sector

Few capital projects are as large and complicated as the construction of a nuclear power plant. Delays in construction have been an expensive problem, dampening project financing. Licensing, inspections, supply chain management and regulatory challenges all add to the complexity and long lead time. The hiatus in recent nuclear power plant construction reduces available project experience and expertise, adding to the challenges in many countries.

PwC can help governments and companies overcome these challenges. Growing energy demand, the need for cleaner, low carbon generation sources and the importance of replacing much of the current nuclear fleet are putting nuclear programmes back on the agenda in many national energy strategies.

Delivering on this new nuclear agenda means being able to respond to the big investment, safety and capital project challenges that are inherent to nuclear power projects. Events following the Japanese earthquake have heightened the importance of managing the risks of planning, construction, operation and decommissioning.

At a glance – why PwC?

- We have an experienced team of nuclear, mechanical and civil engineers, project management professionals, IT experts, lawyers, accountants, and other business service professionals with hands-on experience of nuclear facilities.
- We can help you plan ahead for the future while also drawing on past experience. We combine experience of current nuclear power plant construction with insight from the prior phase of projects in the 1980s.
- We offer a wide range of solutions in the areas of strategy and financing, project governance and controls, contract and regulatory compliance, risk management, and management of overall project performance.
- We can help with trouble-shooting or complex difficulties. We have experience on nuclear plant operational improvements, reliability-centred maintenance programmes, facility upgrades and complex outage-based maintenance and plant upgrade efforts. We also have experience of advising on and turning around construction delays and failures.
- Our global coverage means we are on hand wherever you need us and we can give you the best talent from around the world. We are recognised as a number one employer of choice in many key locations.
- We have extensive experience as independent advisers on major capital projects. We are on hand to help you manage the risks of project appraisal, planning and construction of new plant right through to handover and operation.
- We have a strong, positive reputation among power sector companies, governments and public utility regulatory bodies for providing objective, innovative, and reliable advice on financial effectiveness and risk.
- We provide world-class tax, audit, and assurance services to support and improve any business within the global nuclear sector.

Non-OECD countries are providing much of the impetus behind new nuclear power construction. About 40% of the growth in nuclear power comes from China alone. China has reaffirmed its commitment to nuclear power post-Fukushima. India is revamping its regulatory oversight with public concern becoming an important factor.*

** International Energy Agency, World Energy Outlook 2010, 'new policies scenario'.*

"Hands-on...

...with PwC you get a team with hands-on nuclear project, construction and engineering experience. Between us we have personal direct experience of nuclear power projects in all the major markets around the world."

"Why I hired PwC...

...I get calls on a regular basis from counterparts in other power companies asking me for advice. But what do I do when I need to talk to someone and get advice? I call PwC. That's why I hired them." (head of nuclear power programme, major utility company)

PwC takes the experience we have gained from our direct involvement in past and current nuclear power projects and other major capital programmes to help governments and companies move more efficiently and effectively through the complex lifecycle of a nuclear power plant.

Collaborating with our clients, we focus on four key areas that deliver value in the nuclear power lifecycle.

- ***Strategy and finance*** – generating strategies and solutions to financing needs and examining stakeholder relationships for appropriate spread of responsibilities and risk.
- ***Contracting and delivery*** – supporting the engineering, procurement and construction phase of nuclear plants with comprehensive governance structures and control environments, leveraging new quantitative risk analysis tools that are being used at nuclear construction sites to help owners and contractors foresee and manage risks.
- ***Start up, operations and maintenance*** – implementing an enhanced systemic approach to guiding asset configuration and enabling long-term, reliability-centred operations and maintenance during the handover of a nuclear power plant from contractor to owner operator.
- ***Decommissioning and disposal*** – supporting clients through the complex decommissioning process associated with nuclear plants, helping to manage risks, maximise asset value and minimise costs.

The nuclear business lifecycle...

...on the following pages, we show how we work with you all the way through these phases of the nuclear business lifecycle...

With you all the way through the nuclear business lifecycle

Strategy and finance

Building a new nuclear plant presents immense financing and strategic challenges. Even those companies who are focused on the nuclear power sector have to face huge demands on their balance sheets, sometimes necessitating sales of non-core assets. The strategic rationale for the project – such as its market and portfolio fit, its contribution to growth and shareholder value, its timing – needs to be very clear. Financing is a major challenge, especially during construction when the project is vulnerable to cost overruns.

Companies face a number of strategic choices. They have to consider the place of nuclear in their fuel mix, particularly at a time when competition from gas and renewables is evolving fast. They have choices about the extent of partnership with others, in particular whether to share the development risk through a joint venture. They need to manage the challenges that arise when there is a complex equity mix of investors. They also have to look hard at their own capabilities for delivering the project which, in turn, will have an impact on the nature and extent of partnerships.

The steep change in the design of plants, combined with the overall safety premium for nuclear, adds to the costs and timescales of already capital intensive programmes. Government has a role in boosting the confidence of lenders by demonstrating stability in policy frameworks and by being clear about the roles and responsibilities of different actors with regard to nuclear waste management. It can also support the industry by ensuring electricity wholesale markets are fair, supporting nuclear power as required, and by ensuring that the planning, licensing and permitting processes are clear.

How PwC can help

Market and portfolio analysis

We can conduct the analysis required to show how the project fits with the market, with your risk appetite and with the rest of your generation portfolio. We use a range of modelling techniques to give you a clearer picture of the strategic context of the project and, in particular, the extent to which it fits your company's risk profile.

Assessing the best financing arrangements

Companies can take many steps to help their financing position. Step one is to pursue good structuring at the project development stages – utilising alternative financing resources such as export credit agencies, good contract structure, and recognition of electricity markets to secure early rate recovery in regulated markets or off-take agreements in merchant markets.

- *Contract financing* – where downstream power off-take sales are leveraged against upstream debt to guarantee the borrower's position in a regulated market.
- *Co-operative finance* – where the construction and operation costs and liabilities are provided by joint-venture shareholders and government.
- *Traditional financing of a nuclear new build company* – through a combination of joint-venture ownership and equity and limited recourse loans, leveraged against agreed power purchase agreements for off-takers.
- *Drawing rights* – where a joint venture ownership structure raises finance through debt and limited recourse loans and finances the project entirely through equity. The shareholders are then entirely responsible for the operation and capital costs.

PwC services

- Generation portfolio planning.
- Market and regulatory assessments.
- Feasibility studies.
- Organisational design.
- Project finance structuring.
- Deal strategy, structuring and execution.
- Capital program risk assessment.
- Regulatory and policy advice.
- Financial modelling.
- Funding options appraisal.
- Due diligence.
- Public/private partnership advice.
- Tax modelling and incentive analysis.
- Total tax contribution.
- Carbon finance and advice.
- Milestone mapping and stage gate reviews.
- Stakeholder management and communications.

The project has not only got to work in commercial and financing terms but the capability also has to be in place to manage and deliver it effectively.

While risk will dictate financing and refinancing decisions at various stages of the lifecycle, comprehensive controls can help to both manage costs and increase the confidence of project financing lenders. It is a way for project owners to demonstrate that they fully understand construction risks and have adequately quantified that risk in their construction estimates.

Evaluating organisational capabilities and readiness

The project has not only got to work in commercial and financing terms but the capability also has to be in place to manage and deliver it effectively. PwC can review your organisational capabilities, assessing gaps and, in turn, look at the implications for partnership arrangements, risk sharing and project design.

Governance and project design

We can help you establish the right governance framework to fit your project circumstances. We can also help you think through all the things that need to be covered in the project design. For example, this is the stage to think ahead about enterprise asset management arrangements. Evidence shows that infrastructure owners could cut their asset lifecycle costs by up to 20% if they used asset-related data better. Bringing together the interests finance and engineering have in asset performance early in the project lifecycle helps establish greater project discipline by demanding systematic documentation of business needs, schedules, and costs.

Working together – Teollisuuden Voima Oyj (TVO) and PwC

Context

We were advisers to TVO in Finland on the approach to private sector funding for nuclear development. Finland has a high dependency on energy to fuel its wood pulp industry. TVO is a non-listed public company founded in 1969 to produce electricity for its company shareholders at cost price. It operates on mutual principles for its industrial and energy utilities shareholders.

Deliverables

PwC's involvement on the funding strategy followed an earlier assessment for TVO of its options for major power expansion. Once the nuclear energy option had been decided on, we were asked to look at how TVO could put together a funding package and how it could best access the market to get the skills it needed to get the new power station built. Our work included:

- analysis of the access to private sector finance
- preparing a project implementation agreement in preparation for discussions with shareholders and other interested stakeholders.

Comment

"Not only was this the largest single investment in Finnish industrial history so far but the mutual developer and operator model was unique. Many observers felt it would be difficult to put together a funding structure for a new nuclear power station that wasn't within the usual big utility model. The project also came after a long period when there had been no new nuclear build with the result that investors were unfamiliar with such projects. We overcame these difficulties and also addressed issues such as the effective financing and management of nuclear waste costs." (PwC)

With you all the way through the nuclear business lifecycle

Contracting and delivery

Building a nuclear plant is one of the most complicated capital projects in the world. The successful delivery of these complex projects requires a thorough contracting strategy and a structured control environment designed to manage numerous project risks throughout the project lifecycle in a transparent fashion. The process must stand up to intense government, regulatory and public scrutiny. It must also be able to handle the extreme complexity of nuclear permitting, licensing and construction along with the difficult transition to start-up and then to operations.

Historically, nuclear power plants have faced numerous challenges during construction due to unforeseeable scope changes, cost overruns and schedule delays. The next generation of nuclear power plants face new risks and challenges, which need to be managed through strong project governance and comprehensive control environments. The governance approach must clearly lay out the framework and accountability for project execution, oversight and assurance.

The control environment must include transparent processes and procedures to manage all project risks and include meaningful analytics to assess and report on critical project performance metrics. Project participants must maintain a clear and accurate document trail to meet the significant government and regulatory requirements to demonstrate the reasonableness of management processes and that the nuclear plant can operate in a safe and reliable fashion.

PwC services

- Baseline assessment of project control environment.
- Governance structure.
- Vendor assessment and tender process support.
- Sourcing and procurement strategy.
- Advice on contracting strategy and commercial terms.
- Process design and development.
- Supply chain and logistics planning.
- Organisation design and optimisation.
- Systems assessment, design and implementation.
- HR assessment and succession planning.
- Independent project adviser throughout project execution.
- Cost to complete modelling.
- Schedule, scope and cost analytics.
- Quantitative risk assessments.
- Programme and project management.
- Ongoing regulatory and cost recovery advice.
- Dispute avoidance and resolution.
- Continuous process improvement.
- Document and information management.
- Reporting and external communications.
- Controls testing and project assurance.
- Project risk management.
- Construction fraud assessments.

How PwC can help

Helping establish a contracting strategy to create an acceptable project risk profile

The project contracting approach and commercial terms need to balance risks and rewards among project participants and clearly set out accountability for specific performance parameters. We can help you devise a contracting strategy that fits with your risk appetite and capabilities and draws on successful practices we have observed in the global engineering and construction environment. We can help you analyse and assess the market and understand the advantages and disadvantages of the different delivery options and contract commercial terms, highlighting how the risk profile created by your contracts affects your future staffing and management approach.

Effective governance and performance management

Project governance is an active and ongoing role as opposed to a static controlling one. Combining our nuclear, engineering, project management, accounting and consulting experience, PwC helps our clients manage contracts and requirements, hold the project management team and contractors accountable, continually identify issues and risks, establish timely risk mitigation plans and escalate issues when management attention is required. In nuclear construction, this requires a comprehensive suite of control tools and procedures to address detailed planning and scheduling, active change management, cost controls, risk management, quality controls, safety management and contract administration. It also requires detailed control analytics that regularly analyse performance parameters and report timely, relevant and accurate metrics to senior management and project stakeholders.

Strategy and finance | ***Contracting and delivery*** | *Start-up, operations and maintenance* | *Decommissioning and disposal*

Project governance must be robust enough to stand up to intense regulatory and public scrutiny. PwC can help you establish the right governance framework to fit your project circumstances.

Helping keep scope, schedule and costs under control

Based on our experience with prior and current nuclear construction projects and other mega-projects around the world, PwC has developed a variety of analytical tools to help project participants assess scope, schedule and cost performance throughout the project lifecycle. With control analytics, a project management team can proactively analyse the performance of a project and its associated risks through the use of modelling tools and techniques to identify those risks that have the highest potential for significant adverse project execution consequences.

These tools include quantitative risk assessments (QRA) using stochastic models to quantify project risks and provide management insight into forecasted cost to complete project elements, ranges of project completion dates and estimate contingencies. QRA helps establish data trends and metrics and can analyse risks over tens of thousands of computer generated iterations using probabilistic methods of analysis to aid decision making. We also perform detailed schedule analytics providing management deeper insight into schedule trends and early warnings of schedule risks.

Being a trusted adviser to your project management team

We can be on hand to continually evaluate your project management controls, capabilities and documentation and provide regular observations and recommendations for process improvements. With the breadth and depth of our experience on nuclear and other major capital projects throughout the world, we can compare your practices to other successful industry practices and highlight where effective practices on other projects could be adapted to your specific situation. With PwC, you gain the reassurance of an experienced and expert outside eye, offering support and challenge when needed, enabling you to identify and correct oversights and make changes in time to keep your project on course or minimise disruption.

Working together – Southern Nuclear and PwC

Context

Southern's US$14bn investment in the two new Vogtle 3 and 4 units at Waynesboro, Georgia will be the first new nuclear plant on US soil in 30 years.

Deliverables

PwC's team was selected to provide hands-on execution and advisory help on the biggest, riskiest, most politically charged construction project the utility had ever tackled. PwC is supporting the company through a myriad of construction-related tasks and issues including financing, regulatory matters, schedule analytics, continual projections of end costs, and the numerous challenges associated with managing contracts worth billions of dollars.

Comment

"With such a time gap from previous projects, the project consortium faces the challenge of re-establishing expertise and getting back up to speed. The PwC team is able to add considerable experiential know-how. It includes people with substantial engineering and project management experience, including direct experience of previous nuclear projects." (PwC)

By carefully managing assets across your portfolio, your organisation can improve utilisation and performance, cut capital costs, reduce asset-related operating costs, extend asset life, and improve your return on assets.

With you all the way through the nuclear business lifecycle

Start-up, operations and maintenance

Commissioning a nuclear power plant involves a massive transfer of knowledge, information and data from the builder to the owner and operator. With a nuclear plant, many different contractors and vendors will have spent years installing several hundred thousand components of interest – large and small. Ultimately, it is the owner's responsibility to be able to prove that what was designed is what was built, and what was built is what is being operated.

Over the life of the construction process, critical data often gets scattered among different construction units. Scattered data has consequences for all critical areas, including safety. Safety is the number one priority of any nuclear plant. Asset configuration lays the groundwork for safety.

Enterprise asset management (EAM) is central to delivering required asset reliability, safety, and cost objectives. In addition to the safety consequences of asset failure, the cost of reactor down-time is high, amounting to more than US$1m a day in lost revenue for a 1,000 MW reactor.

Designing EAM into the plant during construction reduces capital costs and allows utilities to achieve desired capacity factors, utilisation, and performance far earlier in the operating phase. Asset management is not only a question of maintaining existing assets, but also of improving assets over the long term.

Effective EAM does three things for companies: 1) ensures a plant is available, reliable, and fully functional; 2) minimises costs over the lifecycle of the plant; 3) manages risk in the form of promoting personnel safety, protecting against environmental damages and preventing the loss of production or availability.

How PwC can help

Effective enterprise asset management
By carefully managing assets across your portfolio, your organisation can improve utilisation and performance, cut capital costs, reduce asset-related operating costs, extend asset life, and improve your return on assets.

Building asset management right up front
We can help make sure you think about asset management right at the beginning of the project planning. Planning ahead of the contract stage how you will get the data prepared and transferred can save a lot of money and headaches later. If aspects are overlooked, they can be tremendously expensive and difficult to remedy.

PwC services

- Detailed scheduling and logistics support.
- Operations readiness reviews.
- Operational process design and optimisation.
- Enterprise asset management (EAM).
- People and change management.
- Document preservation and warranty maintenance.
- Retirement unit management.
- Reliability-centred maintenance (RCM) design and implementation.
- Materials management systems design and implementation.
- Operational improvements and cost reduction.
- Facility lifecycle assessments.
- Supply chain improvements.
- Maintenance and nuclear fuel contract reviews and audits.
- Tax compliance and performance improvements.
- Operational fraud assessments.
- Project uprate assessments.
- Steam generator and reactor pressure vessel head replacement programme support.

Managing asset handover
Contractors and operators both need effective systems to manage handover. Such systems need to meet the needs of both sides and adequately address specific project characteristics and imperatives. We can help develop appropriate systems and advise on their implementation.

Maximising asset performance and reliability
Are the methods used to optimise the plant's performance and reliability the best they can be? Developing a reliability repository for the design is an important step. We can help companies develop and use reliability centred maintenance (RCM) analysis to rigorously assess all facets of plant reliability. We can also advise on a range of performance improvement techniques to help you get the best operational performance from your asset.

Working together – China's Daya Bay nuclear power station and PwC

Context
Daya Bay is the largest operating nuclear complex in the world. PwC assisted the Daya Bay Nuclear Management Company (DNMC), and its holding company China Guangdong Nuclear Power Corporation (CGNPC), to implement SAP's ERP and EAM solution at three existing power plants for six operating reactors. This solution will provide Daya Bay's management full financial and enterprise asset management, coordinating everything from daily plant operations, maintenance, supply chain, and financials.

Deliverables
The project was completed in less than 18 months. The full original project scope was completed on time and on budget. The business scope included end to end finance, costing, supply chain management, work management, asset management, plant operations and blocking, and HR time entry. The solution is the foundation upon which CGNPC can manage its fleet of five other nuclear sites (20+units) currently under construction.

Comment

"CGNPC needed to be able to demonstrate world class business controls, practices, and transparency to participate in world financial markets and to adhere to world nuclear safety standards. The project was able to deliver clear and verified reporting into a complex multitude of processes, organisations, and tools. Another system integrator had failed. DNMC was in the unenviable position of having a project that had to be restarted from the beginning. The project included a team of PwC American ERP/EAM experts integrated with a team of PwC China consultants with further support from our Global Development Center (GDC) in Beijing." (PwC)

Working together – British Nuclear Group and PwC

Context
BNFL had just one year to shift from owner-operator to become a Manage and Operate Contractor. Within two years of its rebirth it would need to compete for contracts against the private sector. PwC was a key delivery partner for BNFL and the new company, British Nuclear Group (BNG). Moving from public to private sector ethos, and from operator to niche service provider, was one of the most complex restructuring programmes in Europe at the time.

Deliverables
PwC supported the review of key business processes with a view to implementing better cost management disciplines, essential if the business was to be competitive. We helped BNG interpret and respond to the new reporting requirements and design the necessary infrastructure, applications, data and report configurations to deliver them. We also carried out a training needs analysis and subsequently managed the delivery of training and communications to prepare staff for the new business model. By deadline day, 15,000 people across 14 nuclear and other support sites were transferred into BNG, 3,000 switched to new IT systems, and staff had been retrained and given fresh career paths.

Comment

"A lot of our people were nervous facing the restructuring of our entire industry and fundamentally changing how we go about our daily jobs. PwC helped us to plan in detail, so not only did we have a picture of where we wanted to go, we could see the steps, resources and key enablers we would need, and importantly, we knew the obstacles and problems we would encounter. So when issues surfaced, as they always do, we were able to proactively manage them. Despite our natural cautiousness, having that clarity in advance meant that at no time did our programme ever lose momentum." (Brian Tenner, Finance Director BNG (until 2010)

The future use of decommissioning sites also adds to the complexity. Many will be used for new nuclear power plants, raising the bar on the requirements of the project.

With you all the way through the nuclear business lifecycle

Decommissioning and disposal

Normally plants last about 40 years before being taken out of service. Costing millions of dollars, the decommissioning process is lengthy, complex and expensive – requiring extensive planning and effective governance to attract financing and to contain costs and risk.

The challenges of decommissioning are many. A clear strategy has to be defined with all the uncertainties of long timescales, site locations, public anxiety and scrutiny and waste management. Cost and financing present special challenges, not least because of the need to create an appropriate business model and identify future costs when there may be uncertainties about exact waste management arrangements.

The challenges are created partly by the lengthy timeframe. This affects operations as well as the overall financing framework. For example, with many of the current nuclear plants built in the 1960s, crews are not sure what variations they will face during the fuel removal and storage processes, making the costs unpredictable. The future use of decommissioning sites also adds to the complexity. Many will be used for new nuclear power plants, raising the bar on the requirements of the project.

Nuclear decommissioning and clean-up is a relatively new industry globally. Developing a workforce with the right skills is also a major challenge. The decommissioning process requires a breadth and depth of expertise to minimise risk and costs. Specialist experience gained in nuclear plant operation may not always be directly applicable to decommissioning. The industry's dormant construction cycle has created an experience gap or, some would say, a critical shortfall in nuclear expertise.

How PwC can help

Building decommissioning in from the start

Most new nuclear builds today require some form of 'liabilities fund' which is material to the initial financing, yet requires a good understanding of the end of lifecycle costs. It is therefore essential to understand the full nuclear lifecycle from both a financial and operational perspective in order to finance and manage decommissioning.

Planning the best decommissioning approach

Decommissioning and the issue of legacy waste from old installations need to be planned at the very start of a project. We advise governments and companies on planning options, their effect on liability and which ones work best. We have a decommissioning planning approach which is strong on the stakeholder management and engagement that is essential for an effective solution.

PwC services

- Business evaluation for investment/divestment.
- Disposal strategy.
- Negotiation advice and support.
- Restructuring and regulatory impact.
- Asset valuations.
- Decommissioning cost modelling and benchmarking.
- Corporate finance advice.
- Privatisation assistance.
- Deal structuring.
- People and change strategy.
- Environmental impact assessments.
- Lifecycle assessments.
- Asset management.
- Post-merger integration support.
- Deal value optimisation.
- Tax strategy and advice.

Strategy and finance → *Contracting and delivery* → *Start-up, operations and maintenance* → ***Decommissioning and disposal***

The very long timescales can stall decision-making on decommissioning. You need to be adept at devising interim target measures to deliver momentum and maintain performance.

Technology transfer and learning between decommissioning projects

We understand the importance of capturing and sharing learning between different decommissioning projects. We can help to identify innovative ways of transferring technology and learning so that companies and governments can benefit from efficiencies and reduce costs.

Managing and delivering decommissioning

PwC is experienced in how to bring a plant out of service. Decommissioning companies hire us to assist with their cost level controls, explore financing considerations and to put in place strong governance. We also help clients who are concerned about funding to establish solid and relevant financial controls so they have confidence they are spending their investors' money appropriately.

Working together – UK Nuclear Decommissioning Authority and PwC

Context

PwC has been appointed by the Nuclear Decommissioning Authority (NDA) to provide advice on the financing options for a radioactive waste geological disposal facility. The importance of a long-term strategy and funding framework for geological disposal becomes more and more important as decommissioning of existing plant becomes due and existing storage facilities near the end of their planned life. A proposed EU directive requires national programmes, indicating when, where and how member states will construct and manage final repositories aimed at guaranteeing the highest safety standards.

Deliverables

PwC's work for the NDA involves:

- analysing the alternative options available for project development under a range of public, private and PPP delivery variants based on international experience in the nuclear sector and of PPP more generally
- defining a limited number of well defined options for the financing of the new radioactive waste geological disposal facility
- considering financing options in the context of the nuclear industry and other sectors, in the UK and internationally, and;
- developing a high level consideration of the merits of the options proposed.

Comment

"One of the key factors in financing a new nuclear power station is making sure the costs of long-term waste management are well understood. The NDA project on the siting, financing and charging options for geological disposal facility will be very important for the development of the next generation of nuclear installation. The outcome will be a vital part of the business model assumptions for these projects." (PwC)

Worldwide reach

Our people

Our nuclear power expertise is spearheaded by three practice leaders, a network of 25 lead specialists, over 100 people worldwide with nuclear power experience and three global centres of excellence, located in France, the UK and the US. Our centres of excellence enable us to deliver a depth of expertise that can be leveraged across the PwC network. Our people come from a variety of professional specialities, including nuclear, mechanical and civil engineers, accountants, project management professionals, IT experts, and other business service professionals. We have extensive experience in the utility industry, having worked with most of the major public utilities and energy companies throughout the world on a wide variety of projects.

Our knowledge

Our worldwide network is linked by a sophisticated internal knowledge management system, giving our people the tools to input their insights and draw upon the most up-to-date information for the benefit of our clients. Our programme of power sector 'thought leadership' is widely respected. From roundtable discussions to global surveys, we share knowledge with our clients on industry issues. Each year, we prepare industry-dedicated reports and gather opinions on the issues that are of key strategic importance to our clients and the challenges that lie ahead. Our knowledge draws on the insight of our worldwide network of industry specialists as well as the industry itself.

Our reach

We can be wherever you need us to be. We work with all types of nuclear power, engineering and construction companies and industry stakeholders in different markets. Backed up by a network of over 4,000 staff dedicated to the utilities industry and a PwC presence in 154 different countries, we are on hand to meet your requirements whatever the location.

PwC – on hand where you need us worldwide

Over 4,000 utilities specialists...

In 154 countries...

More than 100 people worldwide with nuclear energy experience...

PwC global power & utilities centre of excellence

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PwC – nuclear energy projects around the world...

South African nuclear power: PwC advising on advanced technology investment...

Eskom, the South African state-owned electricity company, is the lead sponsor in the Pebble Bed Modular Reactor (PBMR) development consortium. The project is centred on an advanced fourth generation nuclear reactor design. PwC was asked to advise on the viability of this new technology and whether further investment could be justified in the development business. We created two models. First, a utility operator model to evaluate and develop a set of high level financial statements for a plant being owned by a utility as operator. Second, a PBMR business plan model, based on a range of scenarios for international sales of PBMR reactors. This included assessing worldwide developments and opportunities in nuclear power, undertaking an economic analysis of the position of nuclear generation in the South African electricity market, and assessing the business plan and undertaking modelling for the subsidiary developing a fourth generation nuclear reactor.

Improving the operation of existing assets: PwC in the US...

Pacific Gas & Electric's Diablo Canyon nuclear power plant in San Luis Obispo County, California, wanted to replace their aging PIMS legacy work management system with an integrated enterprise system to enable continuous business improvement. PwC worked with PG&E to successfully implement EAM and SCM solutions on PG&E's ERP system, establishing business processes which are integrated across the enterprise and incorporate leading nuclear practice. INPO guidelines were used for work management and reliability processes. The implementation "Go live" was accomplished very smoothly based on PwC's process-based training approach – with a major outage executed 3 months after go live. Diablo Canyon is an INPO 1 plant with a capacity factor above 90%.

Uranium enrichment business: PwC and valuation advice...

In the context of a the sale of a minority stake, PwC gave a fairness opinion on the value of a company that operates uranium enrichment facilities in Europe. Our approach included an analysis of the energy and uranium enrichment market analysis, looking at factors such as the prospects for growth, and a market trends analysis, including economic, regulatory and environmental, that may affect the value of the company. We reviewed financial projections and underlying assumptions including revenues, operating margins, working capital requirement and investment. We also conducted sensitivity analysis on key value drivers – electricity prices, euro/dollar exchange rate and uranium prices. Our valuation included a consideration for dismantling costs consideration and the company's social obligations such as retirement and pension benefits.

European nuclear power partnership: PwC supporting accounting and tax structures...

Two major European electricity companies have signed a strategic partnership agreement concerning the construction of a power plant. Under the terms of the agreement, the strategic partner is acquiring slightly more than 10% stake in the plant by contributing to the financing of the investment and gaining access to a proportion of the electricity produced equal to its stake. PwC has assisted in several key areas including the accounting and tax treatment of the project agreement, of the amounts paid during the construction period and the amounts paid during the operating period. We also dealt with the accounting treatment of the know-how transfer agreement in the individual financial statements.

Securing uranium resources: PwC providing acquisition assistance...

PwC assisted a major player in the nuclear industry in the context of the acquisition of a listed company engages in the acquisition and development of ore and uranium properties worldwide. This acquisition was part of the company's strategy to increase significantly its capacity of uranium production. Our work included financial and tax due diligence, assistance for 'day one' readiness and identification of key people and associated risks. We also defined the post-merger integration plan, provided an update of the acquisition business plan after the acquisition, handled the price purchase allocation and prepared the consolidated accounts.

Russian nuclear power: PwC supporting restructuring and strengthening corporate governance...

The State Atomic Energy Corporation Rosatom (Rosatom) manages all of Russia's nuclear assets, both civil and military. PwC was asked to advise on options for the development of Rosatom's corporate governance system and identify possible legal limitations, resulting from its organisational form as a state corporation and the nature of its business in nuclear energy. PwC worked closely with the company's senior management in planning and designing a new corporate governance system. The project plan was structured around four major steps: 1) preparation of options with an overview of the mechanisms available for corporate governance development;
2) a review of the main risks connected to each option and conducting limited due diligence;
3) the development of an action plan for the implementation of the option chosen by the company; 4) drafting of documents necessary for implementation. PwC provided distinctive value by helping Rosatom manage significant change in its organisational and management structure. Our experience in corporate governance and restructuring projects, our approach to SSC establishment and outsourcing, in close coordination with PwC tax specialists and the company's management, were important in dealing with the complicated issues raised during the project.

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