

Industries
Energy, Utilities & Mining

Smart solutions for smart grids

Capability statement



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Your partner in a more efficient energy future Our response to your smart grid challenges

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A smarter approach


Behind the hype, there is the reality. The era of smart grids is set to deliver real improvements. A range of technological innovations are, together, expected to make possible a step change in grid efficiency, facilitate automation to reduce cost and improve quality, enable the integrated and optimal use of distributed and renewable generation, and promote interaction between supply and demand technologies and between the consumer and the utility that will provide benefits for both.

But this future comes at a cost and with immense challenges along the way. It requires substantial capital investment. It means transforming the grid from an electromechanical system to a fully digital system. Its full potential requires much to happen on many different fronts. Companies face tough dilemmas on the timing of investment, choice of technology partners, how to maximise the cost-benefit to their company as well as the wider grid and society and, last but not least, the key challenge of delivering the necessary upgrades efficiently and on time.

PricewaterhouseCoopers can help bring effective rigour and challenge to the decisions that companies need to make at all stages of smart grid development and implementation. We have extensive experience of helping companies assess and roll-out smart grid programmes in all the major power markets around the world. Our goal is to help our clients deliver on their smart grid ambitions in a way that gives them maximum value and competitive advantage.



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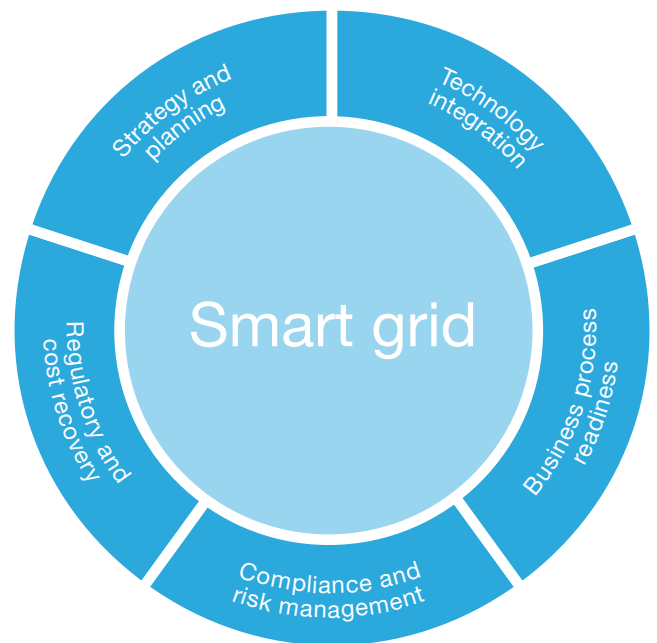
02 A smarter approach

Our response to your challenges

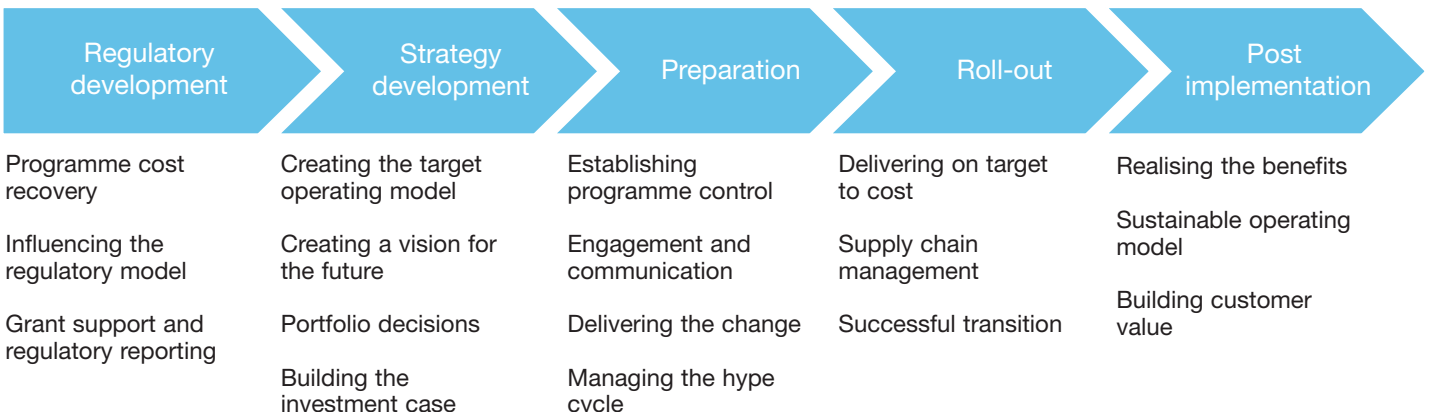
Whatever the stage of your thinking and roll-out of smart grid initiatives and wherever you are in the world, PricewaterhouseCoopers can help give you momentum. Our approach focuses on the full lifecycle of smart grid initiatives and touches all aspects of what needs to be considered.

- **Strategy and planning** – business case development, alignment of the smart grid plan to organisational strategy and overall project management.
- **Technology integration** – selection and implementation of technology and IT solutions to support smart grid initiatives.
- **Business process readiness** – optimisation of critical processes to ensure the value of smart grid investment is achieved
- **Compliance and risk management** – validation of all compliance/contractual obligations to ensure they are achieved and managed.
- **Regulatory and cost recovery** – alignment of initiatives with market, regulatory and stimulus requirements.

We help companies address the issues that will be key to success all the way along the project life cycle – from optimising the regulatory environment through to roll-out and maximising the smart grid opportunity post-implementation.



Success factors



Global capability in smart metering and grid modernisation

Canada

Smart metering strategy and business case, grid modernisation vision, procurement and negotiations, and financial modelling for a major utility.

Norway

Outsourcing of metering, settlement, billing and debt collection, relating to smart deployment.

United Kingdom

Smart metering business case development and modelling experience. Mergers and acquisitions experience within the metering landscape.

France

Smart metering deployment analysis in order to secure internal and legal reporting production and publication.

Netherlands

Smart metering programme business case analysis and development.

Australia

Currently assisting development of a consistent national framework for the rollout of smart metering infrastructure across the Australian electricity market to small customers.

United States

Smart metering implementation programme and transformation management including regulatory support, risk management, scheduling support, process design and related CIS upgrade and implementation.

Austria

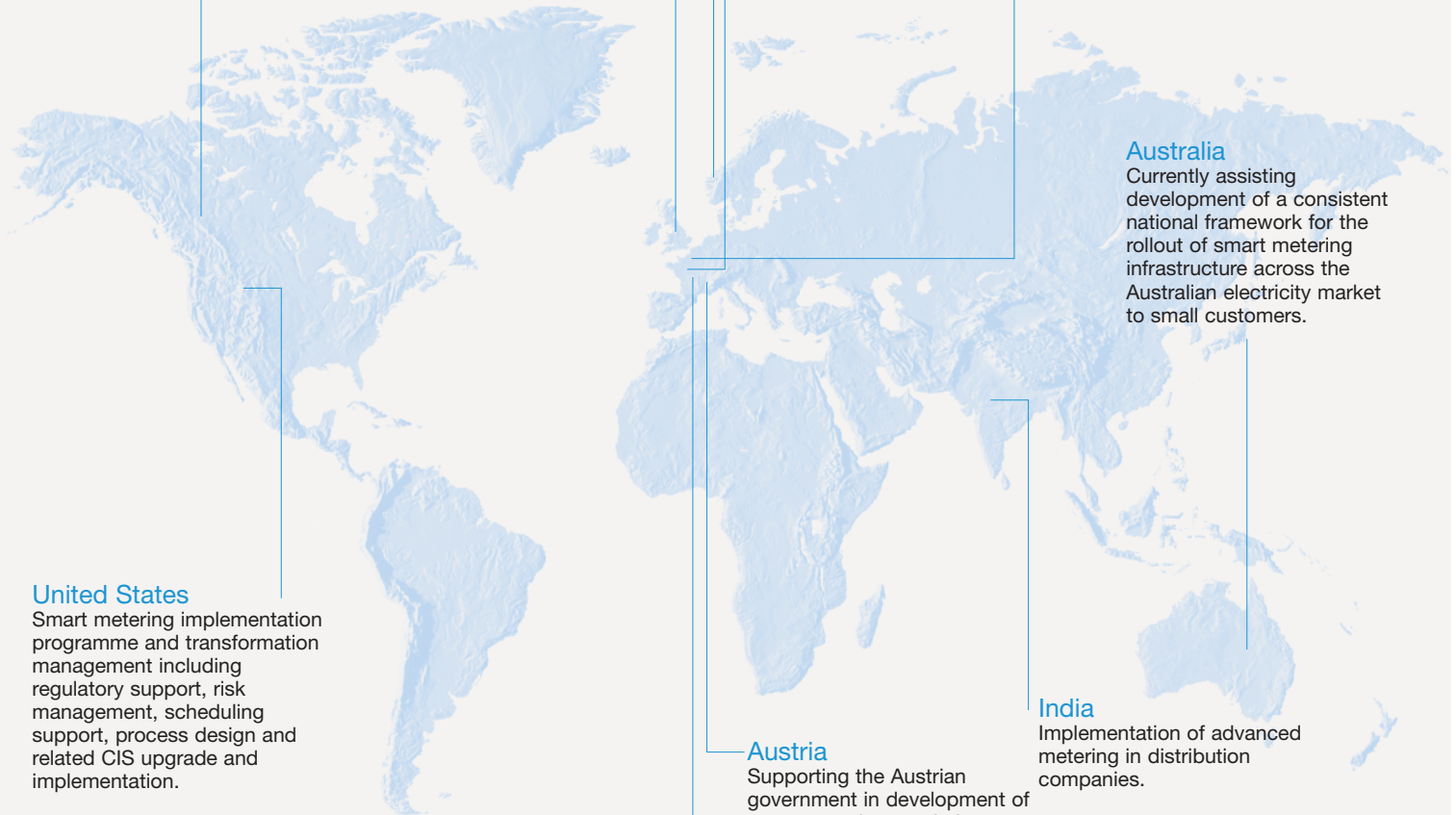
Supporting the Austrian government in development of smart metering regulation.

Germany

Advising on implementation of smart metering and Implementation of IT solutions for smart metering. Issued sector survey – 'State of realisation and strategic implications for the German utility market'.

India

Implementation of advanced metering in distribution companies.



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Smart infrastructure industry convergences

The development of smart grids is forming a constellation of industries gravitating around power utility companies. This has implications for how companies identify, select and make the most of collaboration with partner companies. Speed, agility, reliability and commonality of vision will all be important considerations in alliance relationships.



Regulatory development

Developing smart grids and renewing energy networks requires a regulatory regime that will encourage timely investment and effective programme delivery. Just as smart grids aim to provide a dynamic and interactive infrastructure, regulatory dialogue needs to be a two-way process.

Regulators and companies alike are embarking on a journey where the business case roadmap and incentives need to be clear but, also, where there is the flexibility to allow innovation, make adjustments in the light of experience and maximise new opportunities along the way.

We help regulators and utility companies alike mitigate risk and ensure that the design of regulatory frameworks is optimised and that they are getting the best out of them once they are in operation.

As utility companies design and deploy smart grid projects, they need to understand the best approach to maximising full cost recovery of the investment. PwC can help utility and power companies interact with regulators and governments on:

Programme cost recovery

Advising utilities and regulators with regards to developing the business case for roll out including forecasting customer, environmental and operations benefits

Influencing the regulatory model

Supporting companies and regulators in developing the optimal regulatory regime. PwC can provide regulatory scenario impact analysis and modelling for a variety of regulatory options.

Grant support and regulatory reporting

Evaluation and support to optimise use of government grant programmes. Assistance with periodic utility reporting requirements to external parties, addressing project performance and compliance with regulatory mandates.

Regulatory development checklist

What is the best design for the regulatory model?

Do you know the options and the impacts on your business?

Are you able to influence the process effectively?

How will this change the game?



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Strategy development

Developing a smart grid demands a strategic vision that covers a wide compass. Smart metering is a key starting point but a smart grid involves much more. Among other things, it involves laying new advanced high-voltage transmission lines, modernising substations and gathering and managing prodigious amounts of data. It means forming new alliances and charting a strategic course in a world of convergence.

Companies need to evaluate their operational and regulatory landscape and have a clear vision of the end-destination they want to reach and what target operating model they want to develop. This means understanding the reality and the potential of new interactivity across a myriad of different interfaces – between the world of power utilities and technology, energy storage, distributed large- and small-scale renewable energy, electromobility, telecommunications, home and business appliances and energy management.

Target operating model design and implementation

We have experience throughout the utility value chain and understand the business challenges utilities face before, during and after smart meter and smart grid deployment. We can help design the operating model, lead the implementation and ensure that together we 'make change stick'.

Smart grid road map

Our global practitioners have experience in the smart meter and smart grid marketplace. We can build a future state road map that combines the current state with the optimal smart, corporate information systems and ERP solutions.

Investment and business case

We can help build business case models which represent the true capital project risks and issues, operating models, and regulatory / cost recovery scenarios using proven and robust methodologies and tools.

Strategy development checklist

What does your organisation and operating environment need to look like to be 'smart enabled'?

Which elements of your portfolio do you want / need to invest in?

Is there aligned and central coordination?

Do you have a rigorous business plan that can flex with the changing scenarios?

How are you planning to engage with customers?

What alliances do you need?

What are your roll-out options?

Do you understand your customers well enough?

What does success look like?

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Preparation

Smart grid and smart metering implementations are potentially highly complex in their own right and come layered on top of an already challenging capital investment, stakeholder and consumer environment. There are substantial risks to the success of smart grid programmes. Getting the foundations right through good preparation is key.

On the capital programme side, there is potential, like all capital projects, for timescales to slip and costs to get out of hand. Having effective programme control is all the more important given that the cost-effectiveness and programme delivery of smart grids is highly dependent on a multi-stakeholder landscape.

Effective preparation involves strong engagement and communications with stakeholders. For example, PwC climate change research is beginning to show that there is a great deal more complexity in getting consumers to act differently around climate change than was first thought. Simply providing the infrastructure may have very little impact on behaviour and energy consumption.

Programme management and programme assurance

Our capital projects services provides scheduling, PMO and dispute analysis services.

Business transformation

We can advise and help implement programmes to deliver the real and lasting business and organisational changes that need to happen if you are to maximise the opportunities presented by smart metering and smart grids.

Customer engagement

Design and implementation of customer outreach strategies to increase customer uptake of smart tariffs and home energy management tools.

IT systems upgrade

We can help with SAP and Oracle based system implementation.

Preparation checklist

Do your systems support the data and billing requirements?

How will you control such a complex programme?

What form of governance do you need and which stakeholders need to be involved?

Which partners will you work with?

Is your testing rigorous and analysable – do you understand the questions you are asking?

Do you have a staff engagement and education policy?

What propositions will you offer to customers?

How will you engage the media and prepare them?

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Roll-out

Delivering a smart grid programme on time and to budget is a vital part of any successful roll-out. For utility companies, the choice of partners, technologies, procurement and contracting strategy will all be key factors in dictating success or failure. For governments and regulators, the commercial design of the programme needs to maximise the potential for additional innovation while also ensuring that baseline objectives are met.

Smart metering and smart grid projects entail a range of specific risks in addition to those encountered in the roll-out of any large capital programme. For example, in smart metering there is the uncertainty about the ability of the technology to scale. In the wider development of smart grids, there are considerable planning and environmental hurdles to overcome.

PricewaterhouseCoopers brings a breadth of experience of large capital projects, deep utilities sector understanding, public sector programme management, public-private procurement, sustainability & climate change, management consulting, IT security, and regulatory economics to mitigate risk and advise you on the roll-out and delivery of smart grid programmes.

Delivering on target and to cost

Our capital projects services team is on hand to provide analysis of project change management processes and quantifies the impact of complex schedule and scope changes.

Supply chain selection and management

Identifying system and process limitations. Developing improvements across supply chain processes and technology.

Managing the hype

Managing expectations and keeping your feet on the grounds needs to be an important part of the roll-out of smart meter and smart grids. There is a real danger of some stakeholders overhyping the 'smart revolution' and others being ready to jump on any shortcomings.

Roll-out checklist

Do you have the data required to manage the roll out?

Do you understand the impact of the transition on your business?

How will you ensure that your deliverables arrive on time and to quality?

How many waves of installation will you need?

How will you transition customers to new products?

Who will manage your suppliers?

How will innovation be allowed to influence the programme?

What is your media relations strategy?

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The biggest factor in your success post-implementation will be what you do during implementation. Utilities need to understand the level of complexity they face goes far beyond just new meters and sensors. Companies have to be ready to capitalise on the real-time management of information that is capable of monitoring everything from power plants to customer preferences and appliances while balancing the supply and demand of electricity of existing and new generation.

Not only are there the new technology challenges but there are also important issues concerning cyber security, data protection and an evolving, and increasingly sophisticated, customer environment. This is truly a holistic change for the entire industry.

The biggest change will be the impact of the smart grid on the boundaries of the sector. Already, we are seeing multiple smart grid convergences such as automobile manufacturers with utility companies and networking companies with utilities. Smart grid infrastructure will be a composite of many industries and be built out through their interrelationship and convergence. Again, this brings us back to preparation – companies that capitalise most post-implementation will be those that identify their roles and opportunities early and have the right alliances in place from the start.

Capitalising on benefits

Benefit tracking tools to validate benefits are captured and business process changes are optimised.

Managing to target operating model

Project O&M assessment to confirm sustainable levels of system issues and FTE's to operate system to growth targets.

Delivering customer value

Design customer outreach process to maximise response to customer offerings and customer benefits of smart metering system.

Post-implementation checklist

How do you protect your customer base from competition?

What approaches will you take to help customer realise the benefit?

How will you realise the value of the knowledge you have gained?

Can you demonstrate that the programme has delivered the promised benefits?

How will you use all this rich new data?

Do you have the necessary security and data protection measures in place?

How will you maximise customer benefit?



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Case studies

Pacific Gas and Electric – smart metering implementation programme

Background

PricewaterhouseCoopers is involved in North America's largest smart metering roll out. Pacific Gas and Electric (PG&E) has already deployed 3.5 million gas and electric smart meters throughout Northern California and is tasked with delivering 10.2 million smart meters in a US\$2.2bn five year programme to 2012.

PwC holds a major consulting role on the project including participation in all executive steering committee discussions and contribution to eight distinct work streams, including key areas such as programme management office (PMO) process and controls design, business process design, and deployment of real-time cost and customer impact metrics. We highlight the PMO element of this work below.

The smart metering project required integrating multiple work streams and stakeholders through a strong, centralized project management body to manage programme scope, schedule and budget.

Our approach

PwC provided an integrated quality assurance and process design team which reviewed PMO processes and procedures across nine functions (organisational design, financial management, communications and reporting, supply chain, schedule management, issue and risk management, procurement and contract management, scope management, and systems and technology). The PwC team leveraged their understanding of the utility and smart meter project culture to design and implement PMO processes and control improvements that fitted with the needs of the project and the project team.

Deliverables and client benefits

The project demonstrated strong PMO capability to the utility regulator, and has been able to operate and manage scope, schedule and budget to meet project goals. The PwC team has operated with a collaborative focus and is able to make real time process change, necessary for the project considering the customer, utility and state implications of project issues.

Australian national smart metering programme

Background

Australia's National Smart Metering Programme is one of the major international programmes to roll-out smart meters to small customers. A range of distributor, retailer and consumer stakeholder interests come together in the National Stakeholder Steering Committee.

Our approach

PricewaterhouseCoopers was selected to provide programme management services based on our excellent reputation for managing complex reform programmes that require effective programme and stakeholder management with organisations that have strong competing interests.

Deliverables and client benefits

Five work streams are moving forward covering business requirements, business procedures, regulation, pilots and trials and NEM procedures testing framework. Key deliverables so far include a regulatory architecture for smart metering, a draft smart metering infrastructure minimum functional specification, draft changes to the National Electricity Rules, draft terms of reference for a cost recovery review by the Australian Energy Markets Commission, advice to the government on the impacts of smart meter services on the new National Energy Consumer Framework, and initial process maps for changes to NEM Procedures to support interactions between distributors and retailers.

The multi-stakeholder context is producing different views on who will control the provision of smart metering services, infrastructure performance levels (e.g. data communications), and whether the rollout of meters should be market driven by retailers rather than imposed by regulation through a distributor led rollout. A recent independent survey conducted by AEMO (the contracting body) of programme participants found that a complex programme was being well managed particularly in view of the strong tensions between distributors and retailers

Developing a corporate strategy for smart meter roll-out

Background

A German utility company with nearly 1.2 million meters launched an initiative to put smart meters in every household. The implementation was designed to fulfil regulatory requirements but, also, the company wanted to coincide it with the centralisation of all tasks related to metering and smart metering in the parent company.

Our approach

PricewaterhouseCoopers worked with the company to look at how smart metering could best be rolled out in the context of different customer needs in a liberalised market. We developed customer-specific business models for smart metering as well as defining the different organisational models that the company could develop for their implementation.

Alongside this, we supported the parent company in its discussions with subsidiaries with regard to the centralisation of tasks, as well as advising on the legal and technical implications of the existing regulatory requirements and the strategic options open to the company in fulfilling them.

Deliverables and client benefits

- Evaluation of the relevant market sectors, including forecasts of the impact of competition on supplier and customer numbers.
- Development of business models for combining the two market roles of energy supplier and smart meter operator.
- Assessment and evaluation of the technological options available to the company in terms of meter infrastructure, communication infrastructure and IT systems.
- Examination of the specific expected impact of a smart grid on electric mobility.
- Evaluation of customer demands for new technological solutions such as electric vehicle charging and smart home solutions and support for the development of products in response to these technological possibilities.

By providing a comprehensive approach, we contributed to the successful development of the company's smart metering strategy and helped create the framework for its successful implementation.

Checklist

- 1 Do you have a clear vision of your smart grid opportunities and how they will translate directly into real, tangible gains for you?
- 2 Is the regulatory framework optimised for smart grid development or is there a need for a different framework accommodating more appropriate commercial models?
- 3 On both the strategic and the regulatory fronts, have you conducted robust scenario planning and modelling to test the validity of your assumptions, planned course of action and return on investment?
- 4 Do you have a clear road map for your smart grid roll-out?
- 5 Have you identified the convergence alliances that you need to forge and have you got the right joint working arrangements in place to make the most of collaborative opportunities?
- 6 Have you got a programme in place to engage strongly and effectively with the many stakeholders involved?
- 7 Do you have effective and robust capital programme management and control mechanisms in place?
- 8 Have you got a smart grid transformation programme for your own organisation so that your own business is smart-enabled and ready to maximise the opportunities that a smart grid presents?
- 9 Are you confident that your customer relationship strategies will ensure that the customer experience is a positive one and not one that falls victim to smart grid hype?
- 10 Have you taken the steps to make your smart grid implementation cyber-data- and physically-secure?

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