


**STRATEGIC  
ADVISORY**

# Energy Regulation and Utility Management

*The electric utility industry is becoming more complex, competitive and challenging. In such a dynamic environment, our clients need support they can trust to help them evolve their business activities and manage risk as never before. The changing energy mix forces regulatory evolution and a need for utilities to realign business practices and approaches to address the challenge.*

*Recognizing that our clients have different needs at different stages, PSC provides a wide array of operational and advisory services across all phases of the changing grid and regulatory life cycles. Tailored to each client, we provide expertise in Energy Markets, Regulation, Asset Management and Strategic Planning. Our consultants have wide-ranging financial, commercial and technical expertise, and experience working with Regulators, Utilities, International Funding Agencies and Investors.*

## Overview

PSC helps solve real-world problems facing the electricity industry today by harnessing our global subject matter experts' deep domain knowledge and applying our hard-earned electricity experience to every one of our clients' projects around the world. Our seasoned consultants have devoted their careers to solving complex electrical energy-related challenges, and that's why our clients call on us; because we have unmatched experience and specialized skills to help them improve performance and create sustainable value for all their stakeholders.

## Key capabilities

- Development of Regulatory Controls
- Capital and Operational Expenditure Support
- Updating Grid Codes or Distribution Codes
- Technical, Operational and Planning Standards
- Due Diligence
- Asset Management
- Strategic Planning
- Regulatory Compliance Evaluation
- Compliance Auditing
- Private Wire / Independent Network Operation

## PSC projects

The sample projects below are representative of the breadth and depth of our services.

### **Development of Electricity Security Standards for a Net Zero-derived Network, NEOM, KSA**

PSC is in the process of developing the Electricity Transmission and Distribution Planning and Operational Standard for ENOWA in KSA. In line with the scope, PSC is delivering benchmarking, stakeholder engagement and solicitation with key stakeholders prior to developing the Standard in cooperation with ENOWA. The Standard will establish a framework for operational and intact planning within a leading-edge network topology that is 100% renewably derived.

### **Technical Due Diligence – OETC, Oman\***

PSC was engaged by State Grid International Development (SGID) to perform technical due diligence related to their subsequent 49% acquisition of Oman Electricity Transmission Company (OETC). Along with a general explanation of Oman's electricity sector, PSC identified areas of perceived technical risk and provided longer-term CAPEX and OPEX forecasts.

### **Reassessment of Net Book Value of iDNO Asset base, UK**

PSC are currently supporting an independent Distribution Network Operator to reassess the Net Book Value (NBV) of its asset base. The NBV could be potentially lower than is appropriate, which would impact the associated value of assets held by the company.

PSC is delivering a scope that will include:

- Developing the framework and methodology for valuation written in a format to provide 'assurance' and an associated audit mechanism for continued verification.
- An audit of associated valuation and report identifying confidence in the robustness of the figures so the iDNO may re-evaluate its balance sheet value.

### **Modified Distribution Code for Renewable Energy, KSA\***

PSC acted on behalf of the Distribution Code Review Panel and reviewed four proposed amendments to the Saudi Arabian Distribution Code that would allow the adoption of intermittent non-scheduled generation sources (i.e., renewable energy generators). The output of this assignment was a series of recommended changes to the Saudi Arabian Distribution Code to facilitate legislative guidance to the connection and operation of renewable energy sources in the Saudi Arabia Distribution Network.

### **Compliance Officer 5 OFTO's, UK**

PSC act as Regulatory Compliance Officer for 5 UK OFTOs. The Role, as approved by Ofgem includes verifying license compliance against key elements such as assurance of no cross-subsidy, adequate regulatory barriers between OFTOs, appropriate documentation to assure the Regulator of licence compliance and varying other mandated obligations.

### **Regulatory Investment Test for Power Transmission Projects, KSA\***

PSC developed a Regulatory Investment Test to ensure that any transmission project has adequate justification for CAPEX allocation. The test allowed a structured review of Pre Investment Appraisal Documentation and associated Grid Code considerations. The test is now actively implemented with WERA reviewing projects in line with the methodology.

### **Development of an Electricity Security Standard and Optimal Dispatch Verification Methodology, Bahrain**

PSC developed the Electricity Transmission and Distribution Planning and Operational Standard for the Electricity and Water Authority in Bahrain. In line with scope, PSC delivered benchmarking, stakeholder engagement and solicitation with key stakeholders prior to developing the standard in cooperation with EWA. Following the standard development, a series of institutional capacity-building programs were delivered. This culminated in a program of optimal dispatch verification against the standard-identified criteria to support EWA in enhancing OPEX savings.

### **Sheringham Shoal OFTO Grid Code Compliance, UK\***

PSC provided project management and technical advice associated with the design and installation of single-tuned 5th harmonic filters at Salle 132kV Substation - the point of connection of the Sheringham Shoal Offshore Wind Farm. The installation of harmonic filters was required to comply with the Grid Code and ER G5/4.

### **Regulatory Submission Audits, KSA\***

Performance of regulatory compliance audits on behalf of the Water and Electricity Regulatory Authority (WERA). The audits considered Generation, Desalination, Distribution, Transmission and Customer Service businesses for the licensed utilities. PSC was responsible for the auditing of multiple generation and transmission sites across the Kingdom. This involved interviewing on-site staff, inspecting generation equipment, reviewing important processes, and providing an assessment of the regulatory submission prior to acceptance or rejection.

### **Transmission Capability Statement and Investment Documents Review, KSA**

PSC has annually reviewed the Transmission Capability Statement produced by various Transmission Companies for compliance against the licence obligations. In keeping with Revenue Determination requirements, we have reviewed project investment material produced by the Transmission Company to justify the expected expenditure. PSC have reviewed several hundred capital projects in depth (equating to several billion dollars) in investment decisions to assess that:

- a) The investments were in line with license obligations.
- b) Projects were delivered efficiently and in line with identified parameters.

Following this process, PSC provided recommendations to the Regulator regarding the CAPEX allowance for the associated Transmission Utility for the Determination Period.

### **Regulatory Advice on DER Hosting, USA**

PSC reviewed the Distribution Resources Plan (DRP) documents issued by California utilities in response to the California Public Utilities Commission Governance Document. PSC reviewed the proposed methodologies from distribution utilities to calculate Distributed Energy Resource (DER) hosting capacity and locational benefits. The constraints on hosting capacity include thermal, voltage, power quality, protection, and safety. Locational benefits included localized voltage support and resilience to network outages.

### **Support During Regulatory Investigation, Oman\***

PSC was appointed by the customer to assist with regulatory governance requirements to ensure policy and process for network planning were in line with Oman regulatory requirements of the Regulatory Authority (APSR). PSC provided guidance and direction by reviewing and revising processes and procedure documentation used by the planning section of a DNO.

### **iDNO Independent Technical Expert, UK\***

PSC carried out the design and specification of a new private wire / iDNO network and district heating system to serve approximately 7,000 new residential apartments and mixed-use developments. We provided a strategic review of the network operator options available to the developers. The resulting

review allowed the developer to consider the options of being a licensed owner/network operator against the established ownership by the incumbent network operator.

#### **Ancillary Service Provision Support, UK\***

PSC provided support to a large generation and ancillary service provider on various projects to review the ways in which their generation fleet could participate in the various aspects of the ancillary service market in the UK. This included Black Start, enhanced reactive power provision and enhanced power oscillation damping provision.

As part of the works, PSC supported in the location of viable synchronous condensers points of connection on the UK network as part of the National Grid Stability Path Finder project.

#### **Transmission Security Standards Review, New Zealand**

PSC carried out a review of international best practices for the electricity regulator in New Zealand. This included a detailed analysis of equipment fault rates, and a power system contingency analysis based on the new security standards to ensure the recommended changes did not result in high levels of system constraint. Following the completion of the analysis, workshops were carried out with all interested parties to inform them of the changes to the Standards and the impact these changes had on them.

#### **Least Cost Generation Planning Criteria, KSA\***

PSC developed a new policy setting out of the requirements for 'least cost generation planning' including details on how to assess the technical and economic elements. The policy provides clear guidance on calculating generation margins and optimization of the investments on a regional basis to the Regulator.



#### **Renewable Connection Approaches Benchmark on Connection Polices, KSA\***

PSC provided a benchmark of international practices on the connection of renewable generation projects taking into account transmission Security Standards and configurations. The benchmarking considered the methodology of cost recovery with jurisdictions that applied both 'shallow' and 'deep' connection cost recovery.

#### **Review Transmission Planning Criteria, KSA\***

PSC reviewed and benchmarked the Transmission Planning Criteria used by the National Grid Company of Saudi Arabia for long-term planning. The work focused on development of a robust set of guidelines for long-term transmission planning in line with licence obligations.

#### **Underfrequency Load Shedding Policy Development, Nordics\***

PSC performed an ENTSO-E study for harmonization of under frequency load shedding policies for Norway, Sweden, Denmark and Finland. This considers the impact of high renewable penetration on heavily interconnected networks and emergency restoration mechanisms in keeping with legal obligation from licence holders.

*\*These projects are a sample of experience gained at Ramboll Energy UK Power Systems before the acquisition of the group by PSC.*



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