

# Renewable Energy Services

## Helping Our Clients Create Value from Renewable Energy Technologies and Businesses

### Navigant Consulting

Navigant Consulting is a specialized independent consulting firm providing professional services to assist clients in identifying practical solutions to the challenges of uncertainty, risk and distress. We focus on large industry sectors that are typically highly regulated and are undergoing significant change.

### About NCI Energy Services

Navigant Consulting is one of the leading management consulting firms concentrating on the energy and electric power industries. We have strong resources to provide our clients with exceptional depth and breadth of industry knowledge and experience. All of our work reflects extensive understanding of energy fundamentals: the regulatory process, pricing, supply and demand dynamics, market design, customer strategies, fuel sourcing, financing, and operations. Our clients count on us for our independent views, exceptionally deep understanding of the energy and financial markets, technology expertise, practical operations know-how, and broad business understanding.

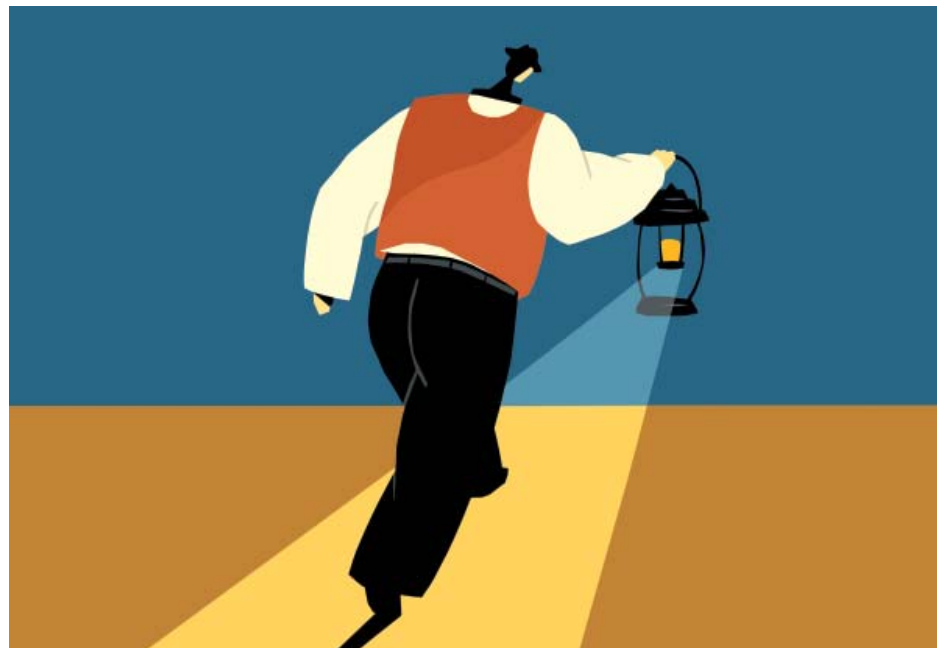
Renewable energy has had a remarkable run over the past decade. After years of being “just over the horizon,” the global renewable energy equipment market is valued today at over \$45 billion annually (excluding large hydro power). Such factors as performance improvements, cost reductions, rising oil/gas prices, environmental constraints, and government incentives have helped increase the competitiveness of renewable energy technologies versus traditional energy sources. Yet despite all the recent success, the renewable energy industry faces important challenges.

For more than 25 years, Navigant Consulting, Inc. (NCI) renewable energy experts have assisted corporations, investors, governments, and other energy industry stakeholders in meeting their near- and long-term objectives for renewable energy. As the industry has evolved and matured, so has the range of services that we provide. Today, we assist clients along the entire industry spectrum, and we are recognized for our leadership in this field.

## Navigant Consulting Can Assist You

We help our clients create value from renewable energy technologies and businesses by addressing their critical questions, such as:

- » What is the realistic outlook for renewable energy technologies, applications, markets, competitors, and government roles – and how can that benefit our organization?
- » What is the right strategy for entering the market, attracting investors or partners, or even exiting the business?
- » What approach should we take to build renewable energy resources into our energy mix?
- » How can we meet upcoming renewable energy standards or leverage renewable energy funds?
- » How can we approach project development to help ensure the success of our renewable energy project?
- » What are our best options for securing debt and/or equity for our project?
- » How can we make money in the renewable energy business?



## NCI Representative Clients

- » Abu Dhabi Government/MASDAR
- » Arizona Public Service
- » Austin Energy
- » BioPower Group
- » BP
- » California Department of Water Resources
- » California Energy Commission
- » Caterpillar
- » Clipper Wind
- » Chevron
- » Colorado Springs Utilities
- » ConocoPhillips
- » Credit Suisse
- » Edison Electric Institute
- » E.On
- » First Solar
- » General Electric
- » Hydro-Quebec
- » Lower Colorado River Authority
- » Madison Dearborn
- » Massachusetts Renewable Energy Trust
- » Mitsubishi Heavy Industries
- » Morgan Stanley
- » National Renewable Energy Laboratory
- » New York State Energy Research and Development Authority
- » Ontario Power Generation
- » Philips Lighting
- » Puget Sound Energy
- » Salt River Project
- » Shell Renewables
- » Schott Glas
- » Southern Company Services
- » State Street Bank
- » Texas Instruments
- » TXU
- » U.K. Carbon Trust
- » U.K. Department of Trade & Industry
- » U.S. Department of Energy
- » U.S. Environmental Protection Agency
- » U.S. Navy
- » Virgin Fuels
- » We Energies

## NCI Renewable Energy Services

NCI is a leader in providing renewable energy management, technology, and operations assistance to a diverse set of private and public-sector clients. Examples of our assistance include:

### Resource, Technology, Market Assessment and Power Procurement

- » Technology cost, and performance assessment
- » Analysis of Renewable Energy Certificate markets and forward prices
- » Integration of renewables into Integrated Resource Plans
- » Request for proposal (RFP) development/bid evaluations
- » Negotiating power purchase and sales agreements

### Strategy Development and Investment Planning

- » Market forecasts and opportunity assessment
- » Strategic planning, visioning, and competitive positioning
- » Business model development
- » Risk analysis and mitigation plans
- » Technical and financial due diligence for target acquisitions

### Project Development and Implementation

- » Resource characterization and assessment
- » Project feasibility analysis and risk management
- » Siting and environmental permitting
- » Project financing and closing
- » Construction services – independent owner's engineer

### Policy Development

- » New policy impact analysis
- » Facilitation of public/private partnerships
- » Program development and management assistance

## Examples – How We Assist Clients

### Resource, Technology, and Market Assessment

#### Photovoltaic Channels to Market and Expected Market Growth

For a large European based electrical company, NCI evaluated the channels to market of photovoltaics in the residential sector. Our team identified the market growth and business opportunities, as well as the distribution channels to market for new and retrofit applications. Builders, contractors and developers were interviewed to gain their insights about product delivery today and the trends expected through 2010.

#### Arizona Public Service – Renewable Energy Procurement Bids Evaluation

NCI assisted Arizona Public Service in its evaluation of bids received in response to a 100 MW renewable energy procurement solicitation, which included proposals representing a range of technologies, sites, project sizes, and ownership options. Our team participated in commercial and technical meetings; reviewed valuation metrics; and developed commercially reasonable contractual terms and milestone schedules. We also provided the client with an independent commercial and technical analysis of a proposed contract to procure energy from a privately developed wind project.

#### CSP Technology Assessment

For a major energy player, NCI conducted a technical and economic assessment of parabolic trough, dish stirling, and power tower concentrating solar power technologies. NCI outlined the major players in CSP and compared the pros and cons of each technology. NCI also developed system costs and projections for each technology and compared them on a leveled cost of energy basis through 2015.



### **Austin Energy**

NCI has been working with Austin Energy in support of its target to achieve 20% renewable energy by 2020 (which includes 100 MW of solar). Our team worked with the senior leadership of Austin Energy to determine the technology mix, risk tolerance, timing, and strategy for meeting their renewable energy targets. NCI assessed the pros and cons of buying of renewable energy certificates, owning the power generation, having a developer own the renewable energy power generation, and other creative ownership options. As a follow-on to this work, NCI provided a review of different biomass power options for Austin Energy, including direct combustion, gasification, and pyrolysis.

### **Strategy Development and Investment Planning**

#### **Renewable Energy Strategy Support to Southern Company**

NCI was retained to review renewable energy strategy options for Southern Company, a major U.S. utility company. On behalf of the client, our team provided high-level review of all renewable energy options; reviewed market growth for key technologies; assessed geographic market growth opportunities, as well as barriers and drivers for each market segment; profiled key players; and provided business recommendations. As a result, Southern Company has decided to enter the renewable energy business and is actively assessing opportunities.

#### **Chevron – Defining a Portfolio of Promising Investment Opportunities**

Chevron asked NCI to assist in selecting a portfolio of medium term profitable investment opportunities in the emerging energy space. Our team reviewed the renewable energy, hydrogen economy, and energy storage opportunities, risks, potential profitability, and competitive situation of different busi-

nesses across the value chain. Over 100 potential investment opportunities were identified and characterized – assessing the fit and potential value (using Monte Carlo simulation of potential NPV, profits, and revenues).

#### **Private European Investment Firm – Industry Analysis and Investment Opportunities in Wind**

NCI was retained by a private foreign investment firm to provide a market overview of the global wind industry, analyze the sectors in the industry value chain, and identify investments in wind that were a good fit for the firm's investment profile. NCI evaluated eight different sectors along the value chain, looking at total revenue, profitability, and the risk profile. The client has recently committed to a several fold increase in their investment and participation in the wind industry.

#### **Project Development and M&A**

##### **Fatal Flaw Analysis of a Proposed Biodiesel Plant**

For a major investment bank, NCI staff conducted a fatal flaw analysis of a proposed biodiesel plant that was looking for funding. NCI staff reviewed capital and operating cost assumptions, plant performance, yield estimates, and other assumptions. Based on NCI's assessment, the client decided not to pursue the opportunity.

##### **Concentrating Solar Power Acquisition Due Diligence Support**

For a major investor group, NCI conducted a due diligence of a concentrating solar technology. Our team reviewed the current technology status as well as potential near term milestones needed to achieve close to grid cost parity. NCI performed a review of the policy framework, market environment, competitive landscape and proposed plant economics. Our staff met with the management team and discussed potential fatal flaws or risks associated with the potential

investment. Concentrator devises, tracking systems, and other balance of system costs were evaluated and compared to key technologies and players in the marketplace.

#### **Due Diligence to Support a Solar Company Acquisition**

For a major public industrial corporation, NCI was retained to provide solar industry knowledge and insight, business plan due diligence, and a pricing analysis in support of an investment for the acquisition of a major solar energy company. NCI's work included an analysis of the company's current revenue streams, competitive position, earnings projections, as well as a detailed pricing analysis for acquisition purposes. The company successfully completed the acquisition.

#### **Crédit Agricole Indosuez – Wind Energy Development**

NCI performed a comprehensive review of several aspects of Eléctrica del Valle de México's (EVM)/EDF Energies Nouvelles' La Ventosa wind project in Mexico. Our work included the analysis of time-of-day aspects of wind power to model revenue and creation of price-hedging mechanisms; evaluation of transmission charges and constraints, and independent due diligence of the Crédit Agricole's financing model.

#### **Landfill Gas Project Owner – Evaluating Options for Power Sales**

NCI was retained by the owner/operator of a landfill gas facility to evaluate options for power sales. This work included a review of current regulatory policy for power sales to alternative customers, transmission interconnection issues associated with energy delivery, and an overview of potential alternative power purchasers.

#### **Biogas Investment Due Diligence**

For a private equity client contemplating an investment in biogas (anaerobic digestion) power generation facilities in Germany, NCI performed a detailed due diligence of

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### Who Chooses Navigant Consulting for Renewable Energy Assistance?

Selected examples:

- » **Utility companies** – for evaluating, proposing, financing, developing, or implementing renewable energy projects
- » **Financial investors** – in need of long-term market and technology forecasts, partnering assistance, or regulatory updates
- » **Technology manufacturers** – to determine market opportunities and risks in developing renewable energy, and to understand the global competition
- » **Corporations, including oil majors and energy companies** – for assistance in building, driving, and implementing renewable energy strategies and business plans
- » **Government agencies** – to understand the potential impact of incentives on renewables implementation, to evaluate technologies, or optimize program portfolios
- » **State energy authorities** – to analyze, develop, and implement programs to drive renewable energy development and use
- » **Renewable developers and Indian Tribes** – to provide support for feasibility, technical, permitting, interconnection and financing efforts associated with renewable energy development



the policy framework, the market environment, the competitive landscape and the proposed plant economics. The latter included a review of the proposed technology and an assessment of the economic performance of each biogas fueled facility.

### Policy Development

#### California Energy Commission (CEC) – Recommendations for a Bioenergy Action Plan

For the CEC and the multi-agency Bio-Energy Interagency Working Group, NCI completed a project to develop detailed recommendations for the development of a bioenergy action plan for the state of California. NCI staff reviewed existing reports, interviewed key government staff and participated in a widely attended public workshop. Subsequent to NCI's report, the Governor released a statewide action plan, which set ambitious state targets for biofuels and bio-power production and consumption and directed state agencies to begin implementing actions to further the use of bioenergy in the state. NCI's report to the CEC served as the foundation document for this initiative.

#### U.K. Carbon Trust – Business Incubator Support for Low Carbon Technologies

The Low Carbon Innovation Programme's Foundation Programme supports the overall objectives of the U.K. Carbon Trust by stimulating the development and deployment of new and existing technologies that have the potential to positively impact levels of carbon emissions. NCI helped both organizations establish a framework for the development of low carbon technology incubation in the United Kingdom by reviewing best practice examples and experience

with several low carbon technologies such as bacteria for biofuels production, organic polymer photovoltaics, dye sensitized solar cells, and innovative building designs.

#### Arizona Solar Electric Roadmap

The Arizona Department of Commerce was interested in accelerating solar energy deployment in Arizona. NCI conducted an analysis of various solar options through 2020 and estimated the likely market potential and penetration for central applications as well as distributed solar on residential and commercial buildings. The NCI team compared the economics of solar options to other renewables as well as conventional power options. Our team then developed a solar energy roadmap that identified policies and other initiatives to help overcome existing barriers to accelerated development of solar.

#### Solar Rooftop Program for Abu Dhabi

For the government of Abu Dhabi and MASDAR, NCI helped to review options for a solar rooftop program. NCI assessed the lessons learned from Japan, Germany, Spain, California, New Jersey, Arizona, Greece, and Italy. In addition, our team interviewed key stakeholders in Abu Dhabi to better understand the local challenges that would need to be overcome in designing a successful program. Our team developed the policy framework and program structure for a solar program that discusses administrative costs, evaluation metrics, and optimal design features, and takes into account stakeholder needs and lessons learned from other solar programs. The goal of the program is to stimulate deployment of photovoltaics (PV) and support economic development along the solar value chain.