NexantECA

Technology and Costs

Biorenewable Insights: Renewable Power

Renewable Power is one in a series of reports published as part of NexantECA's 2020 Biorenewable Insights program.

Overview

Large scale renewable power is now a reality in many places across the world but engagement by stakeholders in the process industries remains limited. As the sector continues to develop, stakeholders will need to engage with renewable power using proven methodologies and assessment methods and be well-versed in available technology.

This report is a comprehensive review of renewable electricity sources for both dispatchable (front-of-the-meter or FTM) and non-dispatchable (behind-the-meter or BTM) commercial and industrial users, and of key metrics and methodologies for technology selection. It aims to provide a toolbox both for industry players to select and integrate renewable power technologies and to better understand the role of renewable power in the electric grid.

Technologies

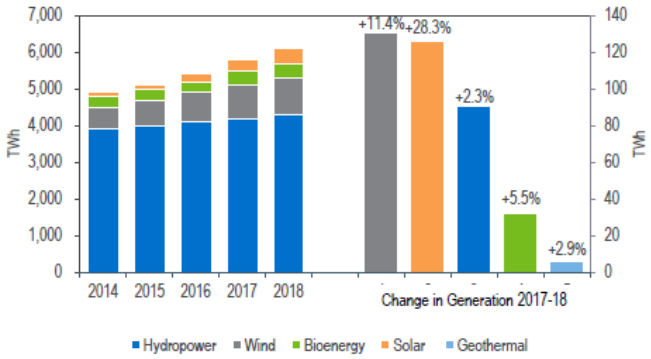
This report focuses on solar photovoltaic (PV) and wind power, and options for integration with battery energy storage systems (BESS). Coverage is centered on large-scale, commercially viable installations rather than on small-scale retrofits or adjunct power production facilities to maximize relevance for potential investors or industry players interested in participating in the deep decarbonizing of the global energy system.

Other technologies covered at a high level include solar thermal, biomass to electricity, hydroelectric generation, geothermal, and other sources.

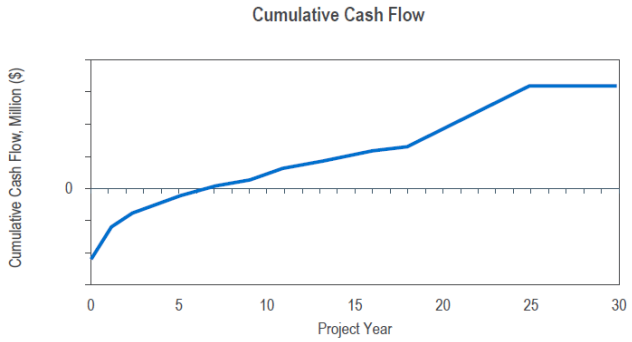
Process Economics

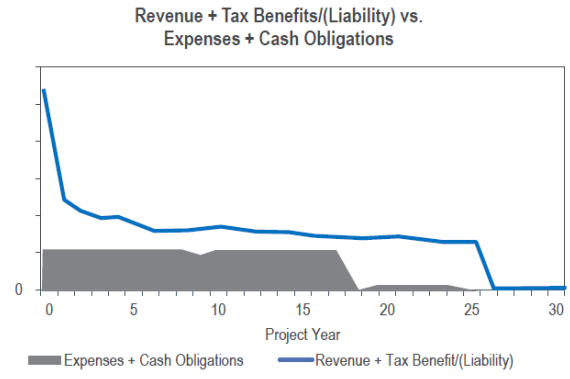
Comparative process economics are provided for major solar PV and wind technologies, along with both options integrated with BESS. Comparative economics for geothermal, biomass anaerobic digestion and hydrogen fuel cells are also presented for illustrative purposes. The report also includes detailed case studies of biomass power generation assets and CSP integrated with thermal energy storage using NexantECA's prior industry due diligence experience.

Global Annual Renewable Power Growth



Solar PV Cumulative Cash Flow and Revenue vs Expenses Profile





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The BI program (sister program to the world renowned TECH program, formerly known as PERP) is globally recognized as the industry standard source of process evaluations of existing, new and emerging of interest to the renewable energy and chemical industries.

BI's comprehensive studies include detailed technology analyses, process economics, as well as capacity analysis and impacts on conventional industry. Reports typically cover:

- Trends in technology
- Strategic/business overviews and/or developer profiles
- Process Technology:
- Chemistry
- Process flow diagrams and descriptions of established/conventional, new and emerging processes
- Process economics – comparative costs of production estimates for different technologies across various geographic regions
- Capacity tables of plants and analysis of announced capacities
- Regulatory and environmental issues where relevant

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- Cost of production tables in spreadsheet format (as requested)
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Technology and Costs comprises the Technoeconomics – Energy & Chemicals (TECH) program (formerly known as PERP), the Biorenewable Insights program (BI), the Sector Technology Analysis, and the new Cost Curve Analysis. These programs provide comparative economics of different process routes and technologies in various geographic regions.

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