CAPABILITY STATEMENT

Renewable Energy Resource Assessment

Earth Systems has a high level of experience and expertise in renewable energy resource mapping and assessment at the local or national level. We have the capability to assess the technical and commercial potential for a region to generate electricity and heat from local renewable sources such as wind, solar, hydropower, wave and tidal, geothermal and biomass. Preliminary through to detailed economic and technical analysis and resource maps can be provided to identify your specific opportunities.

Forms of commercial renewable energy currently used around the world include solar power, wind power, hydroelectricity, bioenergy, geothermal energy, and tidal energy. All of these use technology to generate electricity by harnessing natural renewable sources of energy from the earth, sun, atmosphere or biomass resources.

A local renewable energy resource assessment provides detailed information about the potential for generation of electricity and potentially thermal energy from renewable sources either to service specific local demand points or to feed into the electricity grid. This comprehensive assessment includes spatial mapping to identify and inform relevant renewable resource analysis and to assess the generation potential. The economic feasibility of all potential renewable energy options is assessed.

RESOURCE ANALYSIS

Key inputs for renewable energy resource analysis include: electricity grid infrastructure and capacity for embedded generation, identification of major point source energy consumption, current land uses and impacts on generation opportunities, natural resource availability specific to each renewable energy technology (e.g. solar insolation, wind speed, geothermal, water, sustainable biomass potential), and key financial data per selected renewable technology. Engagement with the local community is essential to identify other factors that may impact on renewable energy generation.

Geospatial mapping (GIS) is used to identify areas where electricity generation potential is highest for the various resources. GIS mapping also informs the technology deployment process based on current land allocations and other criteria such as electricity grid infrastructure and distribution of electricity demand.

Analysis of the available resources together with technology capability provides a means of estimating the electricity generation potential for various sites within a region. Current and projected costs of various renewable energy technologies are then used to give a preliminary estimate of the economic feasibility of various renewable energy options. In particular, biomass resources are assessed in detail as bioenergy opportunities have the potential to also provide thermal heating and cooling.

Overall a renewable energy assessment will provide important information about the potential for local electricity generation from renewable sources, a detailed description and assessment of relevant technologies and recommendations about the most suitable avenues to pursue in moving towards a sustainable energy future.

KEY BENEFITS AND OUTCOMES

- GIS mapping and analysis of potential for renewable electricity and thermal energy generation from a range of resources including:
  » solar photovoltaic and concentrated solar thermal
  » hydropower, wave and tidal energy
  » wind
  » geothermal
  » and bioenergy (including thermal energy assessment)
- Inclusion of best available meteorological information to provide most accurate resource assessment.
- Grid analysis that identifies capacity for grid connection and major point loads within the region.
- Commercial feasibility for various forms of renewable technologies including calculations of the Levelised Cost of Energy (LCOE) based on discounted cash flow analysis.
- Recommendations on the most suitable options for renewable energy generation in a particular region. Short term immediate opportunities are identified, and a pathway forward for the development of longer term opportunities is suggested.
- Recommendations are presented with key financial and technical metrics. The outputs can be used to attract financial support for projects where appropriate.