A contribution to

An analysis of medium to long-term impacts on the Australian Oceans

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1.1 Renewable energy

Land based renewable energy technologies like solar and wind are mature. However, ocean renewable energy technology, such as wave and tidal energy, are still under development. In Australia, the Australian Renewable Energy Agency (ARENA) was established in 2012, and with support for some of the State Governments, development and research have significantly accelerated since. Nevertheless, to our knowledge, no projection of ocean renewable energy for Australia is currently available. As a result, in this section we focus on global projections.

The Institute for Sustainable Futures (ISF) has developed global projections based on three scenarios (Teske et al., 2016). The Reference Scenario (REF) assumes the continuation of policies in place. The Renewable Scenario (RE) focuses on renewable energy in the power sector by 2030. It is designed to reduce the carbon dioxide levels of emission by 50% by 2035 and 70% by 2050 compared to the levels in 1990. The Advanced Renewable Scenario (ADV) involves a fully renewable energy system (including transports) by 2050.

The model used, PlaNet, balances energy supply and demand annually and includes a cost calculation model for the corresponding generation and fuel costs.

The projections assume policy stability, strengthen energy policies, population growth based on the Australian Bureau of Statistics assessment, and average GDP growth of 2% per year. Cost assumption are the same in all projections. They are chosen as conservative, since the decrease in renewable energy cost expected are balanced by the increase in fossil energy costs, in the renewable energy scenarios. Global electricity generation projections for renewable energy and some of its components are presented in Figure 1. The electricity generation will increase significantly in both renewable energy scenarios. The part taken by ocean energy remains small but not negligible compared to other sources of renewable energy.

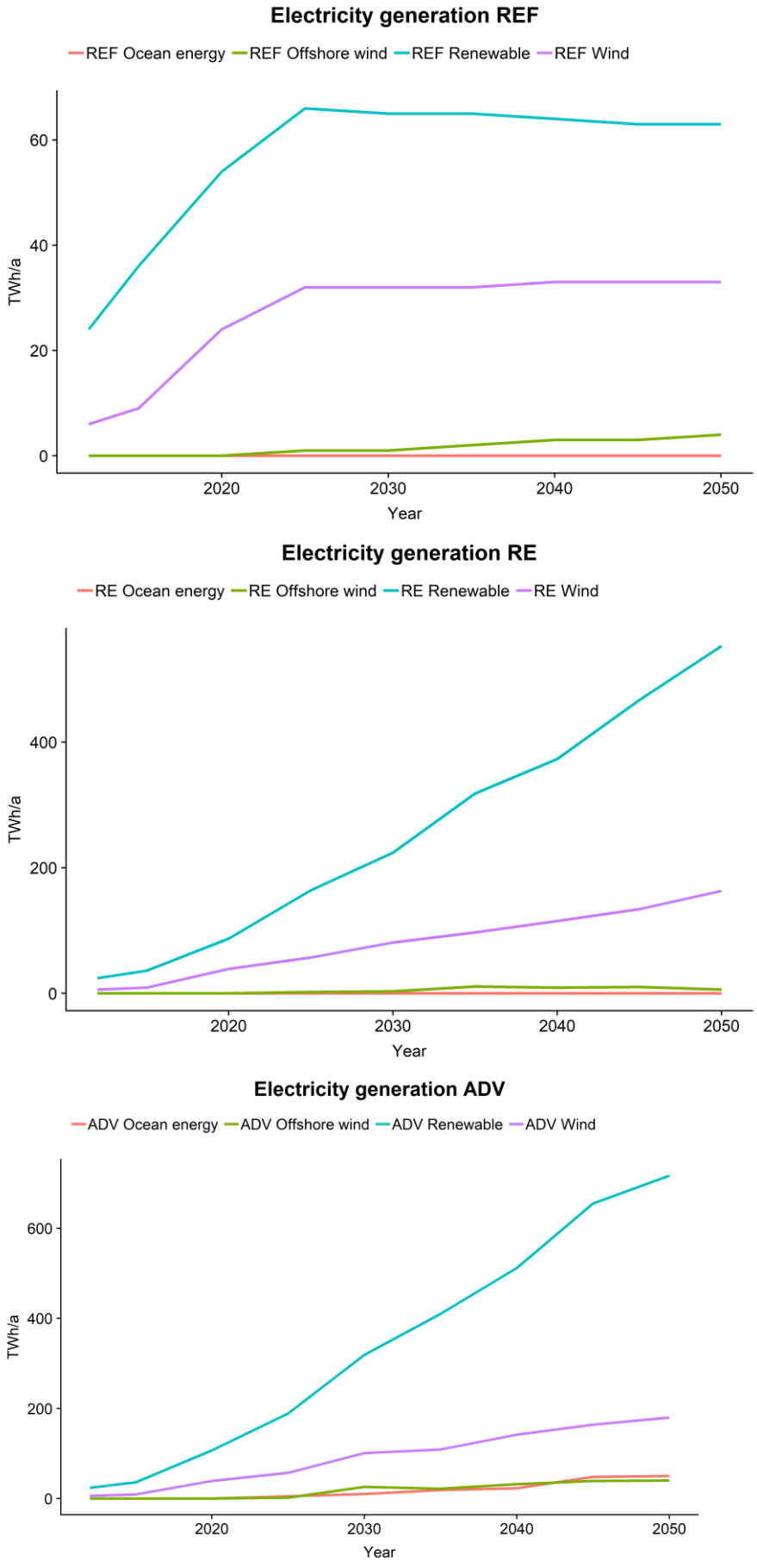

Figure 1. Electricity generation projections.

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