Methodology

Energy Sector research

October 2021

Energy Sector

Methodology and approach

Two primary use cases for digital tech interventions in the power and energy sector were analysed, both of which are underpinned by IoT sensors and connectivity.

- ***Connected solar grids***. Connected power grids to manage and distribute solar energy. Grids are equipped with IoT sensors that, in turn, connect to a mobile network, cloud and/or end user premises (residential or commercial) through cellular or non-cellular protocols
- ***Connected wind grids***. Connected power grids to manage and distribute wind energy. Grids are equipped with IoT sensors that, in turn, connect to a mobile network, cloud and/or end user premises (residential or commercial) through cellular or non-cellular protocols

There was a three step process:

1. Forecasts were used from Exponential Roadmap[1] to determine the aggregate amount of CO_2 savings a given industry will need to make over the next 10 years to ensure it remains on track for net zero by 2050. For all sectors, this reduction is equivalent to 50% of 2020 CO_2 emissions

2. For both use cases – connected solar and wind grids – estimations were made for the share of the renewable energy grids that are IoT connected at present and over the next 30 years to 2050, drawing on our proprietary IoT forecasts and publicly available research. This translates into an overall level of avoided CO_2 emissions through the substitution with fossil fuels that would otherwise emit carbon into the atmosphere

3. The use case savings over a 10 year period are divided into the aggregate sector reduction (from step 1) to arrive at a contribution share (e.g. connected solar grids can account for 33% of the emission reductions required in the power sector over the next 10 years)

Research by – GSMA Intelligence and Carbon Trust

[1] J. Falk, O. Gaffney, et al. Exponential Roadmap. 1.5.1 (2020) www.exponentialroadmap.org

Key assumptions

Use case	Indicator	Trajectory	Supporting data/sources
Connected grid - solar	PV capacity growth	Annual net increase in solar PV capacity in 2020 applied for remainder of forecast period to 2030 at regional level	International Energy Agency (IEA)
Connected grid - solar	% of solar grid connected with IoT sensors	35% in 2020, rising to 75% in 2050 in straight line fashion	IEA, GSMA Intelligence
Connected grid - solar	Electricity emission factors (EEFs)	2019 base year EEFs calculated at regional level. Forward projections to 2030 for each region based on growth rate of UK EEF forecasts from UK Department of Business, Energy and Industrial Strategy (BEIS)	Carbonfootprint.com; IEA; UK BEIS
Connected grid - wind	Wind capacity growth	Wind capacity growth calculated by Global Wind Energy Council (GWEC) for 2019 and 2020. Assume annual growth of 4.5% from 2020-25 before reducing to 2% from 2025-50	GWEC
Connected grid - wind	% of wind grid connected with IoT sensors	10% in 2020, rising to 75% in 2050 in straight line fashion	GWEC, GSMA Intelligence
Connected grid - wind	Electricity emission factors (EEFs)	2019 base year EEFs calculated at regional level. Forward projections to 2030 for each region based on growth rate of UK EEF forecasts from UK Department of Business, Energy and Industrial Strategy (BEIS)	Carbonfootprint.com; IEA; UK BEIS

Source: GSMA Intelligence & Carbon Trust

GSMA HEAD OFFICE
Floor 2
The Walbrook Building
25 Walbrook
London
EC4N 8AF
United Kingdom
www.gsma.com