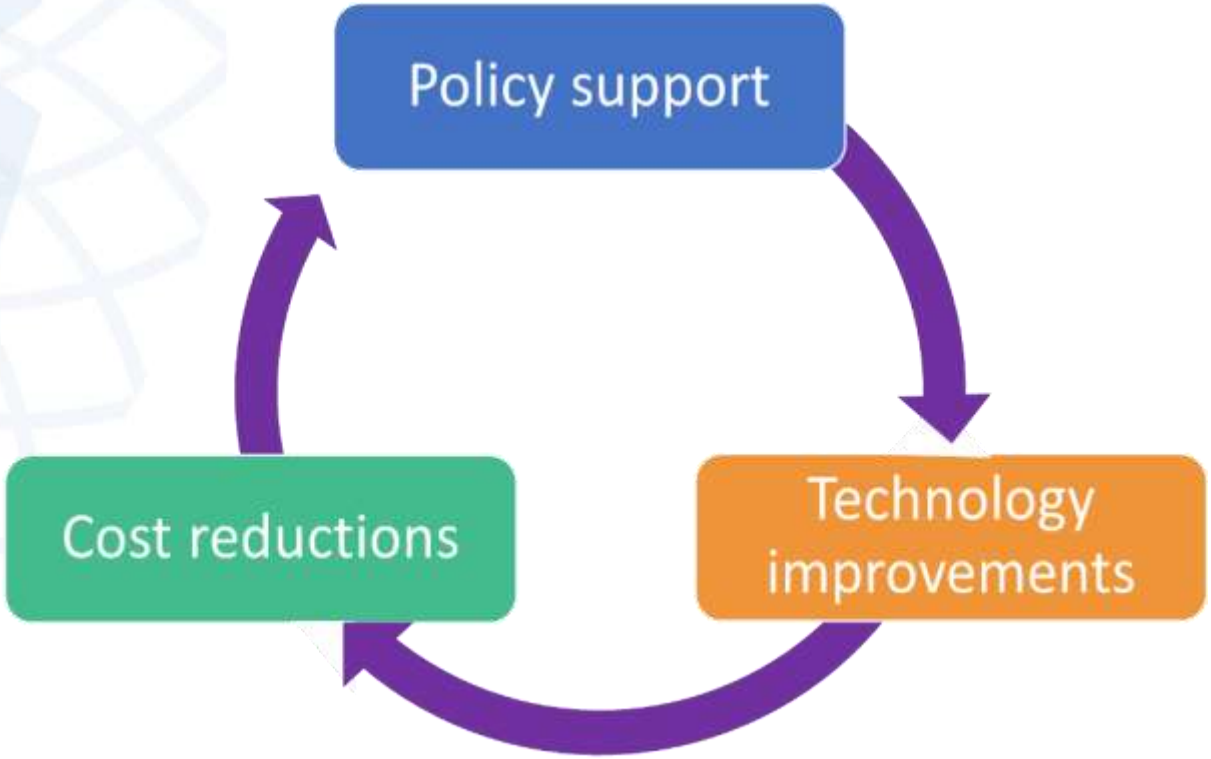
BATTERY STORAGE

ACCELERATING THE ENERGY TRANSITION

MICHAEL TAYLOR

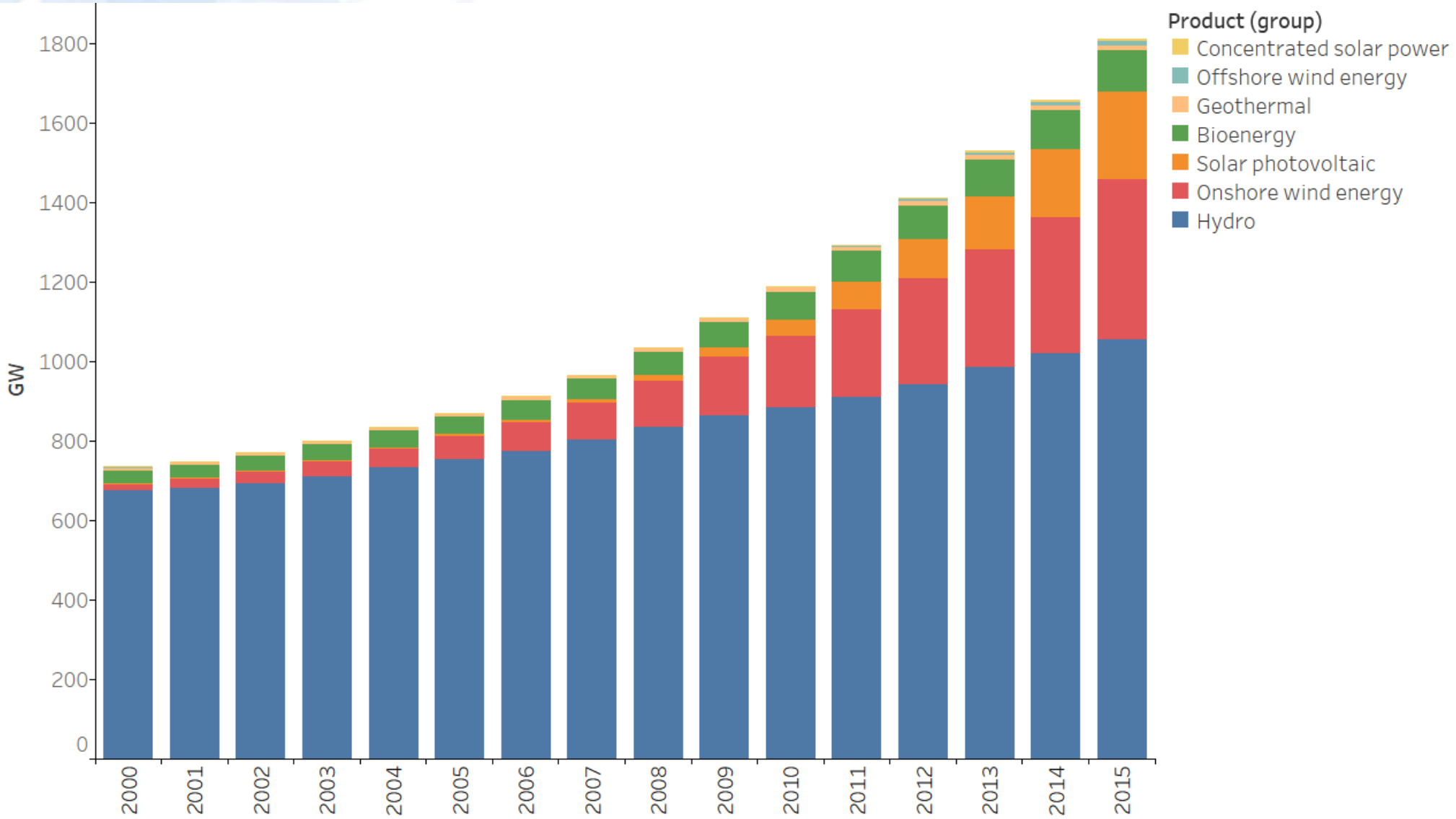
MTAYLOR@IRENA.ORG
15 MARCH 2017

The Energy Sector is Being Transformed

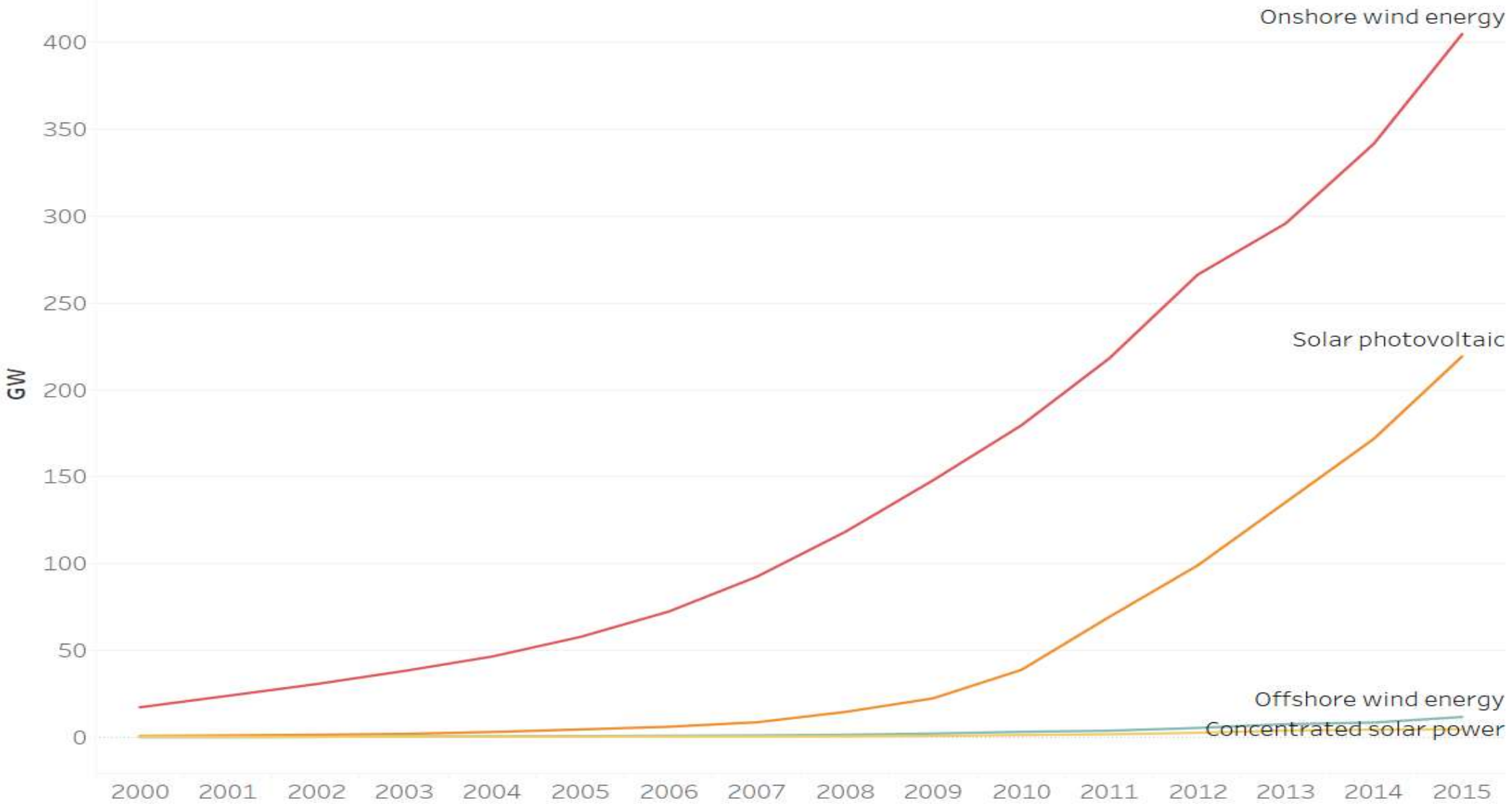


A ***virtuous cycle*** is unlocking the ***economic***, ***social*** and ***environmental*** benefits of renewables

Latest RE capacity deployment



Latest RE capacity deployment



Storage

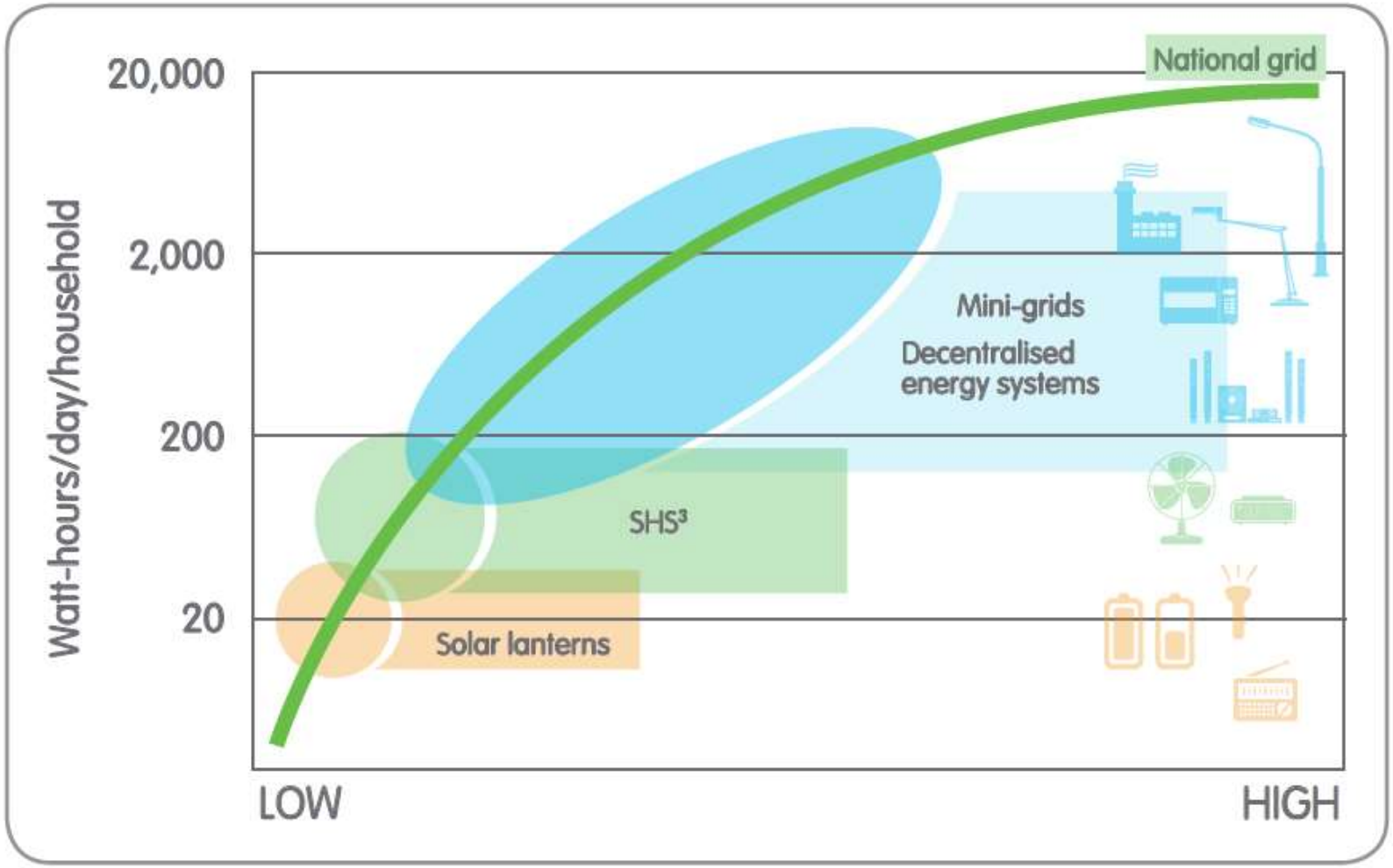
The importance of battery storage and roles

- Battery storage important part of transition now(e.g. SHS, islands, frequency response and EVs)
- Long term (integrating v high share of VRE)
- In the next 3-5 years, the storage industry is positioned to scale and echo the stark growth seen in the solar PV industry.
- Incremental improvements in energy storage technologies, developments in regional regulatory and market drivers, and emerging business models are poised to make energy storage a growing and viable part of the electricity grid
- In the stationary sector, increased economic applications due to cost declines are expected for grid services as well as increased RE penetration on islands/mini-grids and off-grid

SOLAR PV IN AFRICA: COSTS AND MARKETS

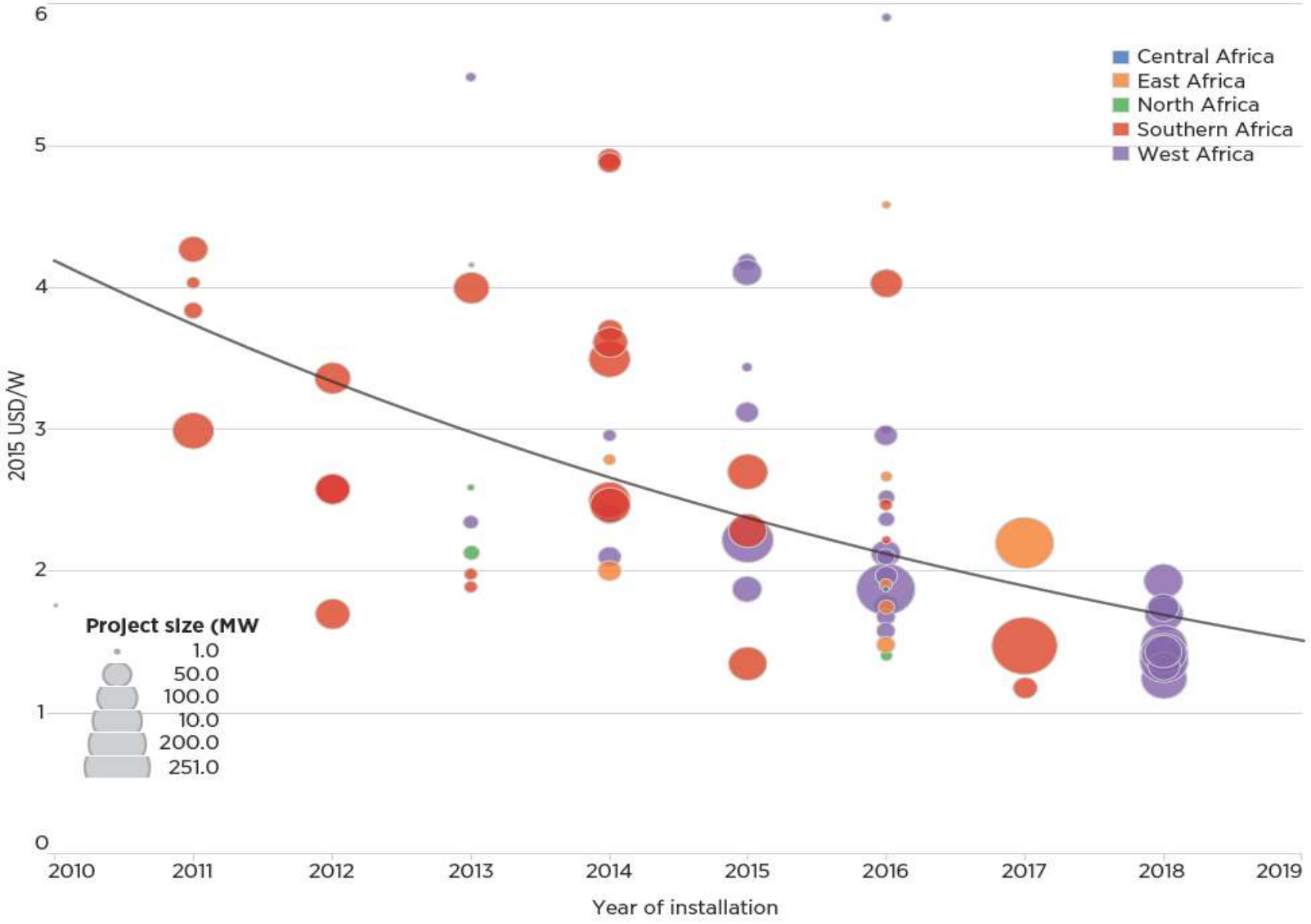
NEW OPPORTUNITIES UNLOCKED

Electrification stages using solar PV



source: GIZ, 2015

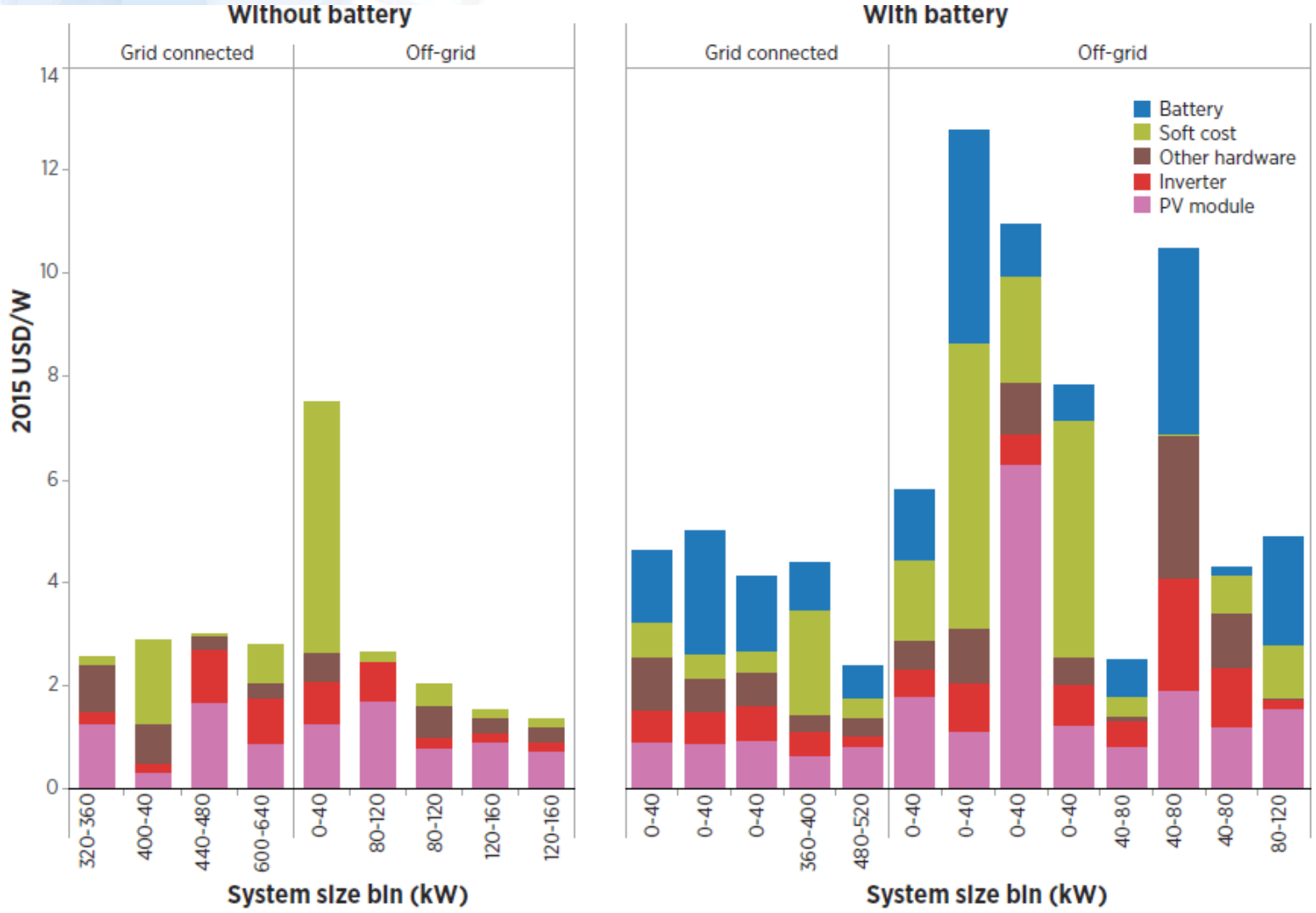
Solar PV costs in Africa



Source: IRENA Renewable Cost Database, 2016

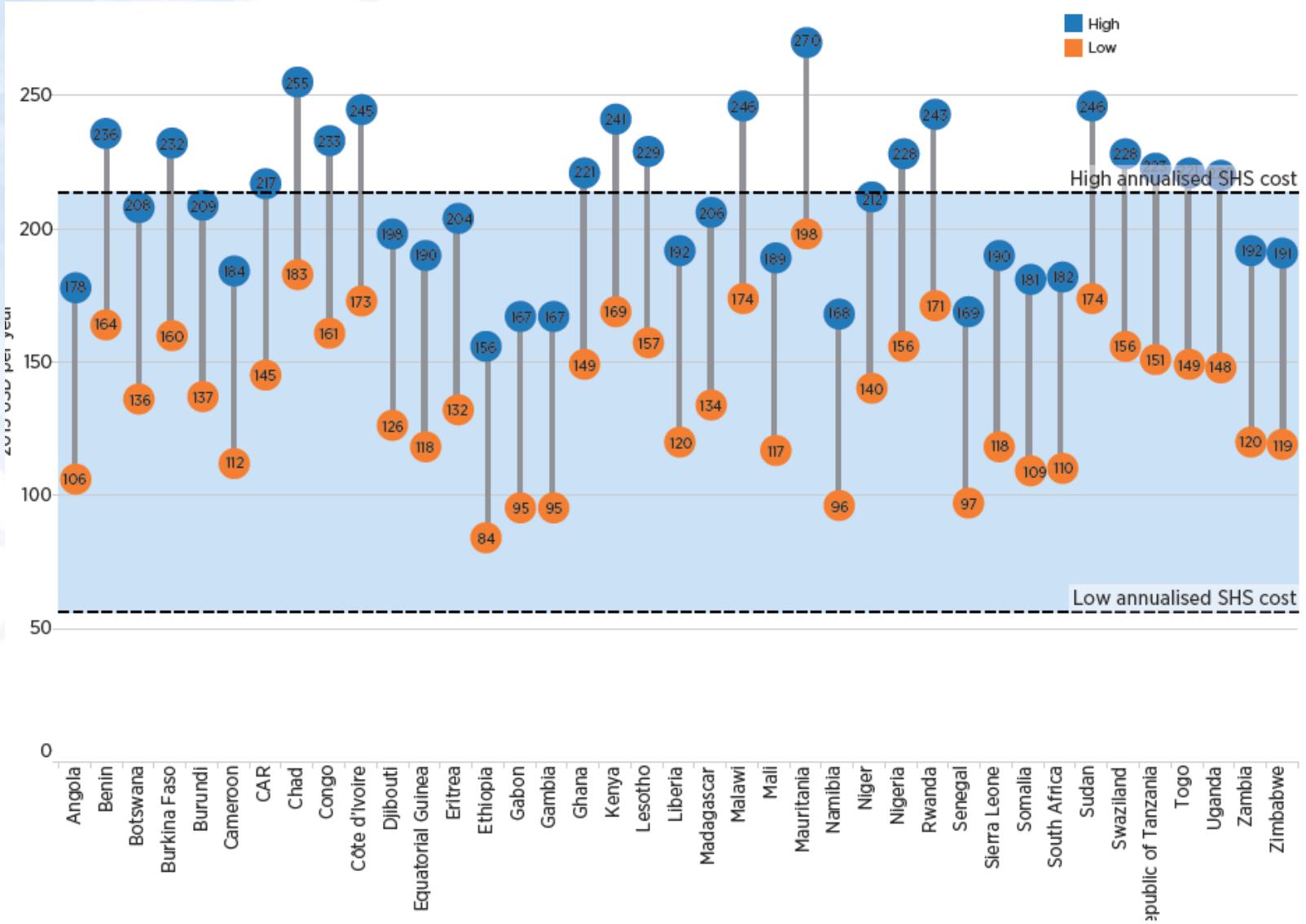
Operating and proposed utility scale solar PV project installed costs in Africa, 2010-2018 (IRENA)

Solar PV costs in Africa



Note: All system sizes have been rounded.

Solar PV costs in Africa



Operating and proposed utility scale solar PV project installed costs in Africa, 2010-2018 (IRENA)

Tokelau

Generation technologies

- Solar PV
- (bio-)Diesel backup

Storage technologies

- OPzS Lead-acid batt.

Turtle Island Resort, Fiji

- **Hotel size**: 14 cottages
- **RET**: Off-grid solar PV system with 240 kW of capacity and battery storage
- **Capital cost**: US$ 1.5 million
- **Payback time**: 6 years
- **Savings from avoided diesel cost**: US$ 250,000/year

IRENA
International Renewable Energy Agency

REmap
A Renewable Energy Roadmap

IRENA
International Renewable Energy Agency

#REmap

The energy transition

- **Doubling the share of renewable energy by 2030 is critical** for the achievement of sustainable energy and climate change objectives
- Doubling renewables in the world's energy mix by 2030 will lead to **savings exceeding costs up to 15 times**
- The transition to renewables, with greater energy efficiency, can **limit the global temperature increase to 2 degrees or below**

Keeping on track

Doubling renewables is critical for meeting climate objectives

Limit average global temperature rise to **2 °C** or below (when coupled with energy efficiency)

Avoid up to **12 gigatonnes** of energy-related CO_2 emissions in 2030

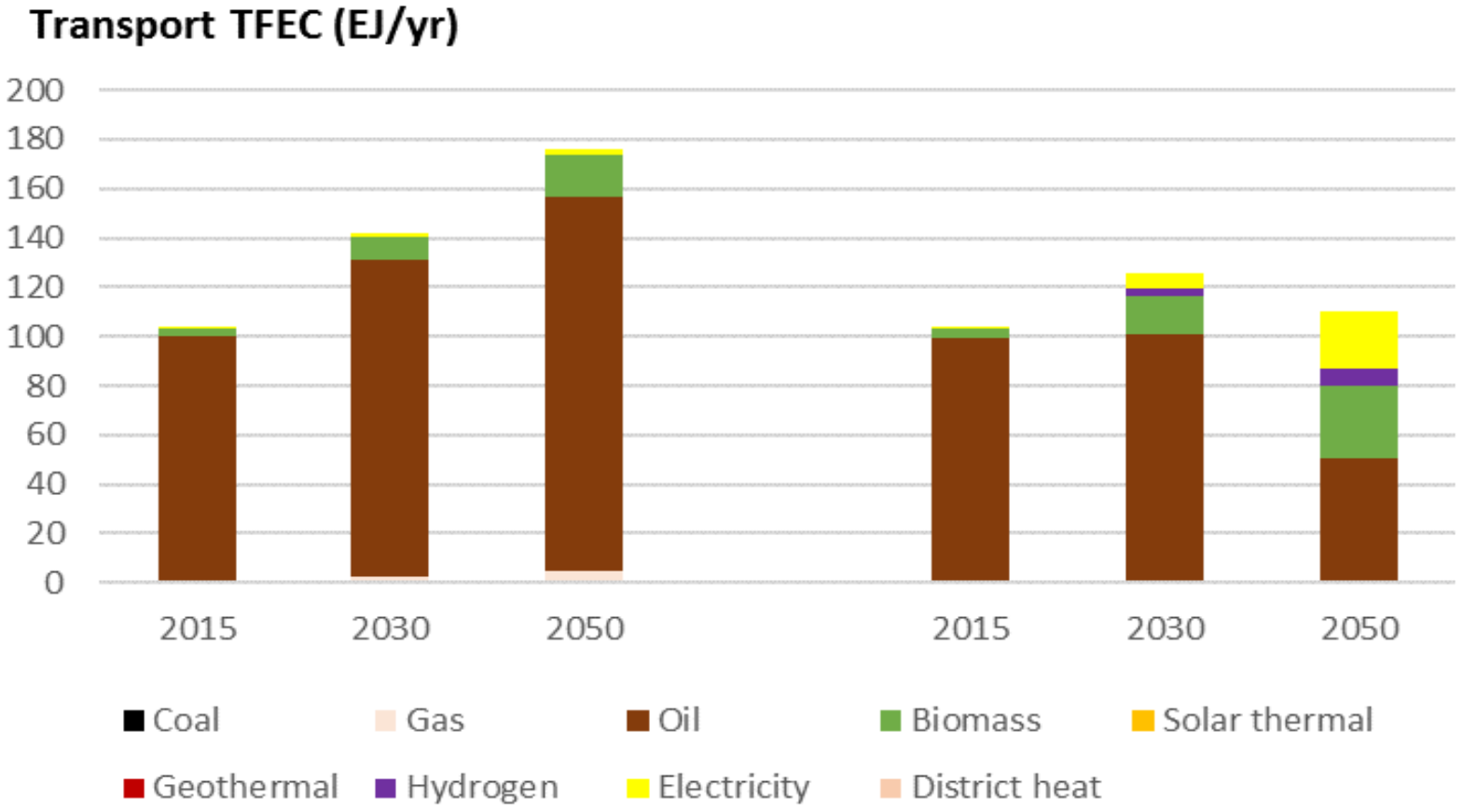
24.4 million jobs in the RE sector by 2030, compared to 9.2 million in 2014

Reduce air pollution enough to save up to **4 million lives** per year

Boost global GDP by up to **$ 1.3 trillion**

Transport, electrification and storage

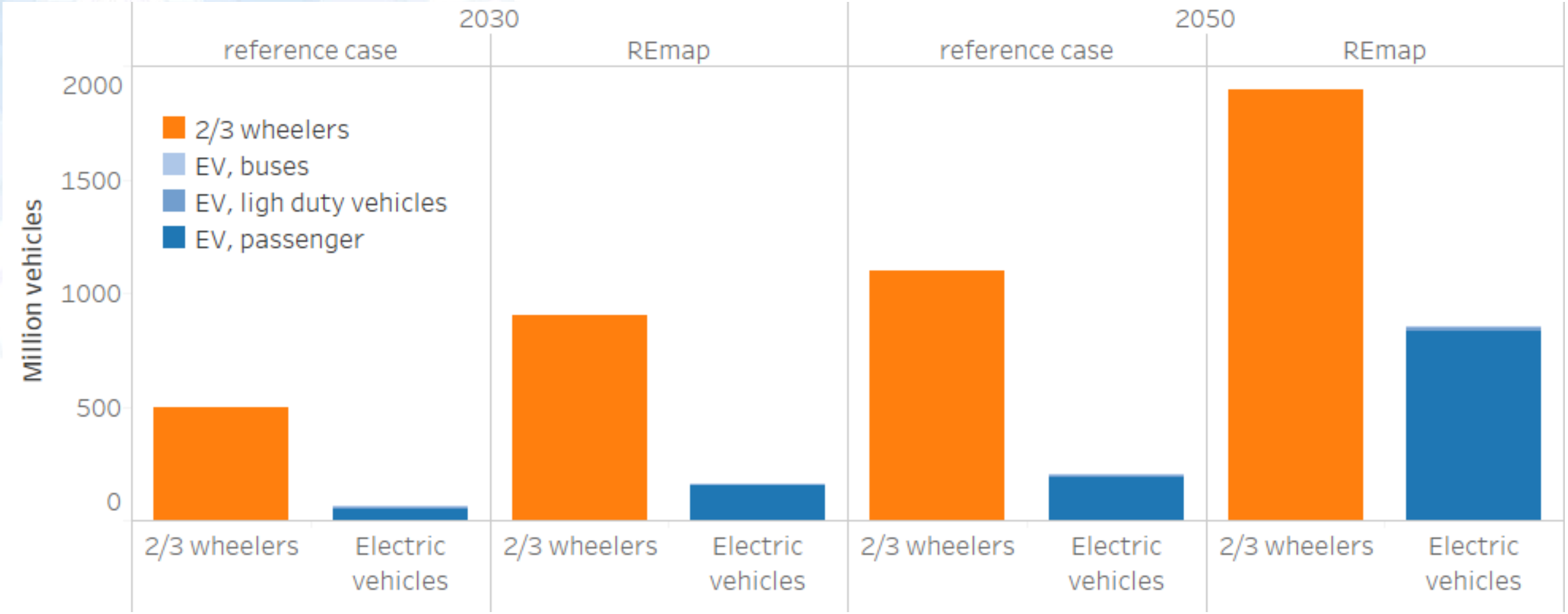
REMAP transport projections



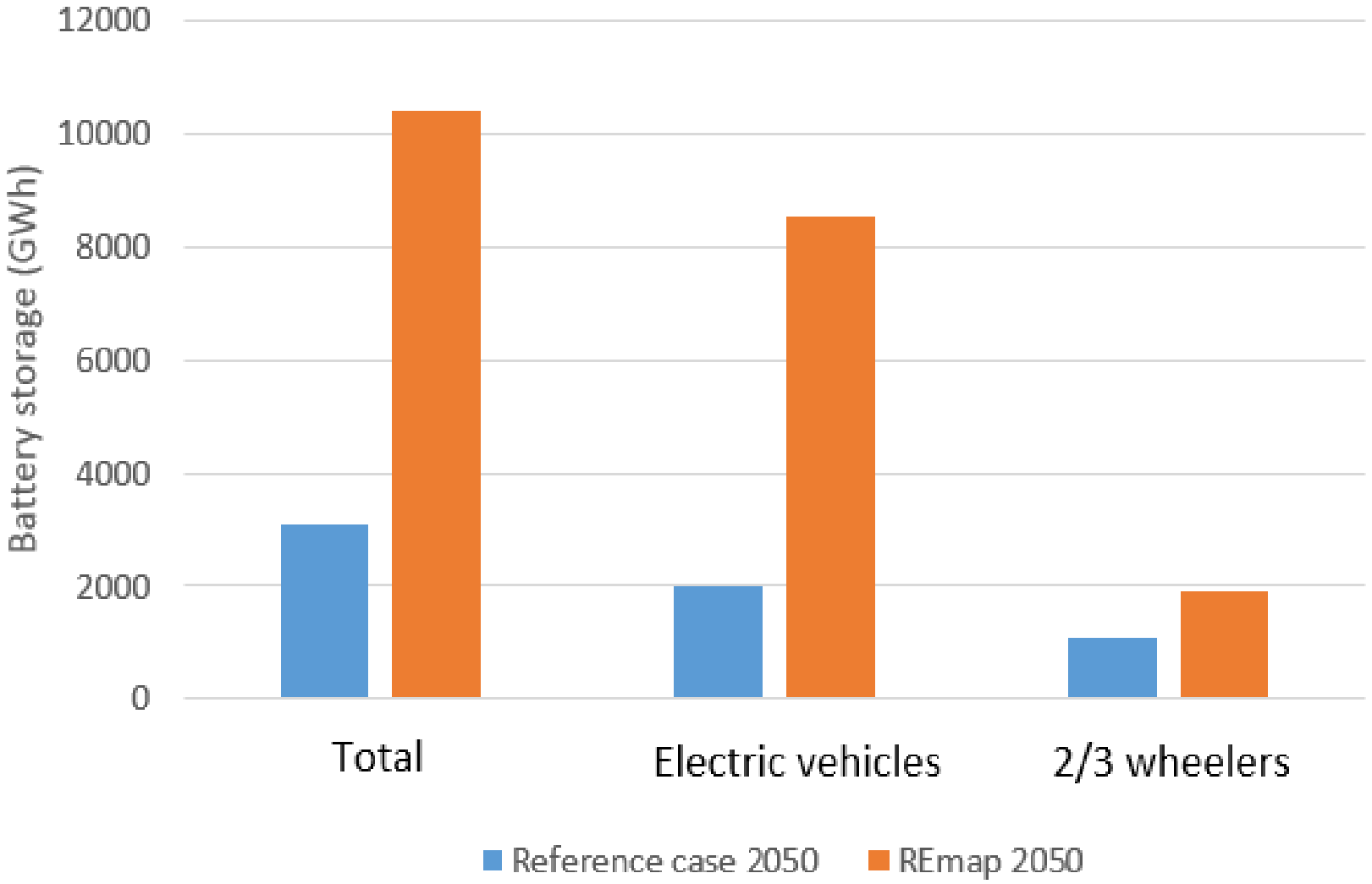
REmap sees a significant increase in electrification which covers more than 20% of the sector's total energy demand whilst bringing important efficiency gains. Biofuels will cover nearly a quarter of all demand

REMAP: The EV fleet evolution

Battery costs declines & performance improvements will play a key role in the growth rates of the EV fleet globally



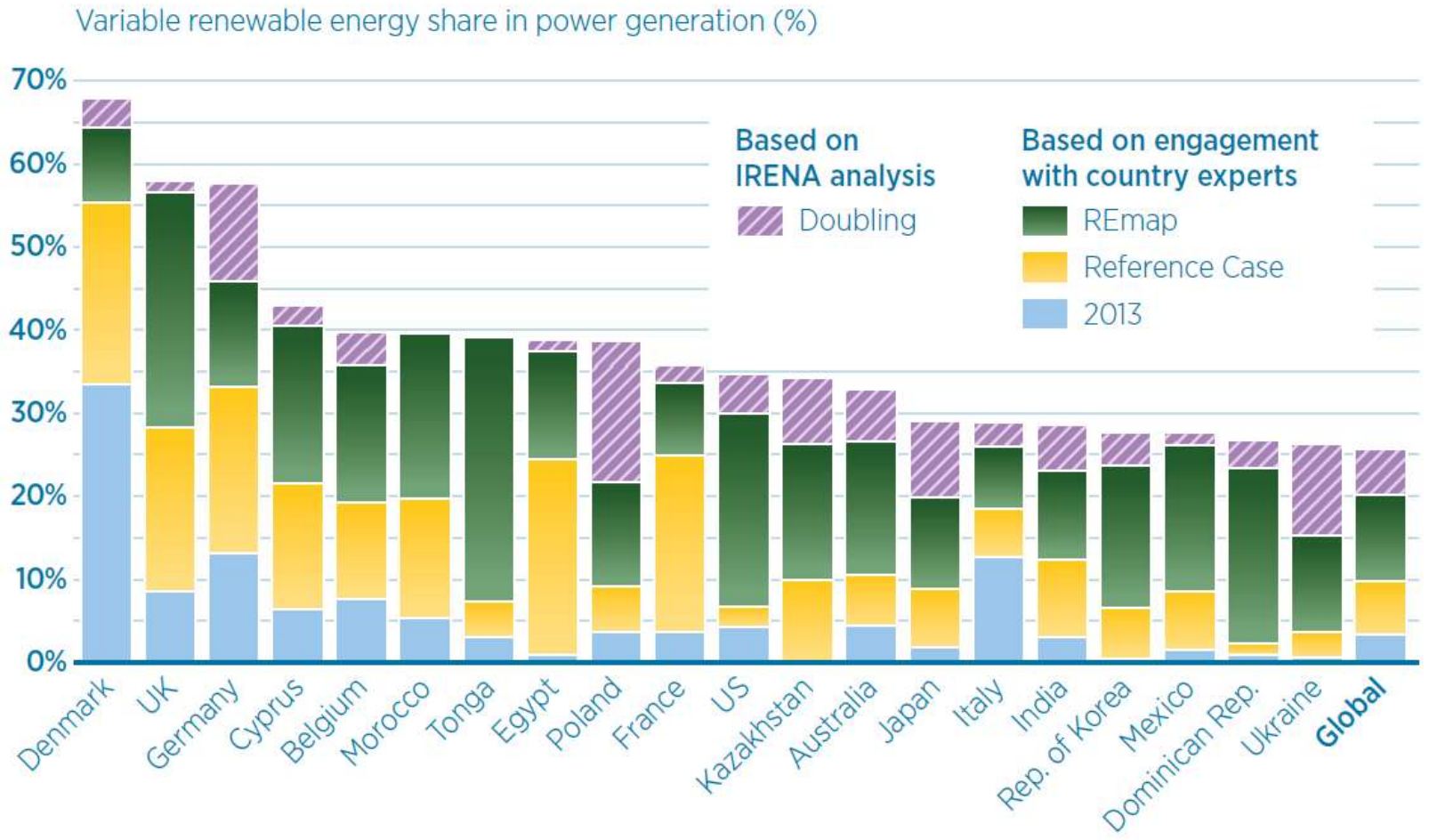
REMAP: EV storage needs



Total battery storage capacity could reach more than 10 TWh in by 2050

Four-fifths of capacity in EVs

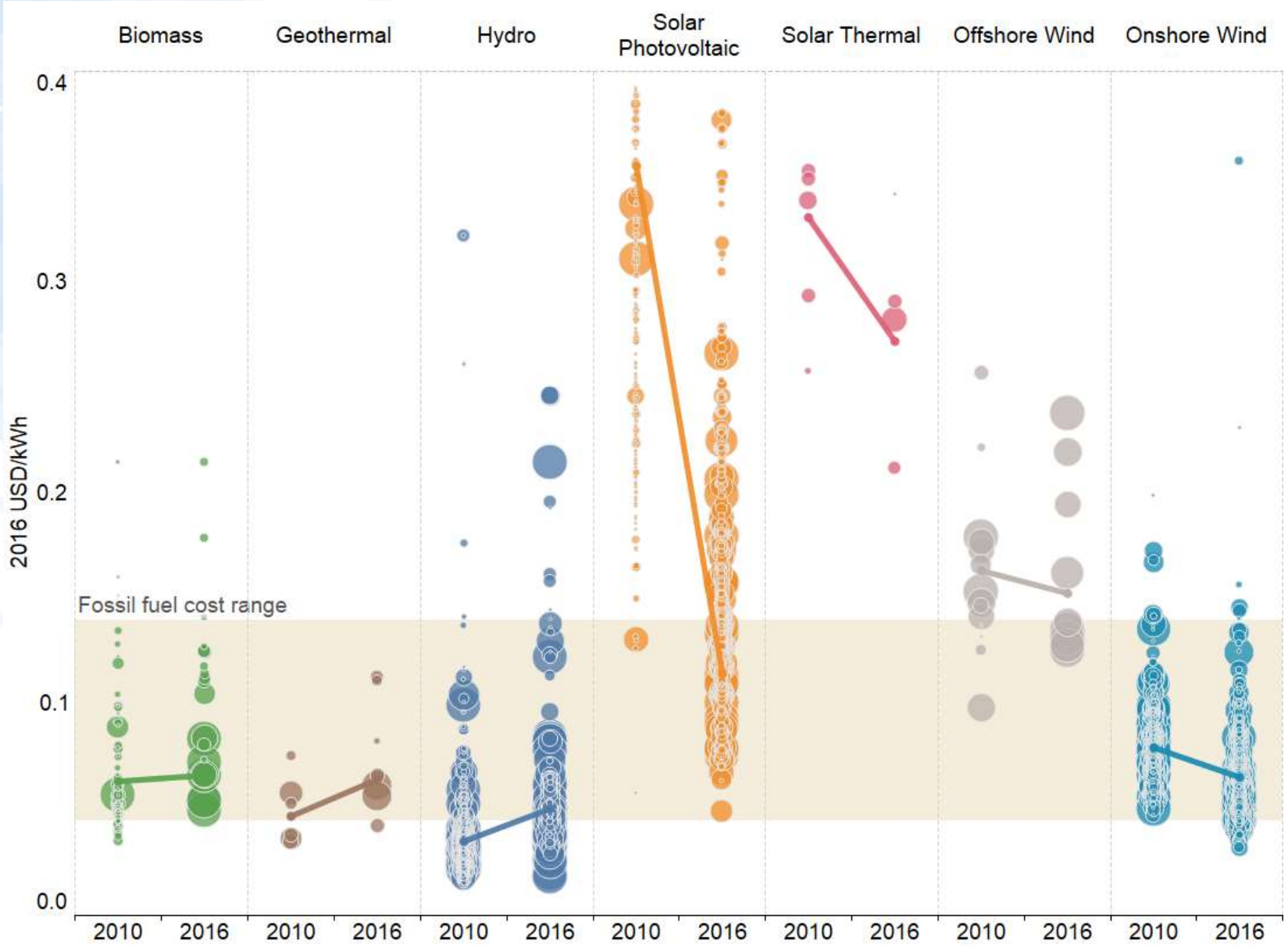
The power sector will lead the way



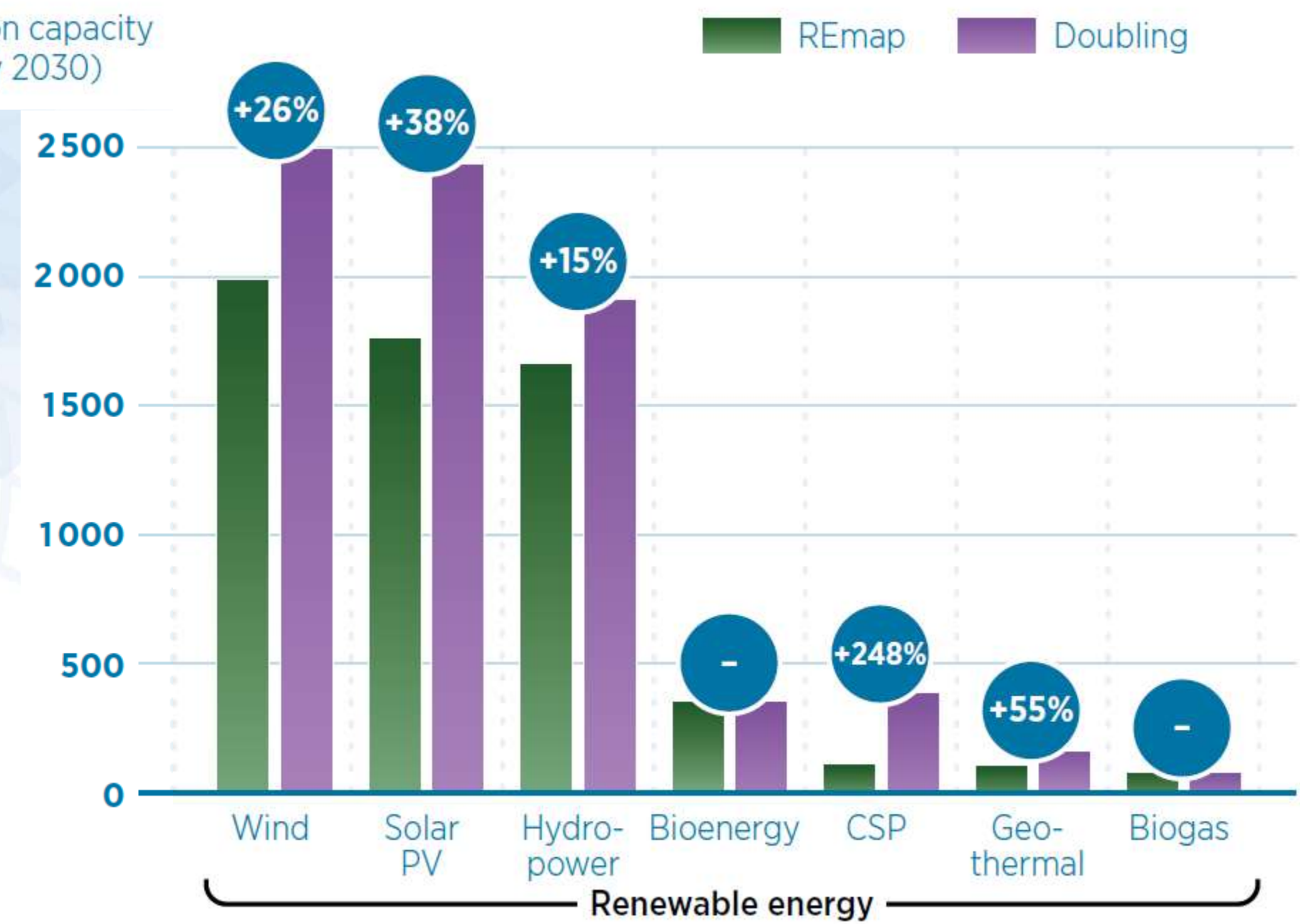
In the Reference Case, 15 of 40 countries will have a VRE share larger than 10% by 2030. With the REmap Options, 20 countries will have a share larger than 25%.

Based on IRENA estima

The power sector will lead the way



Power generation capacity
(GW installed by 2030)



Goals for today

Familiarise you with IRENA's positioning of the analysis

Present the initial results of the analysis

Seek your feedback on analysis/assumptions

Identify any gaps in analysis

Next steps: Feedback, Intersolar, report review