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Securing a Greener Future

Solar in Ireland: Market Snapshot

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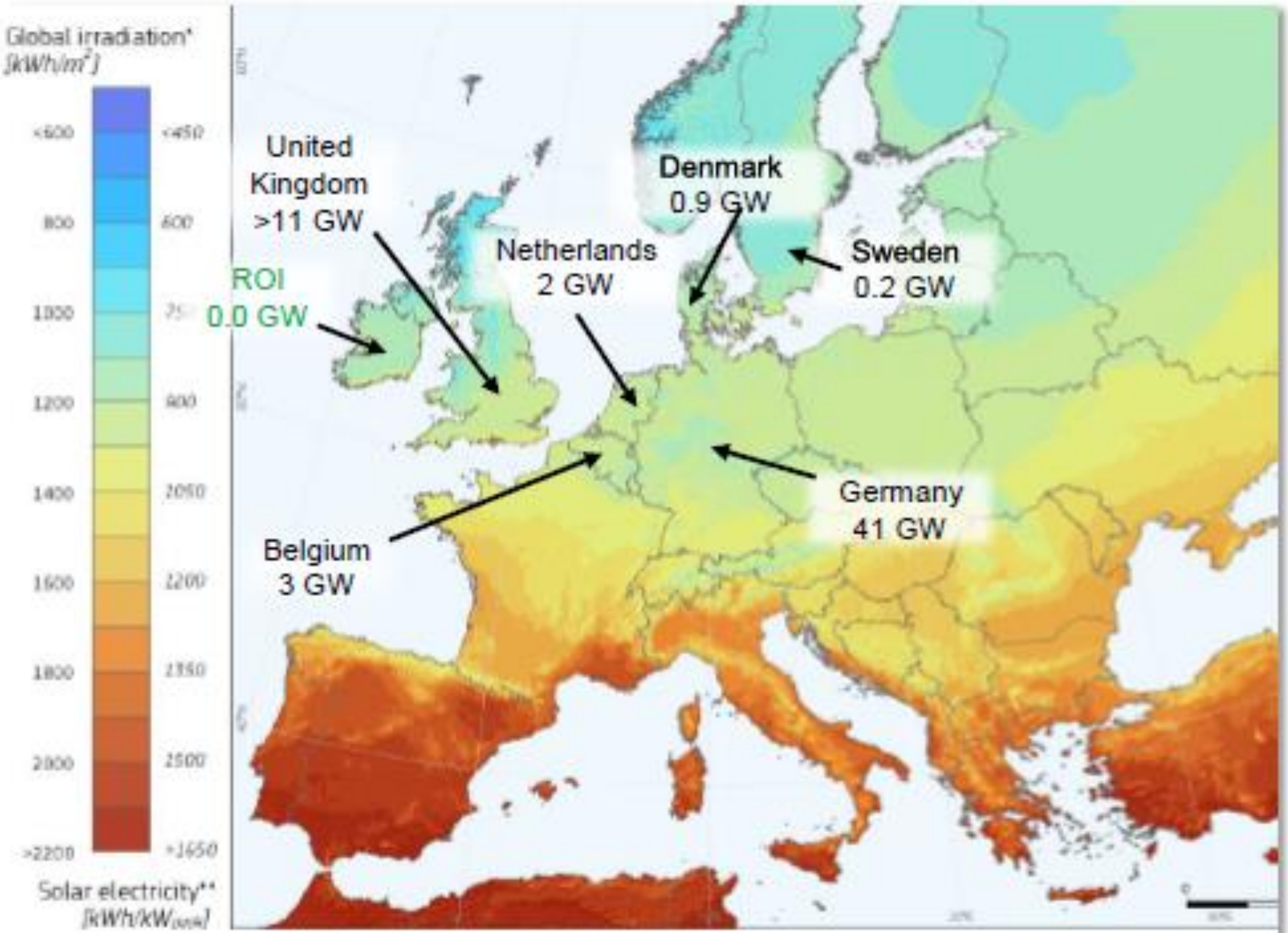
Signatory of:

PRI Principles for Responsible Investment

www.ntrplc.com

Irradiation level in Ireland allows for strong PV market



The Republic of Ireland (ROI) is the only West European country without a significant PV market

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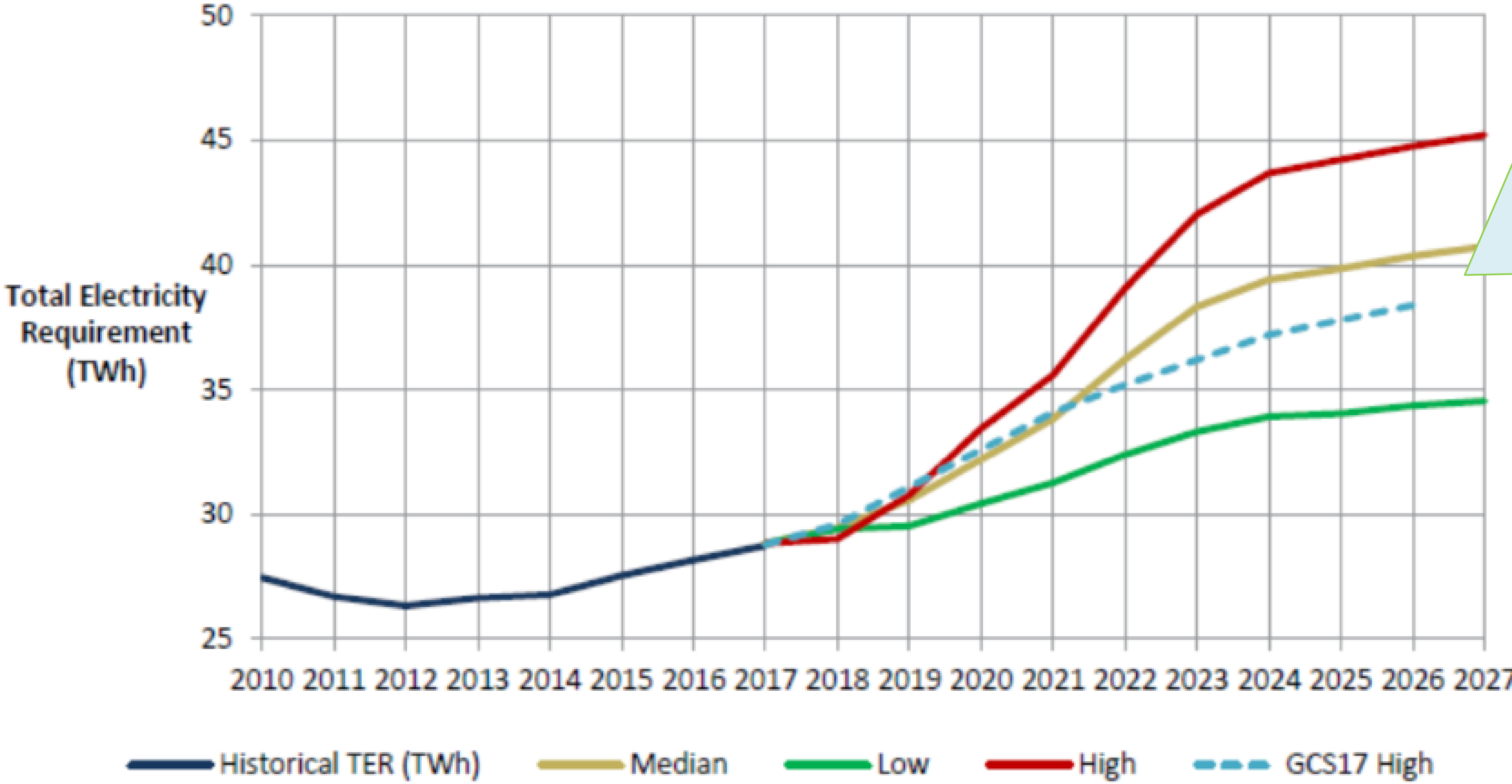
Strong forecast growth in demand of electricity



Median forecast points to >40% growth!

Very strong growth in data centre demand

Source: EirGrid, All Ireland Generation Capacity Statement. 2018-2027

Ireland will not meet it's 2020 targets – renewable power generation needs to double.

While onshore wind has dominated renewable power generation to date, there is a clear need for new capacity additions in offshore wind and solar PV

Policy support for ROI solar has not yet been implemented

2015 2016 2017 2018 2019 2020

2015: White Paper "Ireland's Transition to a Low Carbon Energy Future" for 2015 - 2030

2017: Policy release expected but delayed

July 2018: RESS high level design announced

2019: EU State Aid review completed and "Detailed Design" announced

Q4 2019 / Early 2020: Launch of first auction?

"PV will play a significant role in future energy mix"

Construction

First Renewable Energy Support Scheme (RESS) supported utility scale solar park completions not likely before 2020

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RESS High Level Design (ROI)

- 4 – 5 auctions to deliver 13,500 GWh between 2020 and 2030
- Technology agnostic but with technology cap for auction 2
- Auctions for 2 way Contract for Difference (CfD)
- Various levers to ensure a competitive diverse mix (e.g. targeted delivery dates, administrative strike prices per technology)
- Community is a cornerstone for each auction after the first one

Auction	GWh	Year	Delivery	Tech cap
RESS 1	1,000	2019	2020	No
RESS 2	3,000	2020	2022	Yes
RESS 3	3,000	2021	2025	tbc
RESS 4	4,000	2023	2027	tbc
RESS 5 (poss)	5,000	2025	2030	tbc

Technology	Capacity factor	MWs per 1,000 GWh
Onshore wind	31%	356
Offshore wind	45%	253
Solar PV	11%	1,000
Biomass	85%	134

Eligibility criteria: Land, Planning & Grid

Challenges for Solar (ROI) – and don't forget grid connections!

RESS Related Questions:

- **Deadline for delivery:** grid connection is a risk and grace period should feature
- **Term:** 15 or 20 years?
- **Indexation**?
- **Community benefit:** How administer €2/MWh?
- **Community investment / ownership**: what will be mechanics?

Grid Related Questions:

- ECP-1 awarded 1GW of grid connections in 2018 but back log remains
- Grid curtailment needs to be considered
- Grid connection costs and ongoing maintenance / TUoS fees can be high
- Grid system costs should evolve from per MW to per MWh basis to ensure level playing field with competing technologies

Residential Solar (ROI)

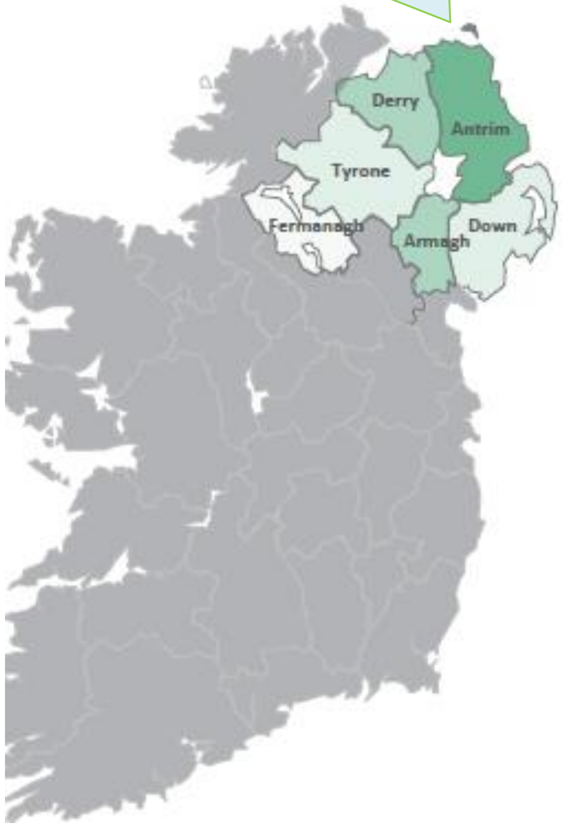
- Irish government introduced a grant scheme for rooftop solar PV in August 2018
  - ➢ Grant of up to €3,800 towards installation costs
  - ➢ For installations >2kWp, a battery must be installed (to promote self-consumption)
- While it welcomed this announcement, the solar industry called for the introduction of a FiT for commercial enterprises / community buildings
- Planning restrictions for roof-top solar to be amended

Residential and commercial rooftop solar is a nascent segment

Solar - Northern Ireland

- Northern Ireland Renewable Obligation Certificate (NIROC) scheme ended 31 March 2017 (similar to GB ROCs)
  - ➢ There was a 12 month grace period for delayed grid connections to 31 March 2018
- Utility scale ground mounted solar grew to c. 250 MWp
  - ➢ Developers such as Elgin Energy, Lightsource and BNRG have been active in NI, as have Canadian Solar…
- NI does not have FiT scheme
- There is potential in the commercial and residential self-consumption segments but the market will take time to develop
- Private wire connections have been completed (e.g. Belfast International Airport)

Quite a number of projects have been located in Antrim & Armagh



Initial focus on utility scale ground mounted solar parks has moved towards commercial & residential