Isle of Man Government

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Welcome to the

Isle of Man Government Conference

Building a better future together

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An overview of the Isle of Man's Energy Strategy

Steve Forden
Head of Energy Policy, DEFA

NET ZERO ISLE OF MAN

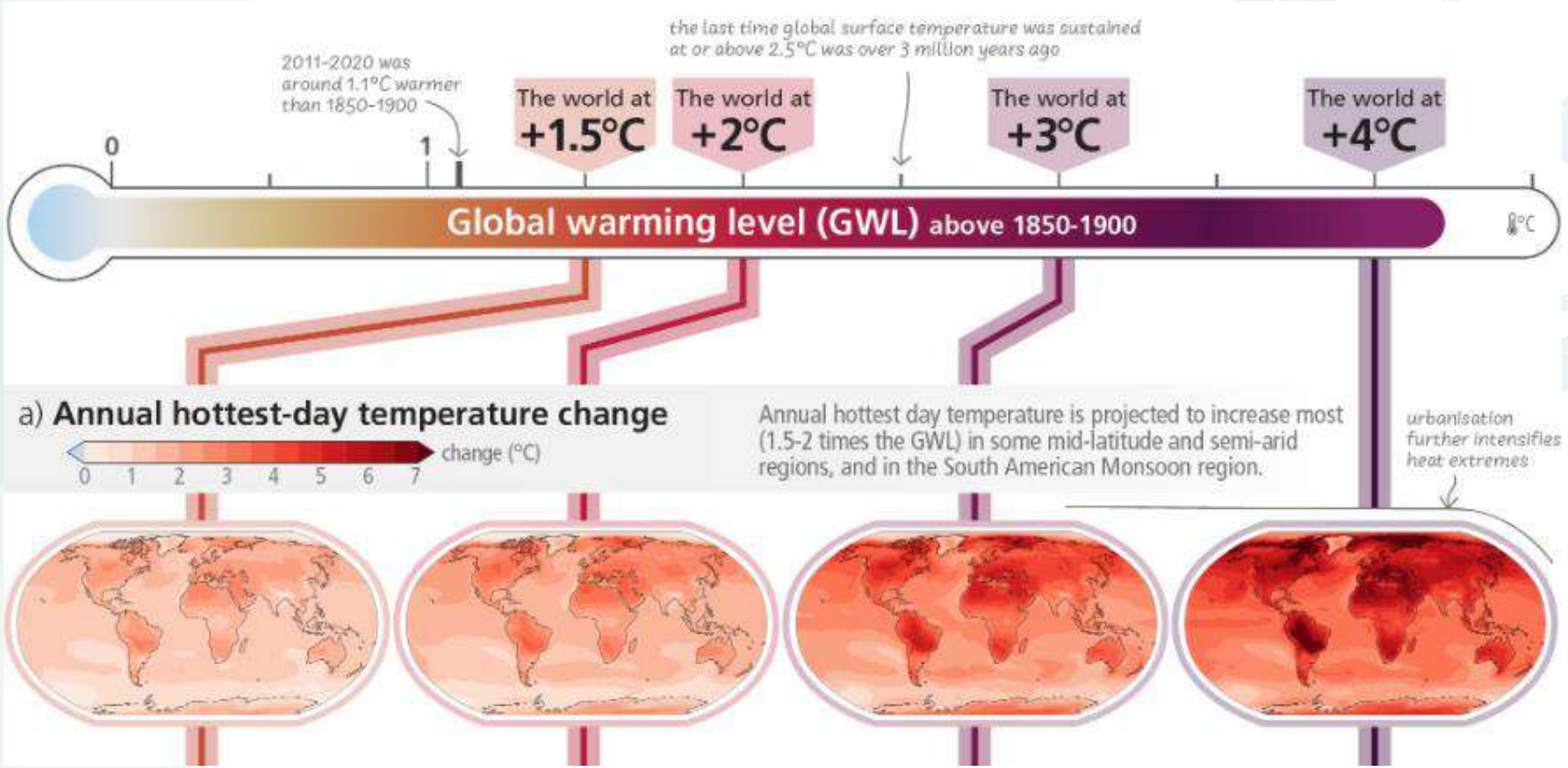

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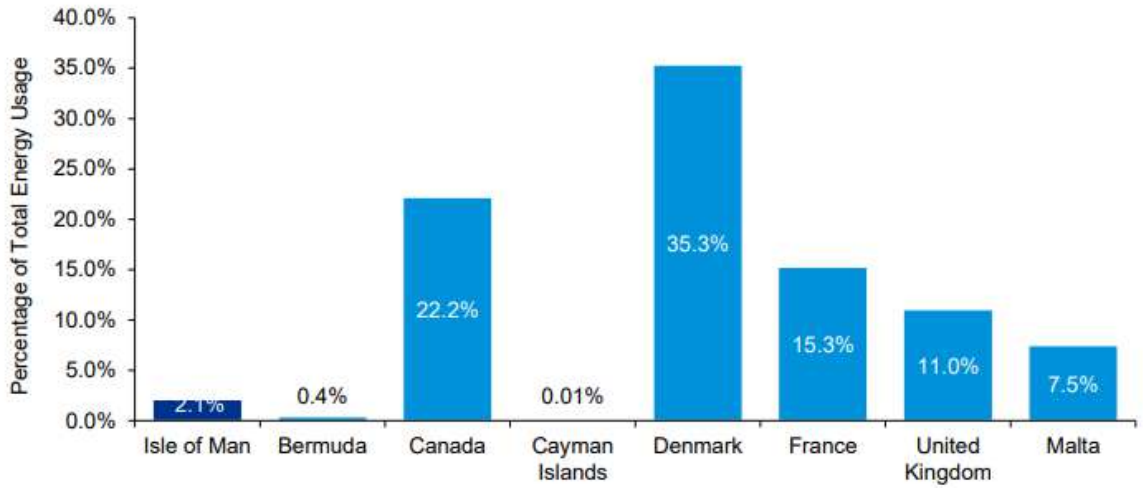
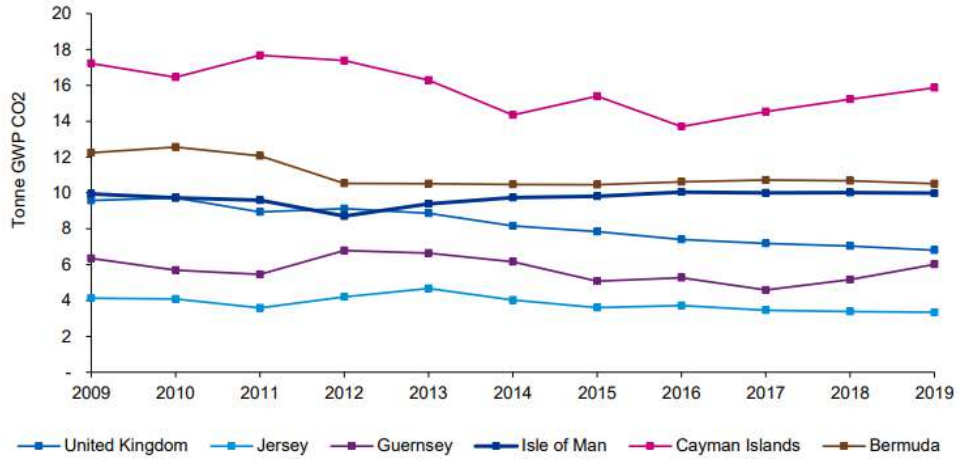
Figure 6.5 Renewable Energy Usage: Isle of Man and comparators: 2018



G20 New Delhi Leaders' Declaration

New Delhi, India, 9-10 September 2023

Figure 6.4 Greenhouse Gas Emissions per capita: Isle of Man and comparators: 2009-2019



SUSTAINABILITY

Substantially decarbonise the services parts of our economy **by 2030**, supporting an overall **reduction of 35%** in the Island's GHG emissions.

By accelerating our **Energy Strategy** to provide **long term security, stability**, and **decarbonisation**, and consciously and proactively **investing in the Climate Change Action Plan**, placing **sustainability** at **the heart of the economy.**

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Europe's Gas Market Is Driven by Anxious Traders

The possibility of strikes in Australia compounds their sensitivity to any disruptions to production or exports.

PRICE

China's LNG Buying Spree Threatens Global Gas Market Stability

3

Editor OilPrice.com

Thu, September 14, 2023 at 1:00 AM GMT+1 · 3 min read

In this article:

NG=F
+0.8493%

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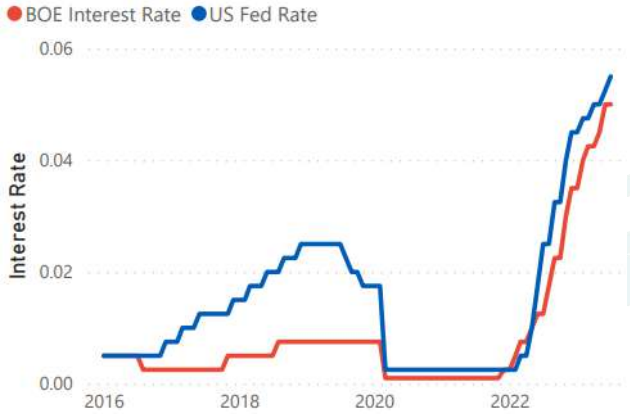
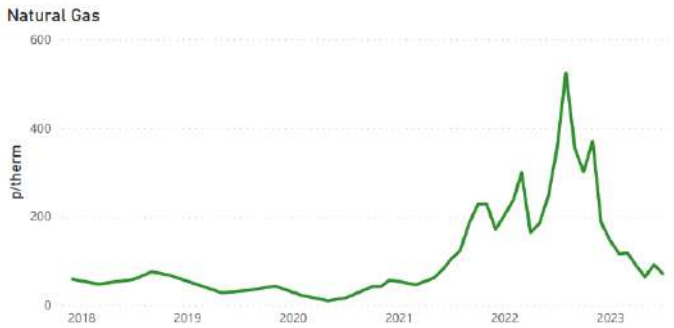
The situation we face has challenges and opportunities

- Fossil fuel dominated energy mix but need to decarbonise
- High levels of grid stability/resilience
- Largely import dependent
- Businesses struggling to meet ESG targets, impacting investment
- Facing a period of major investment requirements and change, against a backdrop of economic pressure





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A number of ambitious targets and actions exist

- Progressing the development of onshore wind and solar (30MW total)
- Emission reduction targets in place for 2030/2050
- Zero carbon power supply by 2030
- No additional hydrocarbon exploration
- Lease for offshore wind with Orsted
- REGOs developed for business

The above sectoral reductions represent a proportional change in total emmissions, over the plan period (2022-2027), putting us on track for net zero by 2050 and the interim targets. If these reductions are achieved, significant back loading (ie. the need for increased effort later in the transition) will be avoided.

	ELECTRICITY	BUILDINGS	TRANSPORT	LAND/AGRI	BUSINESS	WASTE	SEQUESTRATION	Emission reduction from this plan
% sectoral change	-100%*	-15%	-15%	-15%	-15%	-15%	+10%	
% reduction of total emissions	25%	4.13%	3.55%	2.33%	0.53%	1.00%	0.31%	36.85%
Emissions per sector in tCO_2e	-177,428	-28,204	-24,232	-15,925	-3,647	-6,876	+2,121	-258,433

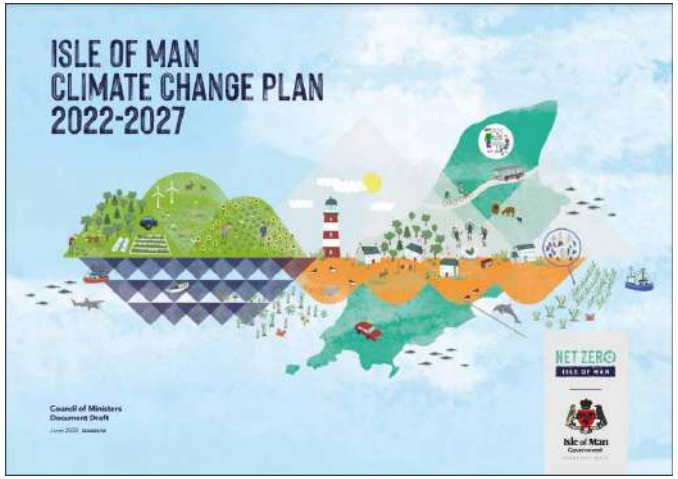
* Electricity sector reduction, 100% by 2030
(Providing a new second interconnector is in place, with carbon neutral electricity being imported from GB.
In exceptional circumstances i.e. emergencies, some fossil fuel generation may be required to support Island demand)

Plans unveiled to decarbonise UK power system by 2035

The plans will focus on building a secure, home-grown energy sector that reduces reliance on fossil fuels and exposure to volatile global wholesale energy prices.

From: Department for Business, Energy & Industrial Strategy and The Rt Hon Kwasi Kwarteng MP

Published 7 October 2021



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What are the goals of the energy strategy?

- To provide support to the delivery of Our Island Plan and the economic strategy
- To provide support to the delivery the Island's net zero targets
- To enable the transition of energy generation to occur in an economically efficient manner, when considering the economy as a whole
- To ensure the energy transition to occur in a manner that is fair and equitable
- To ensure that people and businesses are able to benefit from decarbonisation
- To make greater use of our own energy resources
- To increase energy independence
- To maintain the Island's existing levels of power system resilience

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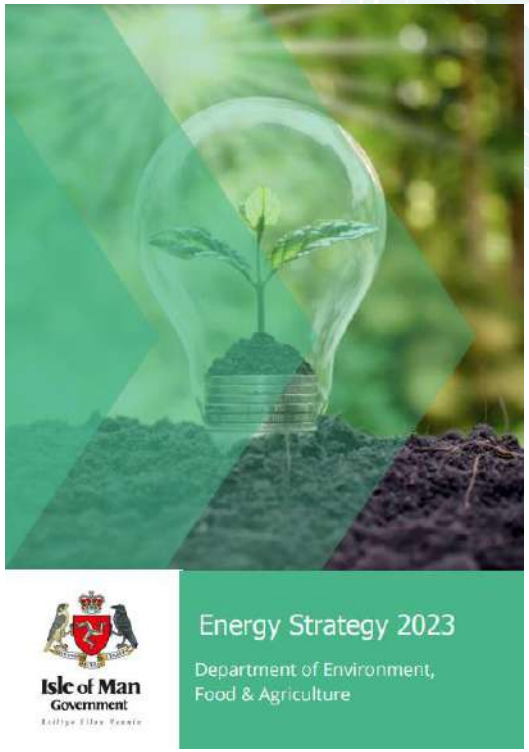
The energy strategy outlines a series of foundational policy principles

- These are the building blocks of our future energy policy and set the overarching policy framework in which we will operate
- Further work needed on each to flesh out and develop more specific policies
- We will produce an annual update showing progress and policy development



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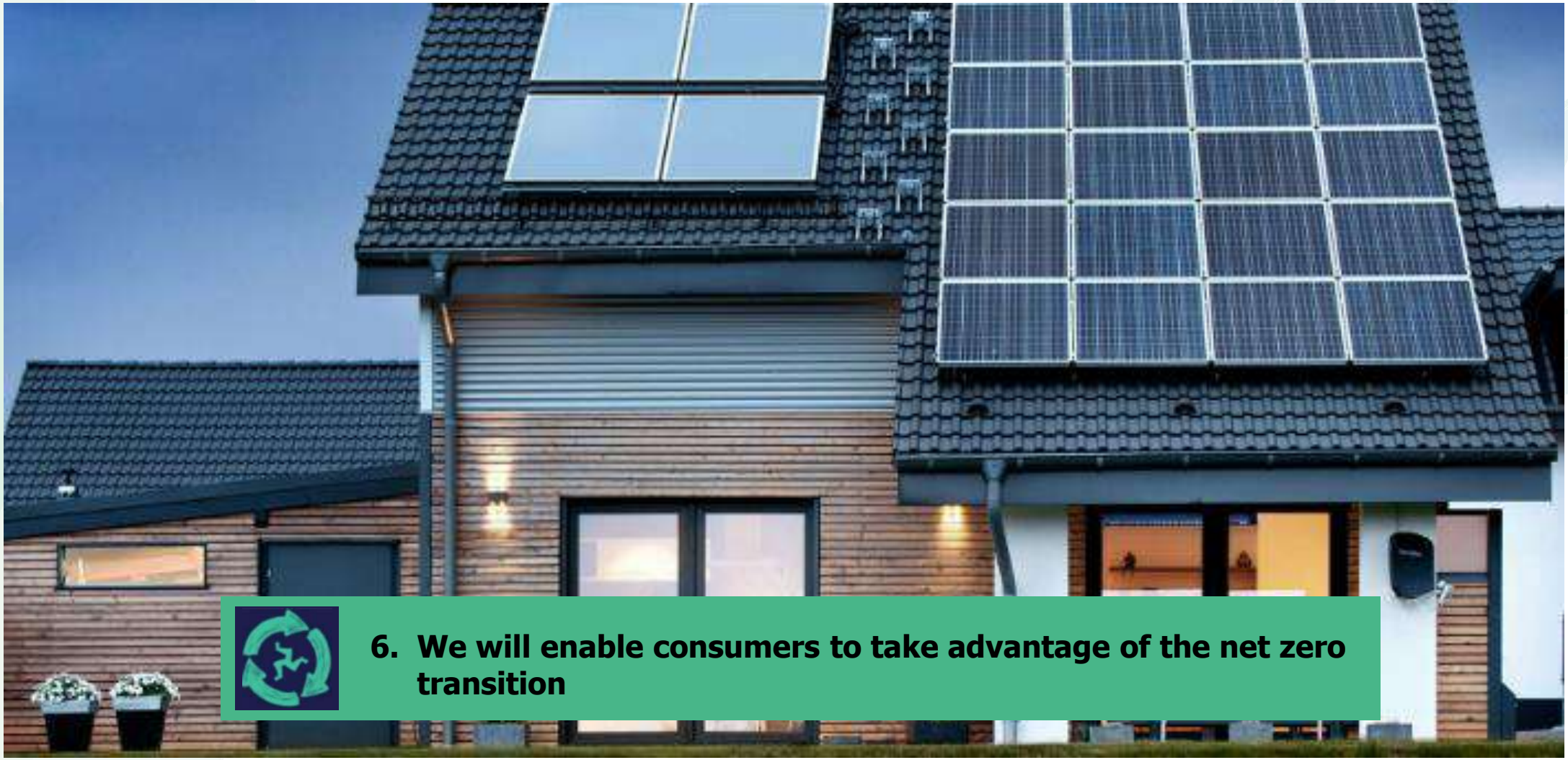
1. We will increase our energy independence and security through on Island renewables and carbon neutral energy generation

2. We will optimise the level of on Island renewables and carbon neutral energy generation

3. We will provide a supportive environment for business low carbon needs

4. We will work to deliver offshore wind and scope out a future licencing round for offshore wind

5. In the near term, Government procured renewables projects will be in public ownership, to deliver the lowest cost to the consumer



6. We will enable consumers to take advantage of the net zero transition

Thank You

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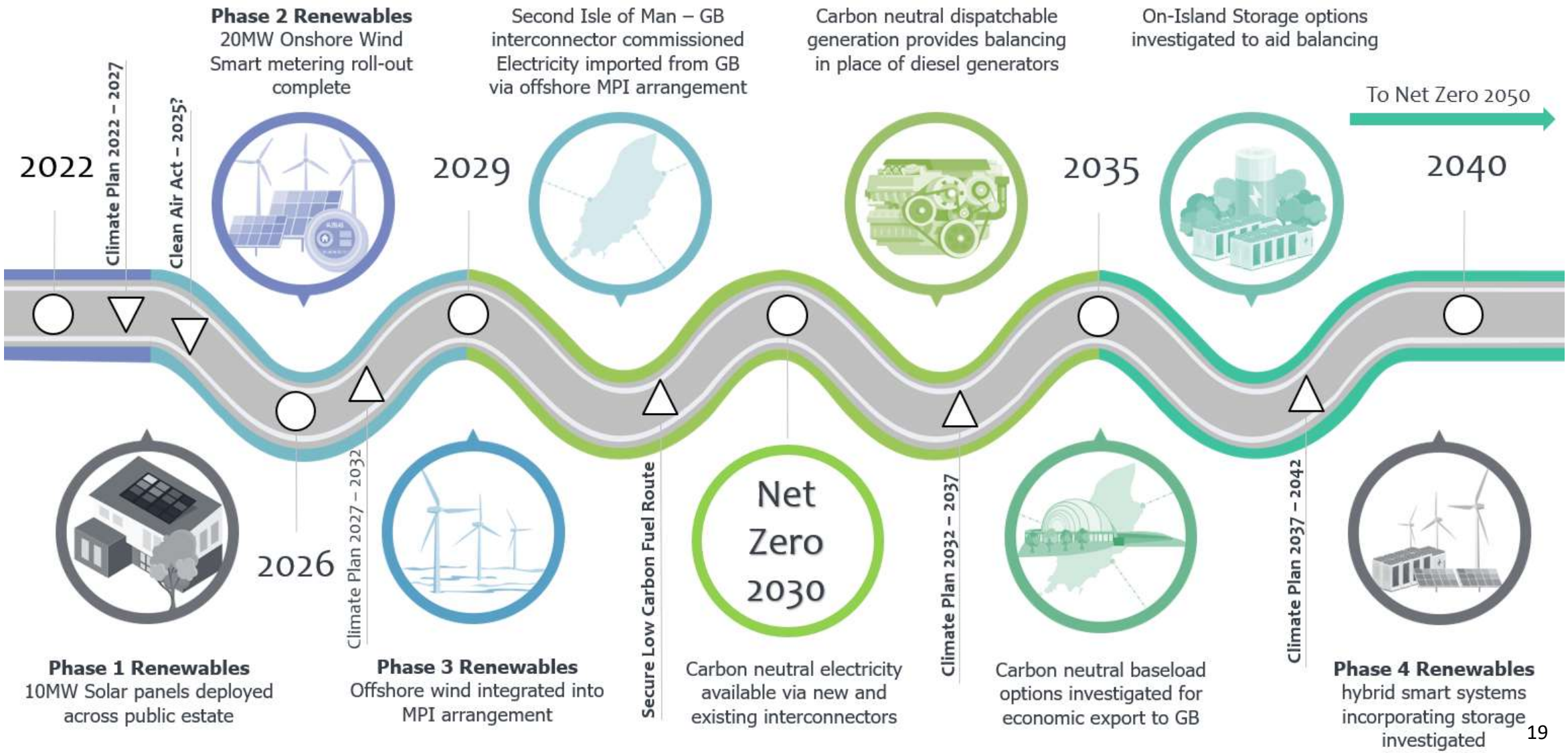
Future Energy Delivery Strategy

Lizzie Riley | Manx Utilities

ENERGY TRANSITION ROADMAP



POLICY OVERVIEW

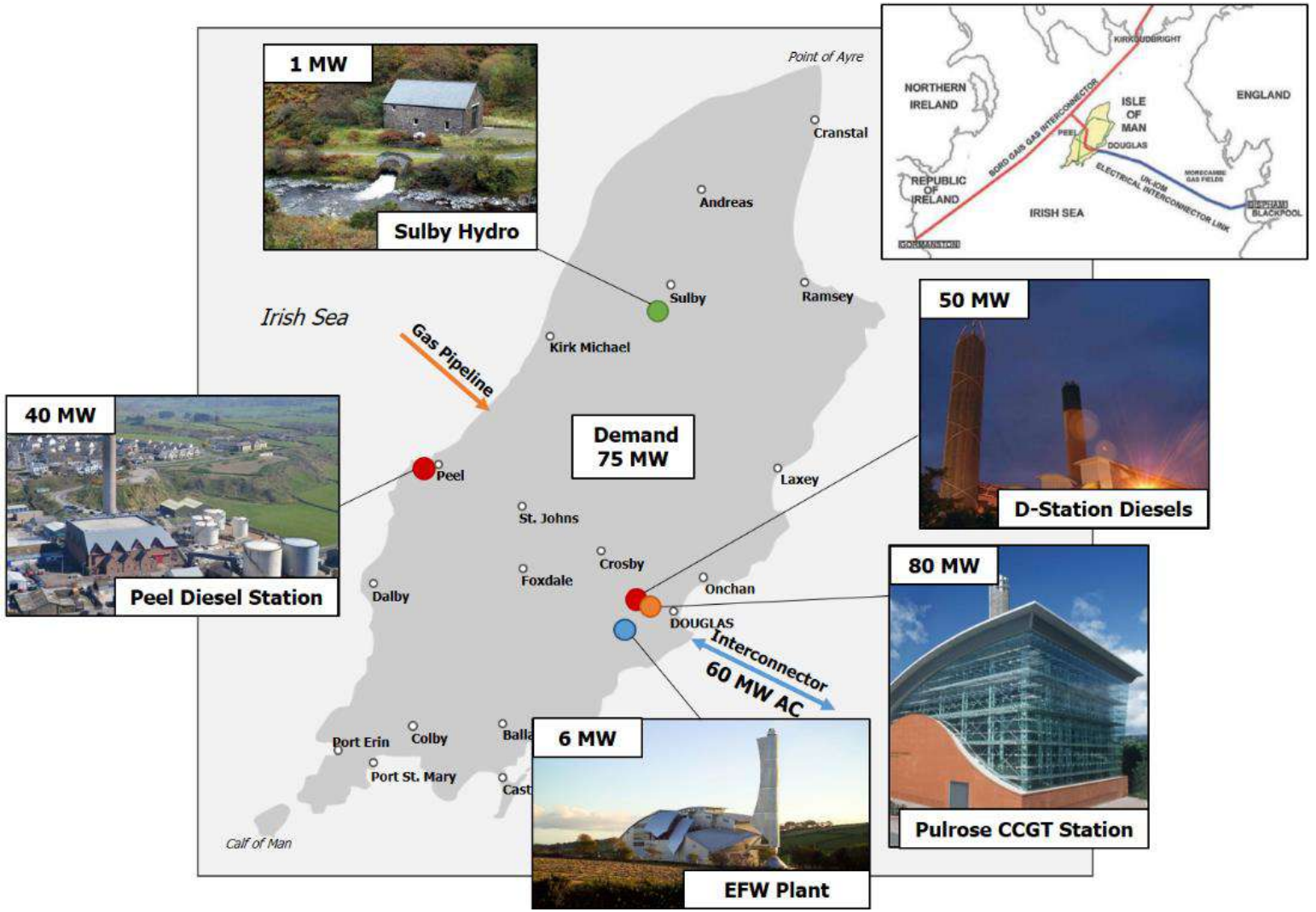
- **Climate Plan 2022 – 2027**
  - 100% Decarbonised electricity supply by 2030
  - At least 20MW onshore renewables by 2026
  - Delivery of a second interconnector by 2030

- **Island Plan**
  - Council of Ministers set two targets for Manx Utilities to:
    - Deliver a 20MW onshore windfarm by 2026 on public estate
    - Deliver 10MW solar across the public estate
  - First phase of onshore renewables will be publicly owned

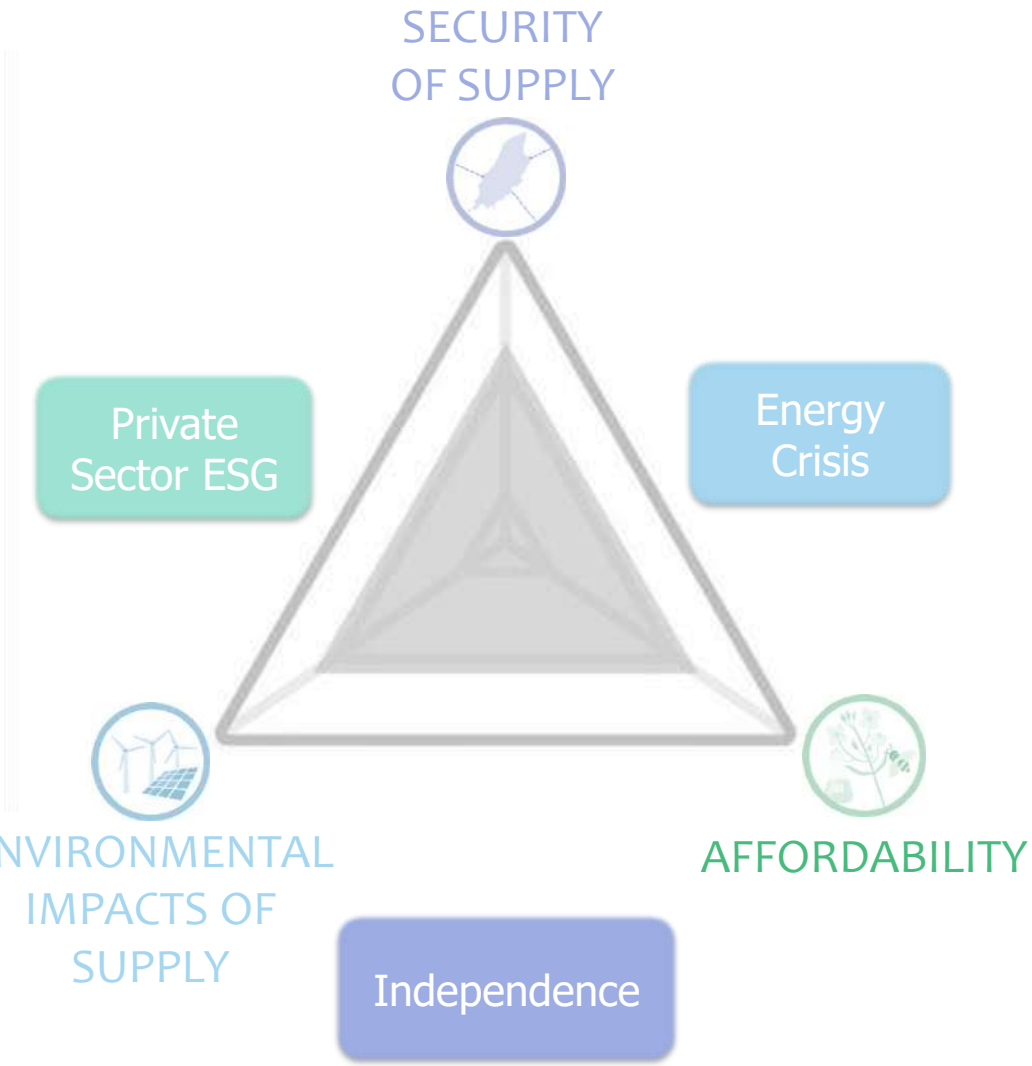
- All targets supported by DEFA's Energy Strategy

BACKGROUND TO ELECTRICITY SUPPLY ON THE ISLE OF MAN

BACKGROUND OF ELECTRICITY SUPPLY ON ISLAND



ENERGY TRILEMMA



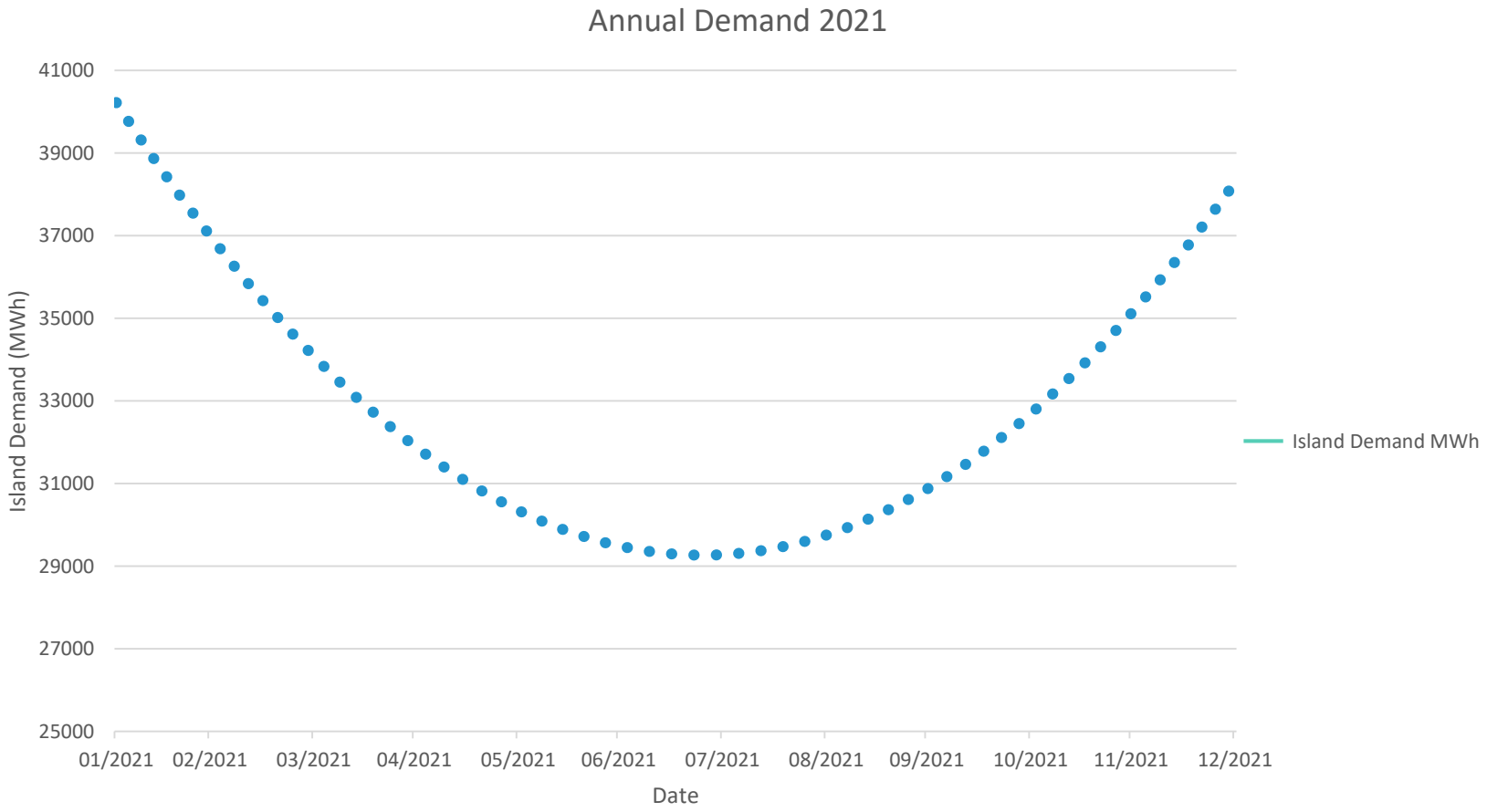
The energy trilemma represents the balance between:

1. Affordability: the economic supply of electricity at the point of delivery to consumers

2. Security of supply: the ability to meet Island demand in a safe manner, providing layers of resilience and maintaining compliance with statutory limits at all times

3. Environmental Impacts of Supply: meeting any relevant Government target relating to climate change as well as considering any adverse impact on the local environment.

ISLAND DEMAND ACROSS A YEAR

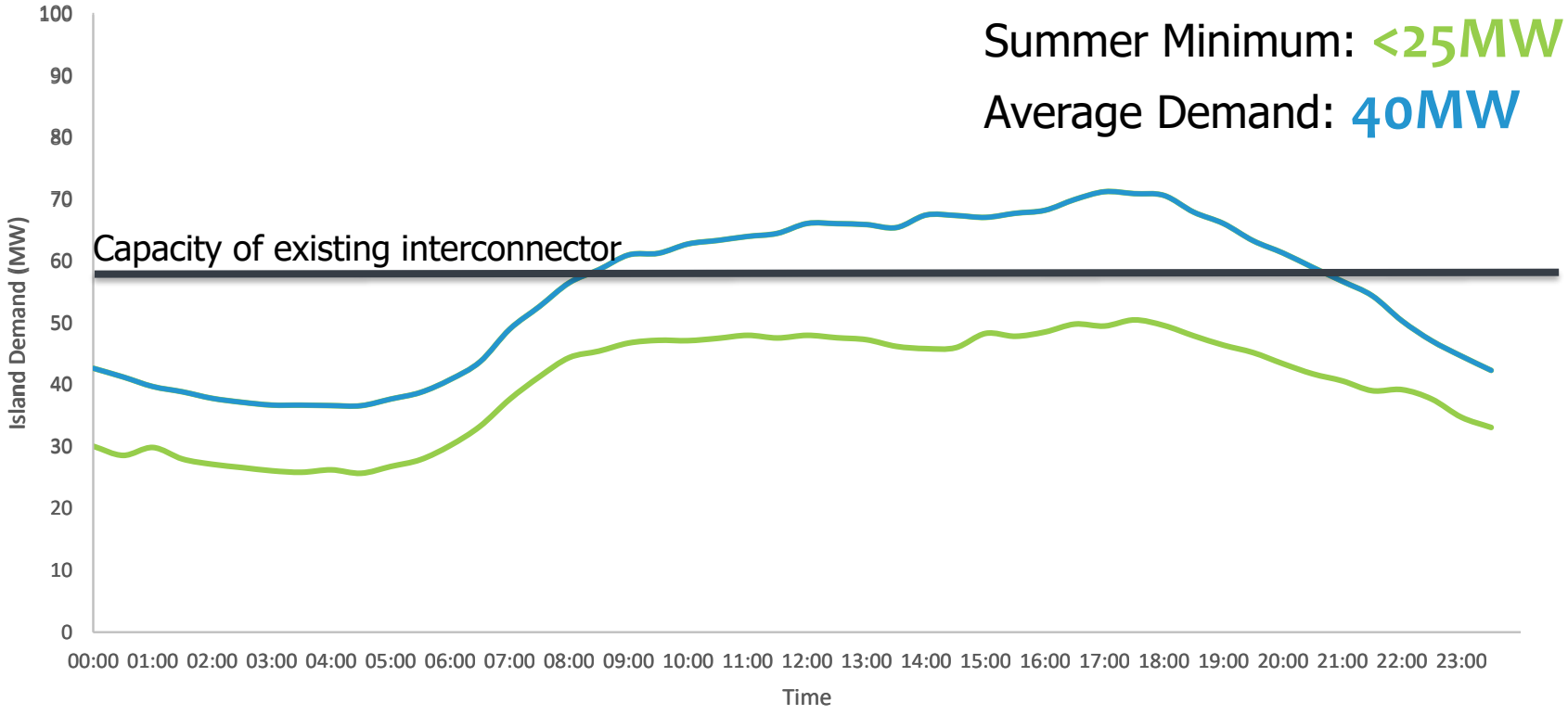


ISLAND DEMAND ACROSS THE DAY

Winter Peak: 73 MW

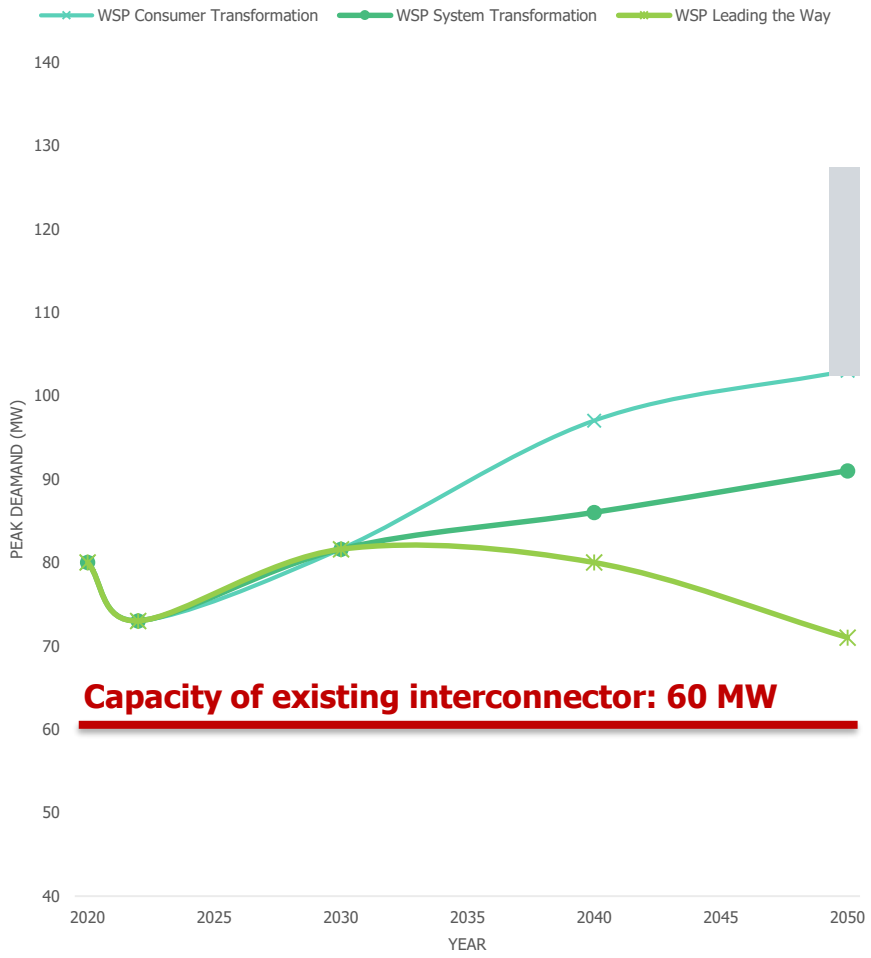
Summer Minimum: <25MW

Average Demand: 40MW



STEPS NEEDED TO MAINTAIN SECURITY OF SUPPLY

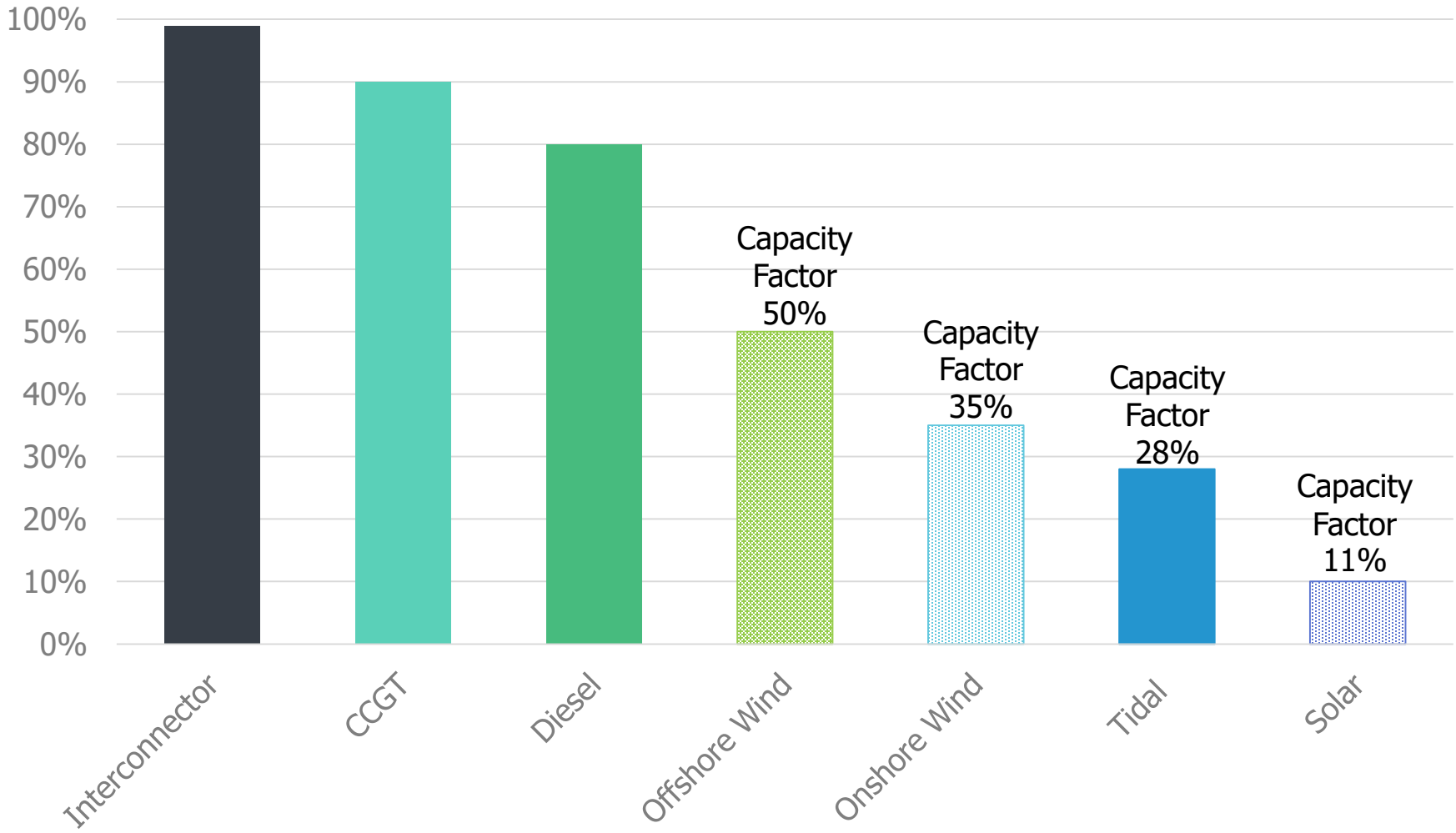
DEMAND FORECASTS



WSP, 2022

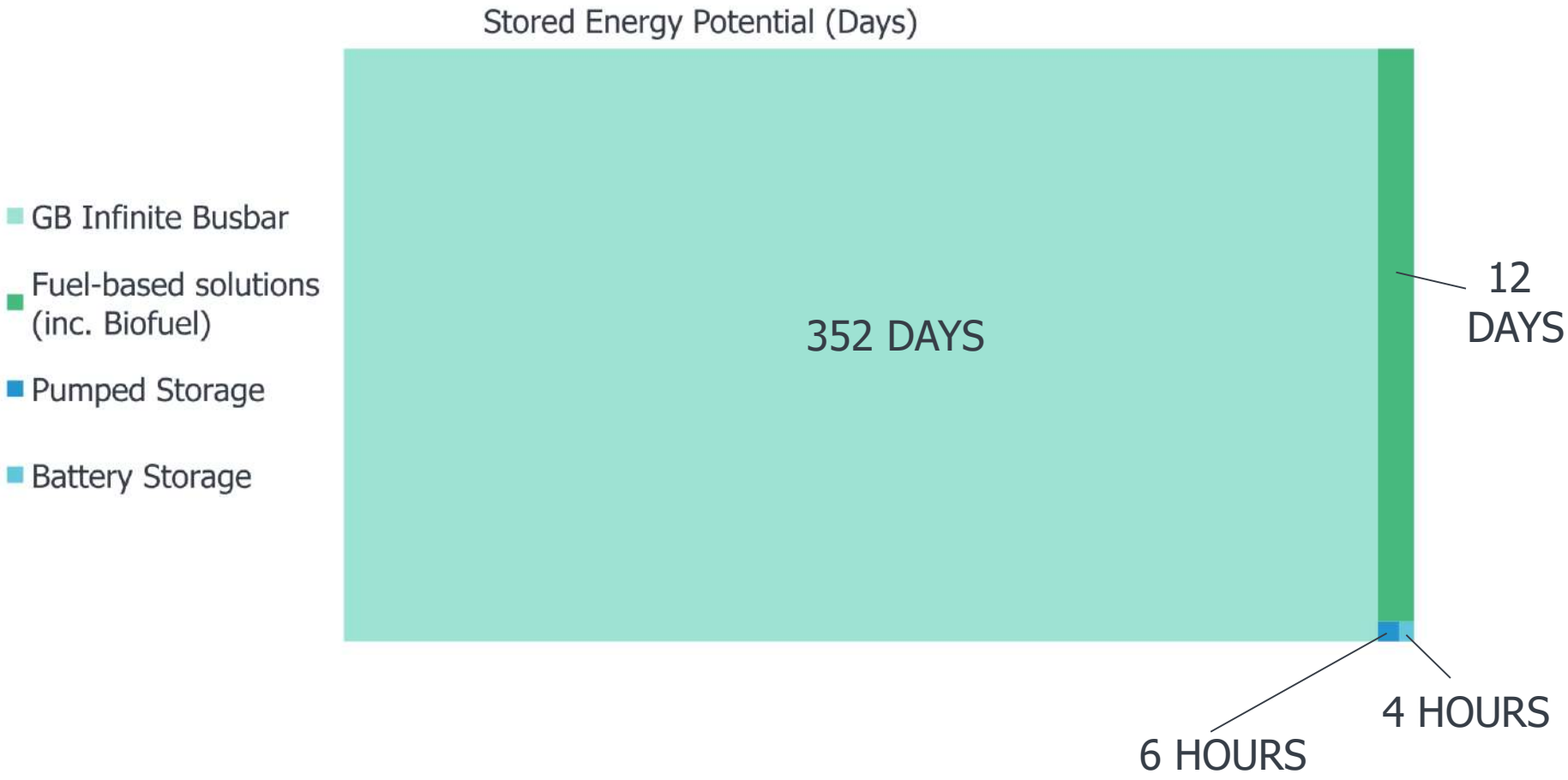
WSP (2022)	Consumer Transformation	System Transformation	Leading the Way
2030 Peak	81.6 MW	81.6 MW	81.6 MW
2050 Peak	103 MW	91 MW	71 MW
2050 Annual	636 GWh	554 GWh	514 GWh

AVAILABILITY OF TECHNOLOGY



Clarity of the bar shows the predictability of each technology

EVALUATION OF STORAGE



LOCAL ON-DEMAND GENERATORS

- Options for Generation: **70 MW**
  - Conversion of Pulrose GTs to run on carbon neutral fuel (limited to biofuels)
  - New generation assets – Allam Cycle GTs, Reciprocating Engines

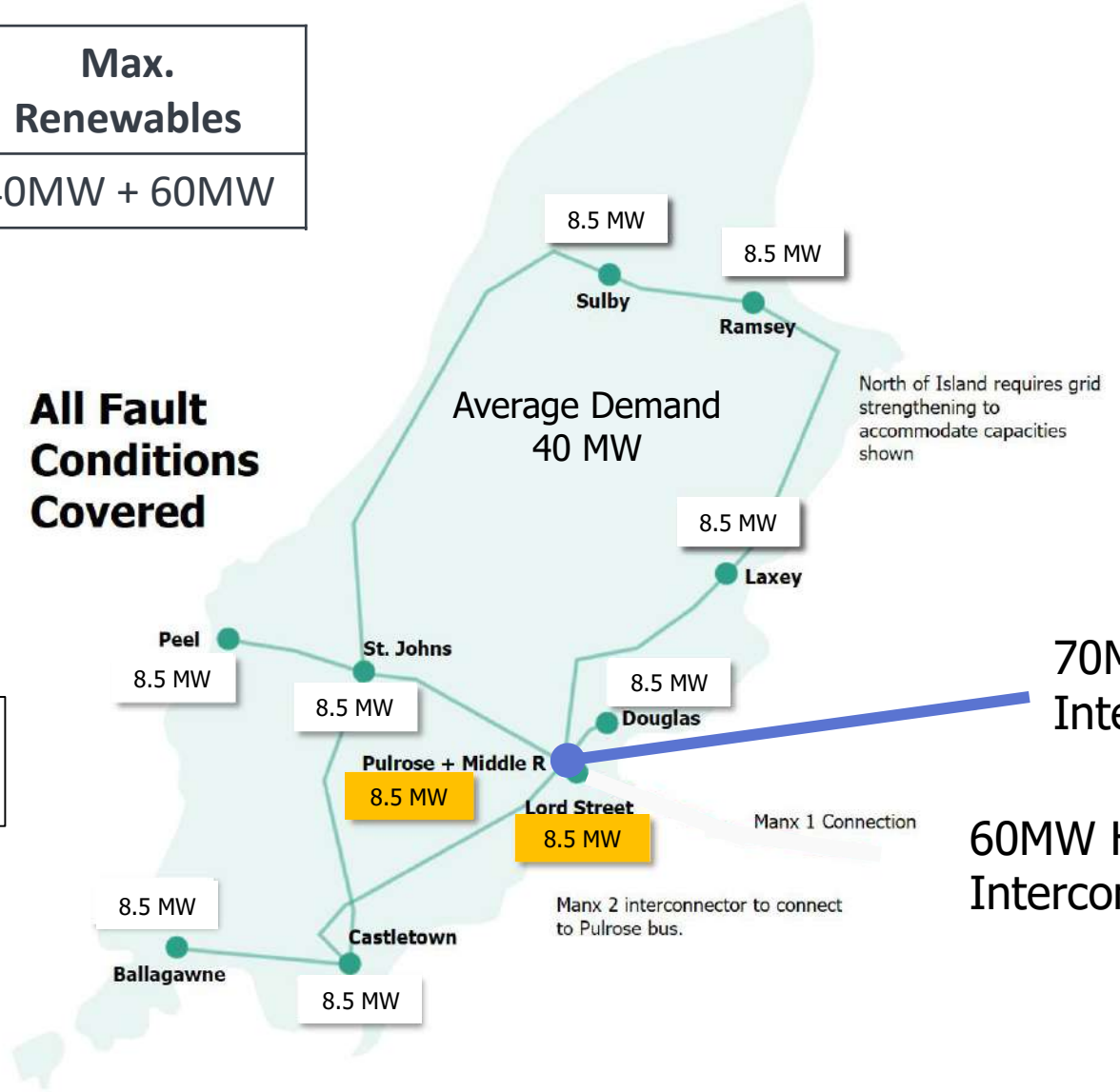
- Options for Carbon Neutral Fuel:
  - Hydrogen (not currently commercially viable)
  - Biofuels (feedstock not **currently** available on Island)

Available Feedstock: (Security of Supply) c.35 GWh	Feedstock required for export: c.100 GWh

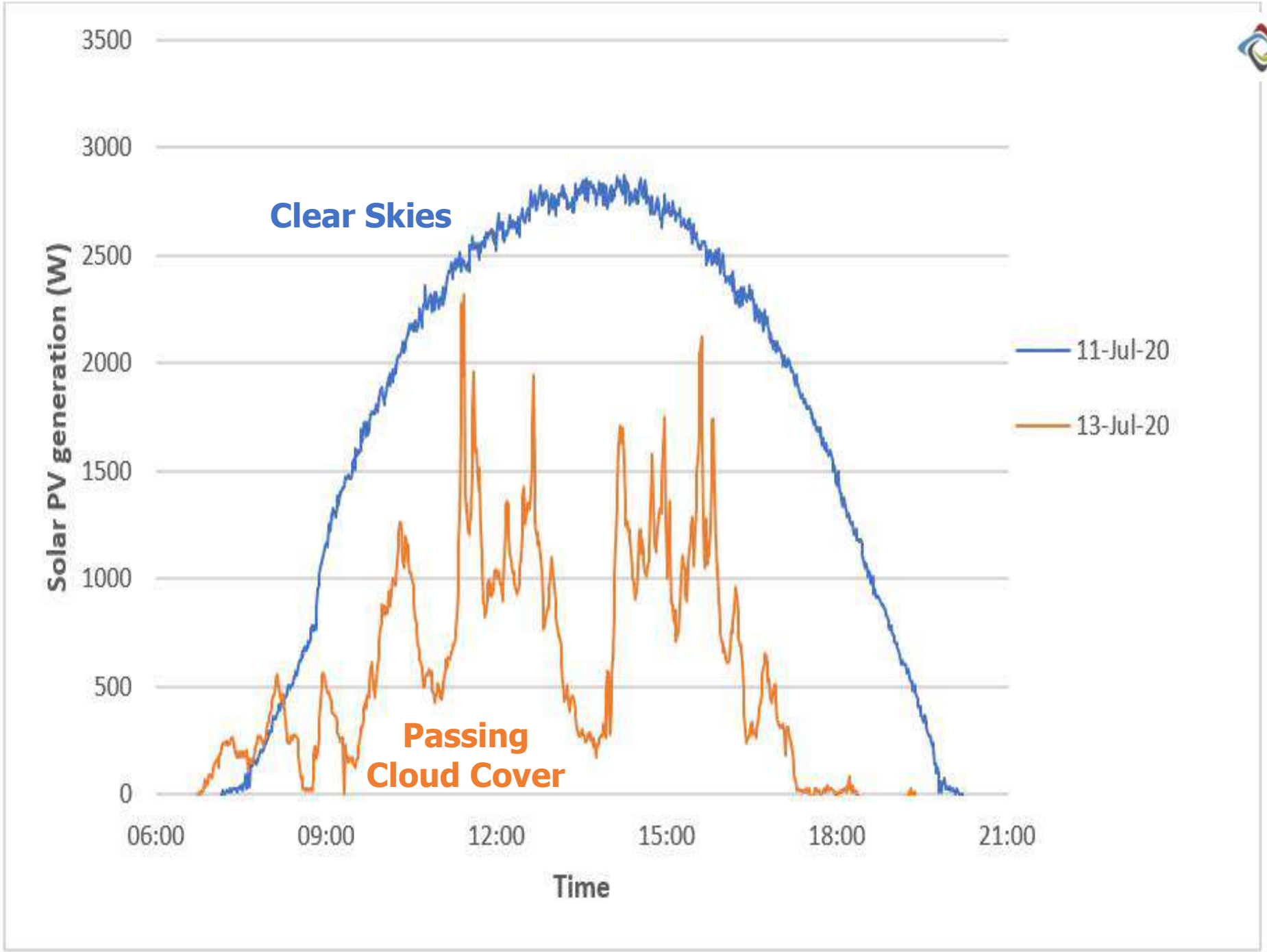
INTRODUCING RENEWABLES

ISLE OF MAN POWER SYSTEM

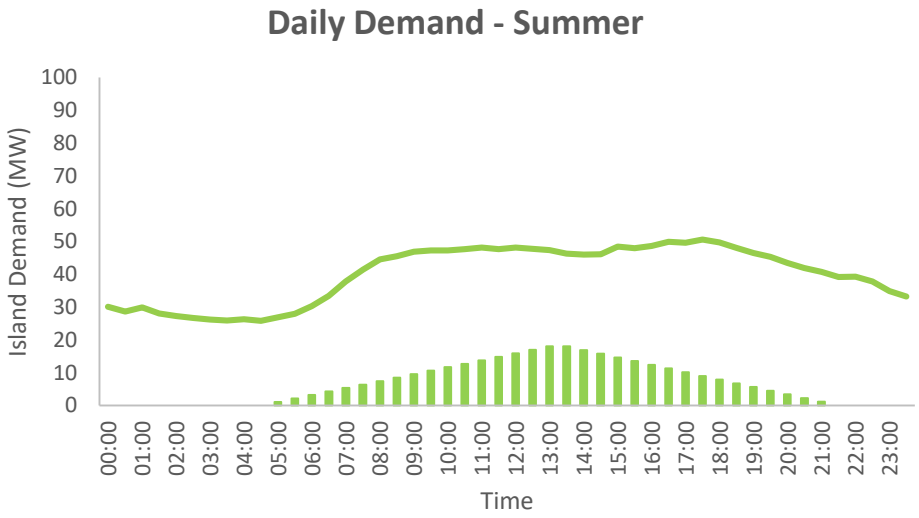
Number of Interconnectors	Max. Renewables
1	40MW + 60MW

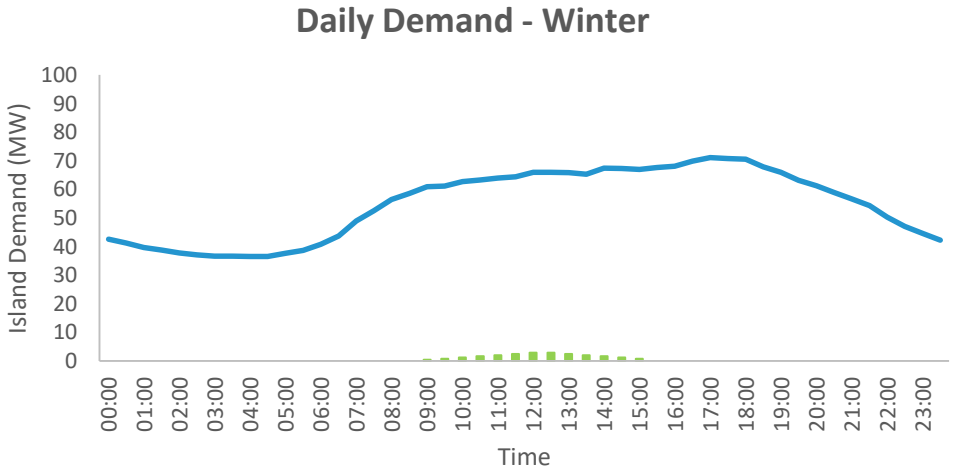


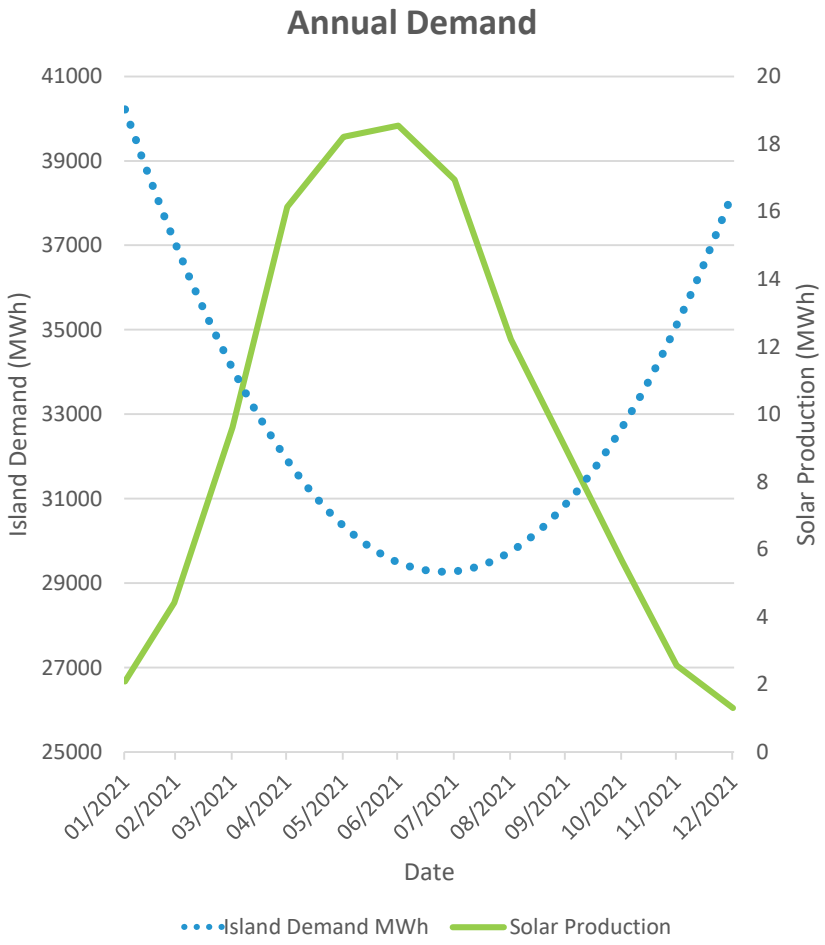
ISLAND MODE
8.5 MW

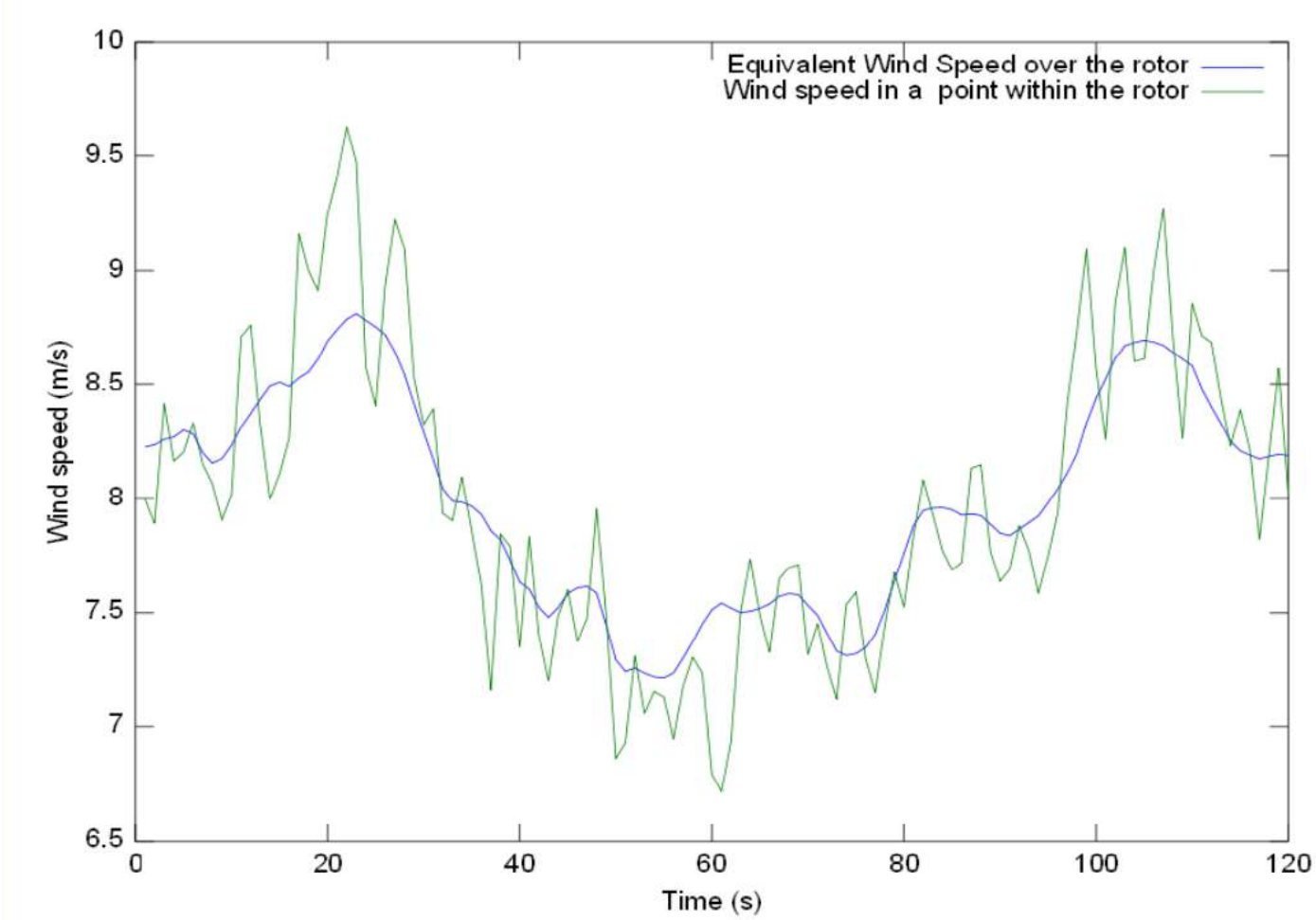

3500
3000
2500
2000
1500
1000
500
0
Solar PV generation (W)
Clear Skies
Passing
Cloud Cover
11-Jul-20
13-Jul-20
06:00
09:00
12:00
15:00
18:00
21:00
Time

SOLAR COMPARED TO DEMAND

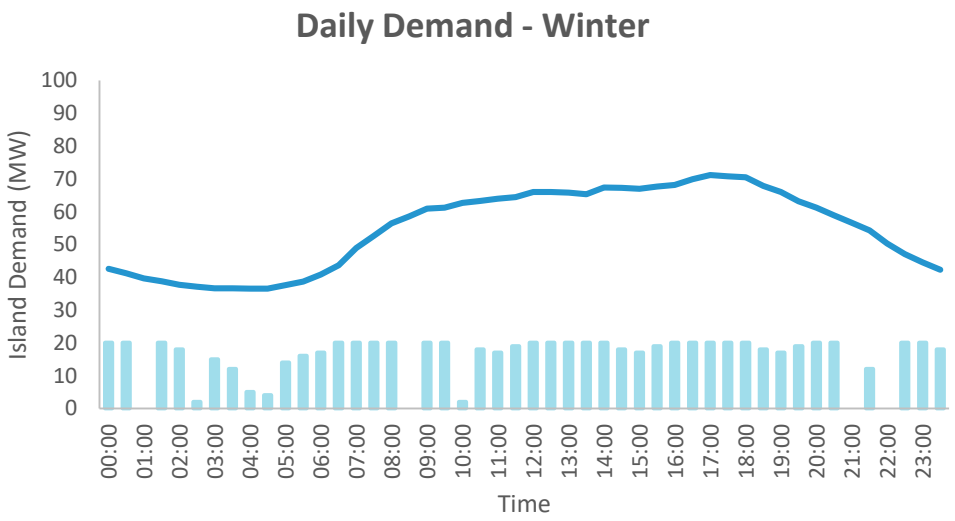


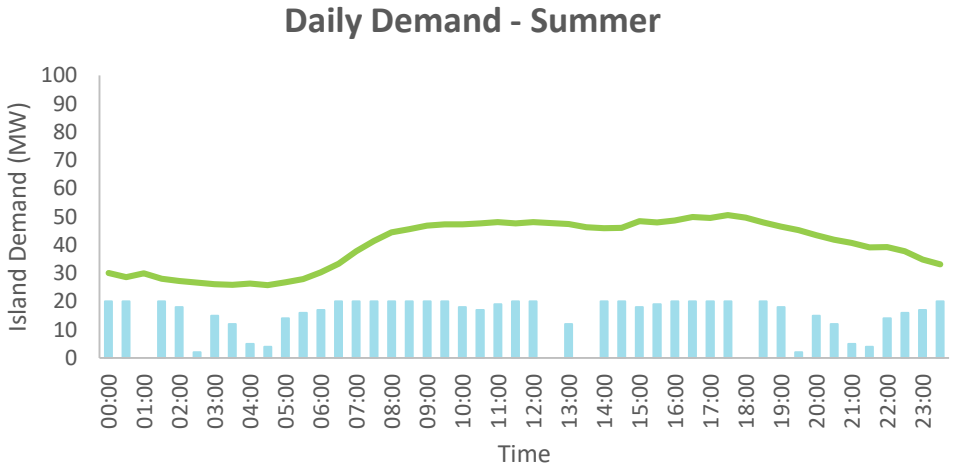


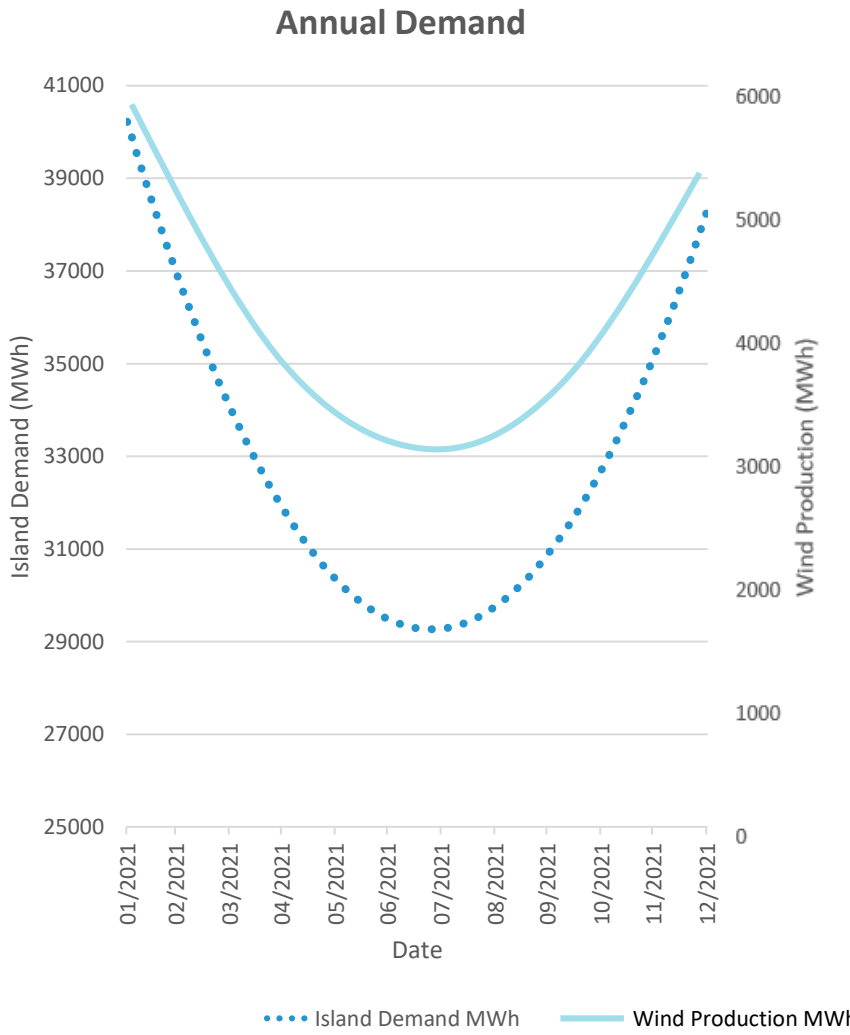



Equivalent Wind Speed over the rotor
Wind speed in a point within the rotor
Wind speed (m/s)
Time (s)
10
9.5
9
8.5
8
7.5
7
6.5
0
20
40
60
80
100
120

WIND COMPARED TO DEMAND







ONSHORE RENEWABLES UPDATES

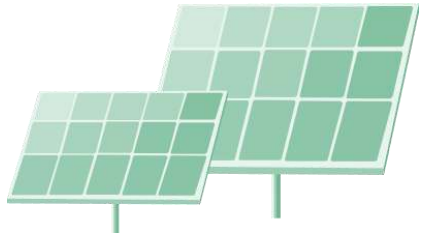
SITE SELECTION – Bureau Veritas, 2022

32
sites

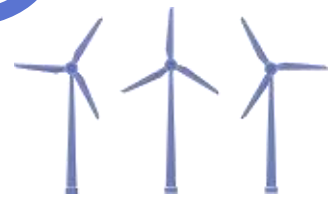
5

Solar sites
1 – 2 MW Each


3
Onshore Wind sites


Total solar capacity
30 MW

21
Solar sites
<0.5 MW Each

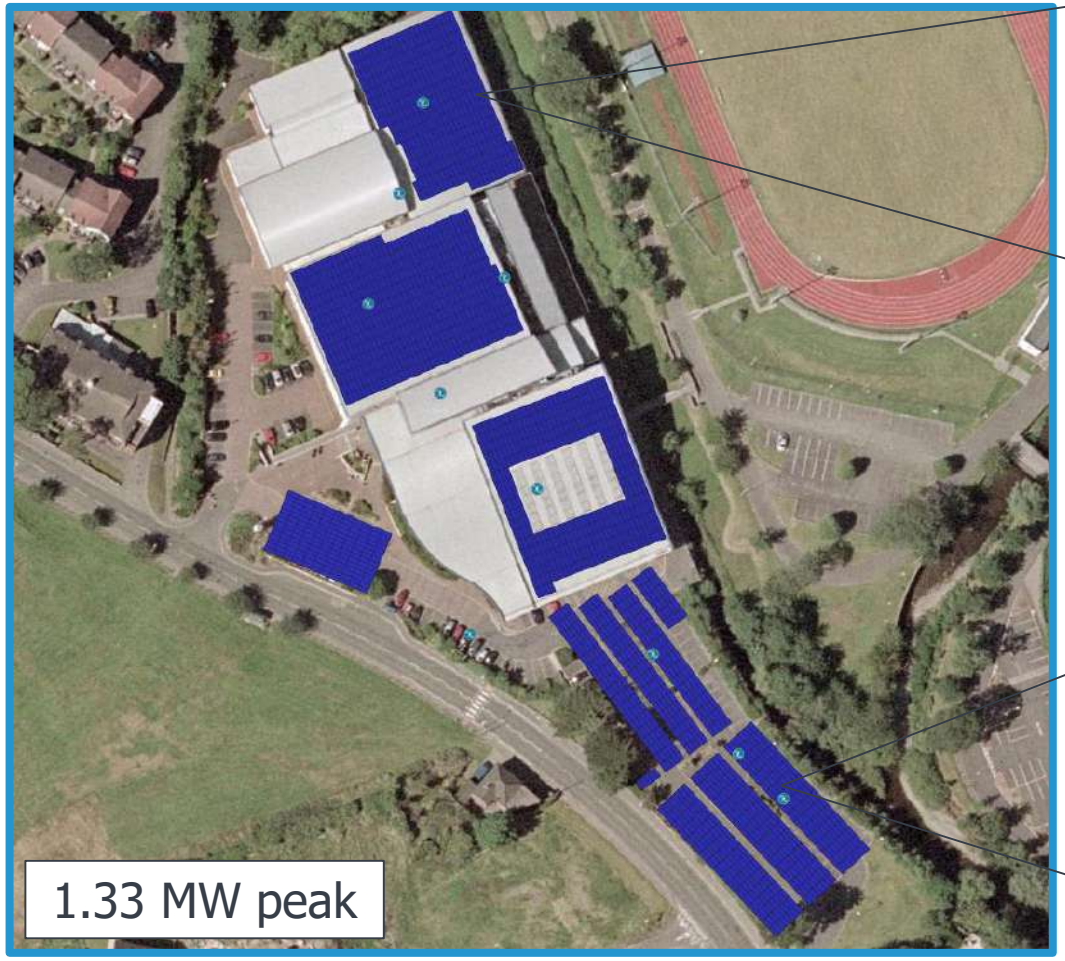
Total Wind Capacity
30 MW


SOLAR PROJECTS

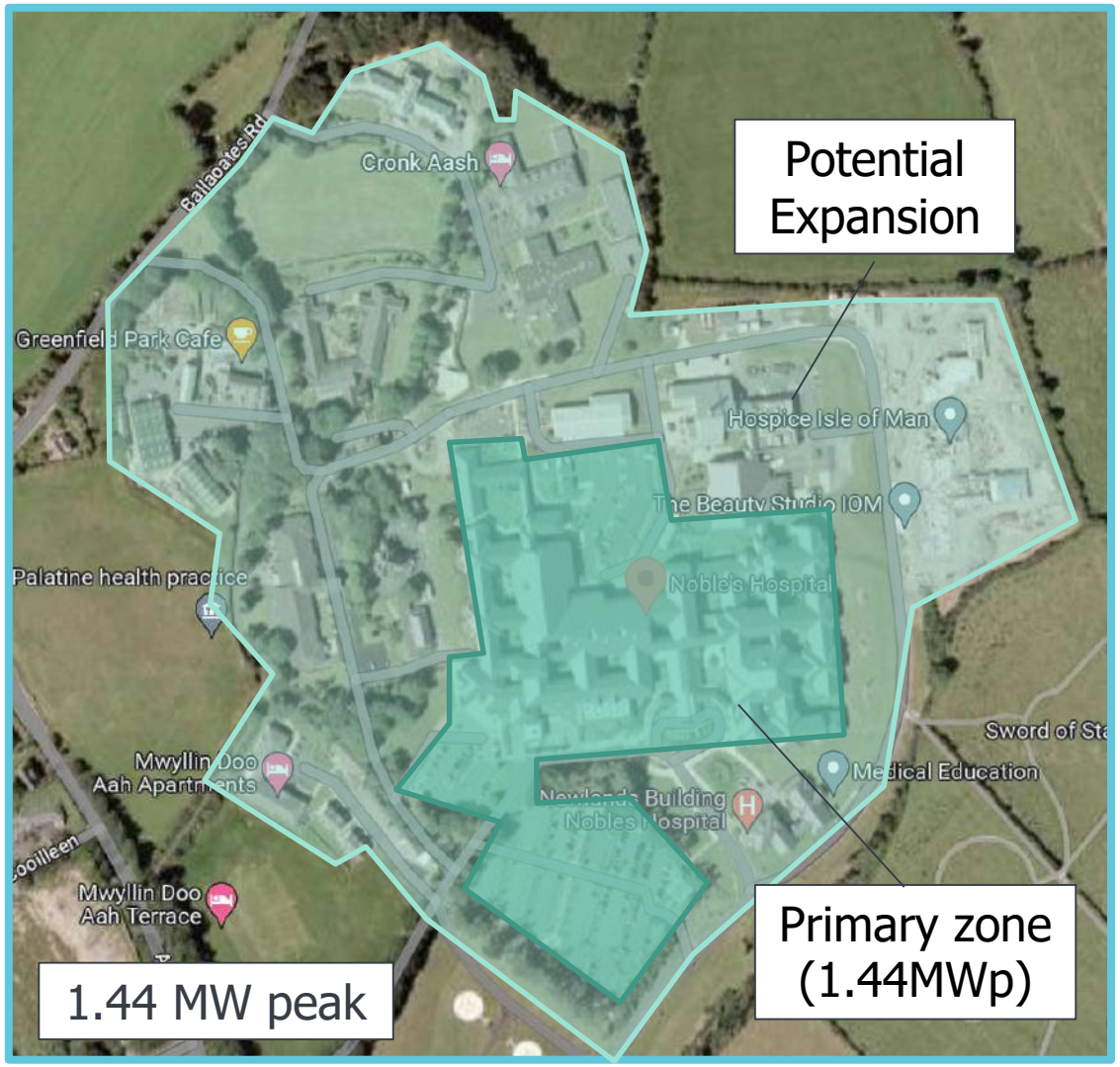
PROPOSED SOLAR SITES

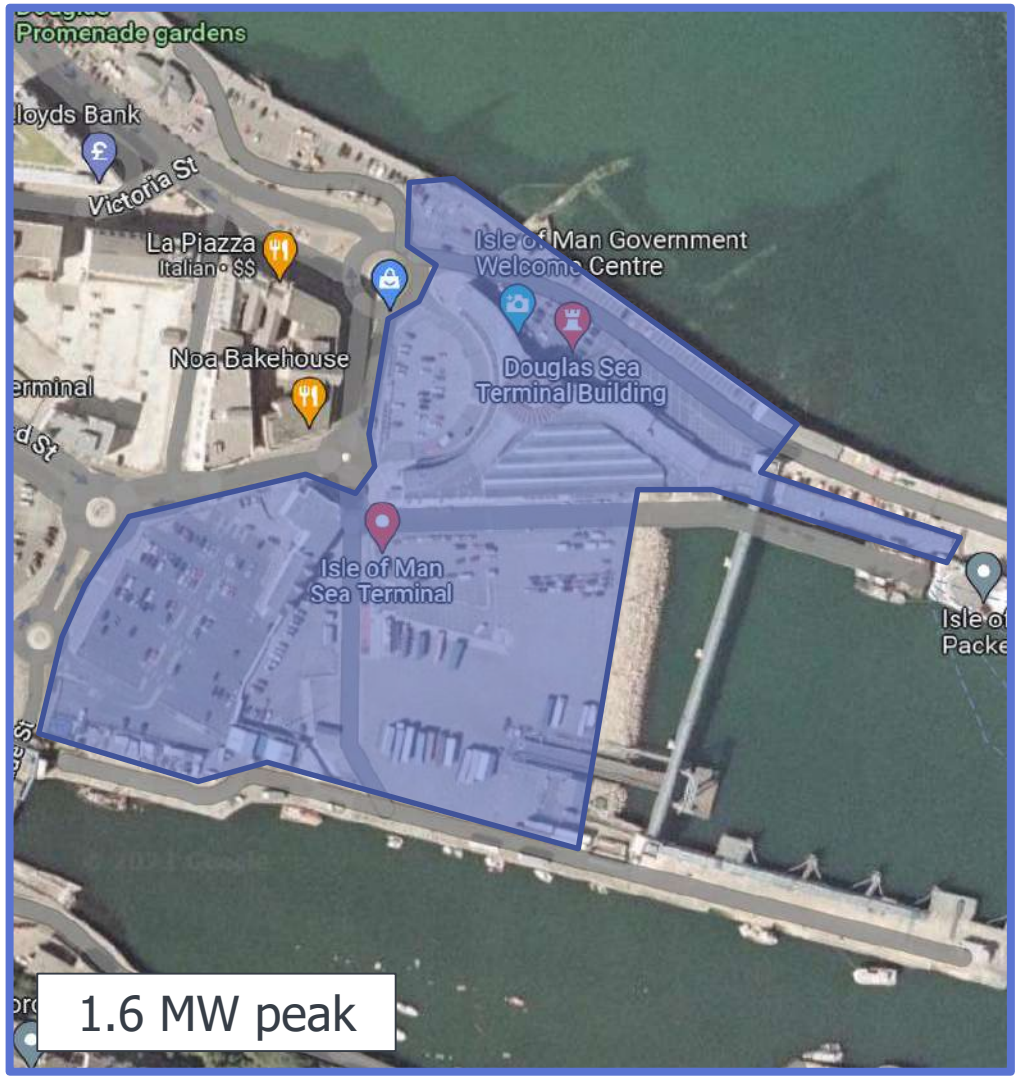
	LOCATION	MAX POSSIBLE CAPACITY	CUMULATIVE	BENEFITTING CUSTOMERS BY:
STAGE 1 2023	NSC NOBLES HOSPITAL SEA TERMINAL	1.3 MWp 1.4 MWp 1.6 MWp	4.3 MWp	2024
STAGE 2 2024	CENTRAL AND SOUTHERN SITES	5.7 MWp TOTAL	10 MWp	2025
STAGE 3 2025	NORTHERN AND CENTRAL SITE	6.2 MWp TOTAL	15 MWp	2026

STAGE 1 SITES – DOUGLAS



STAGE 1 SITES – DOUGLAS





ONSHORE WINDFARM PROJECT

SITE SELECTION – KEY CONSTRAINTS

- WIND SPEED
- NOISE
- ECOLOGY
- TOPOGRAPHY & ACCESS
- RADAR & AVIATION
- NETWORK ACCESS

Sites <6m/s limited economic benefit

Minimum distance of 500m between properties and windfarm

Impact assessment to establish the scope of mitigation

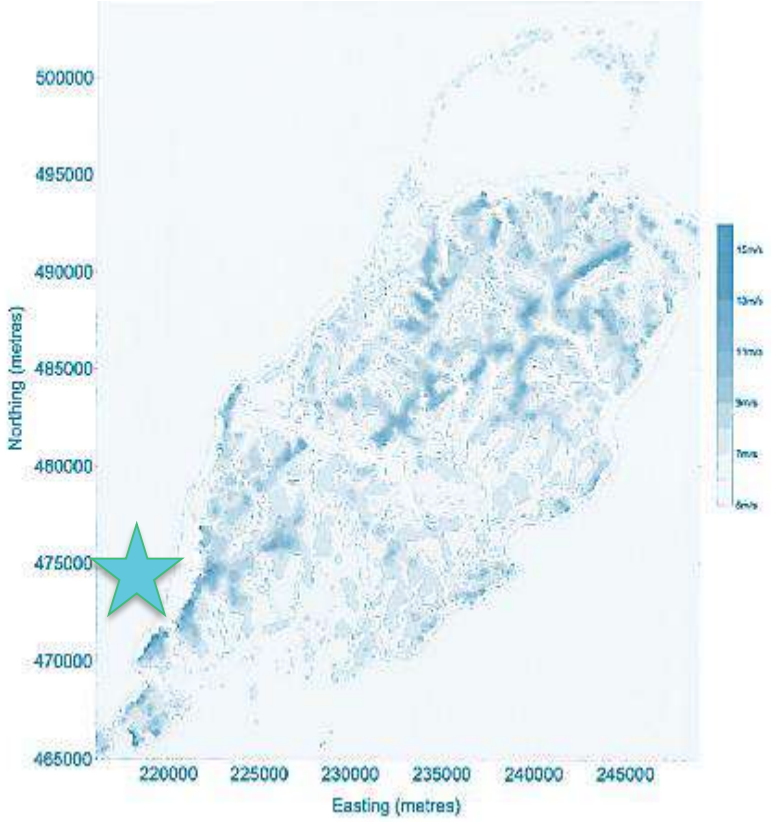
Some locations have no viable access route e.g. Snaefell. Limitations on the largest turbine that can be imported

Aviation is a key consideration. Issues should be resolvable.

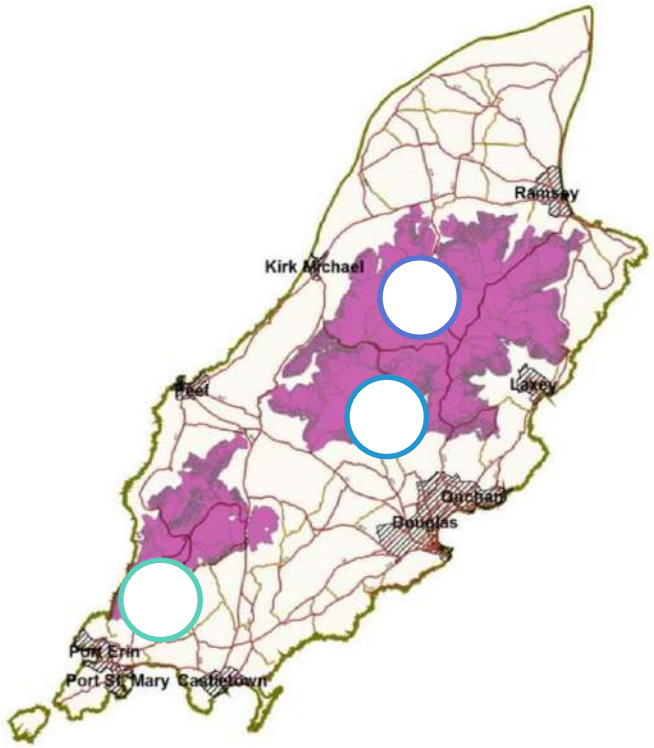
If significant cable route required or cable route passes through heathland, it becomes a hard constraint

SITE SELECTION – Wardell Armstrong, 2023

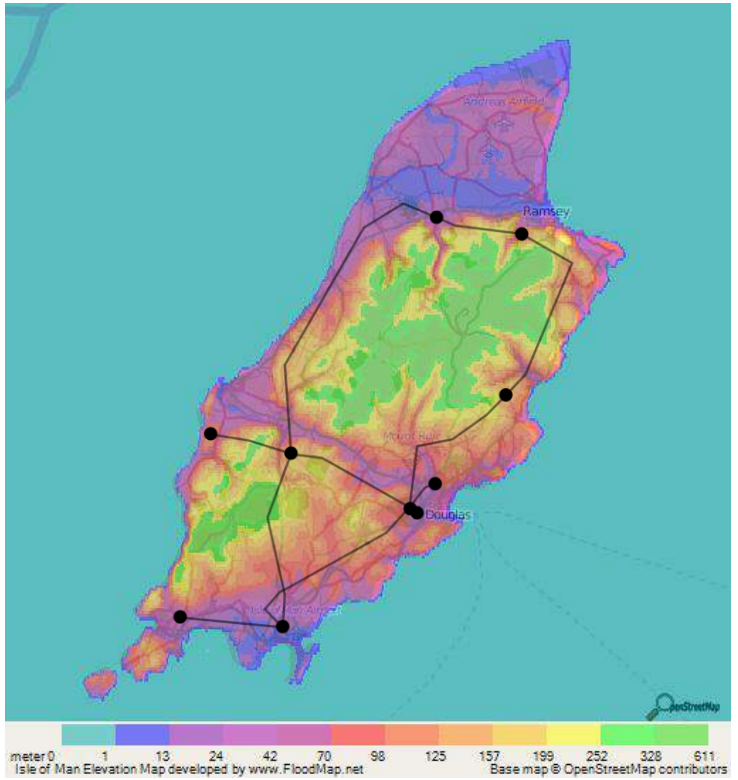
Map showing Average Wind Speeds Across the Isle of Man



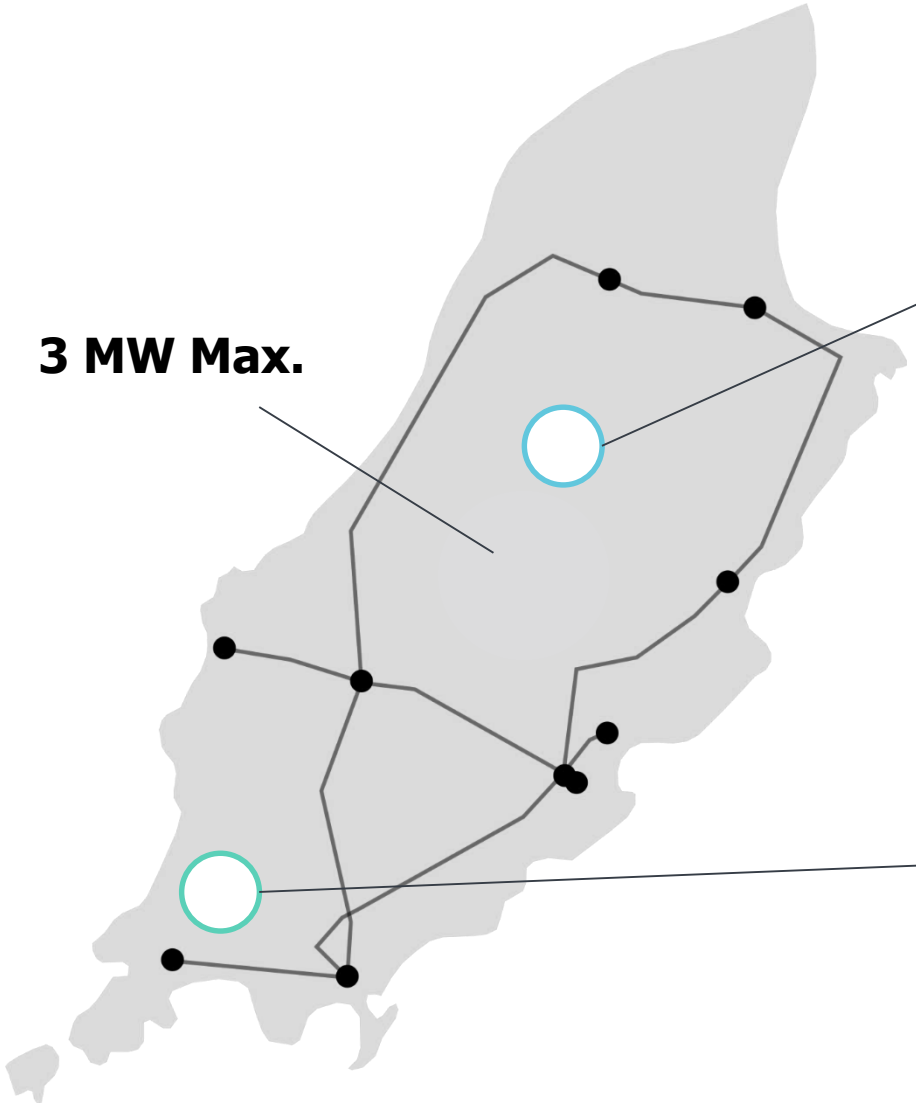
Map showing heathland across Isle of Man



LIDAR map for Isle of Man

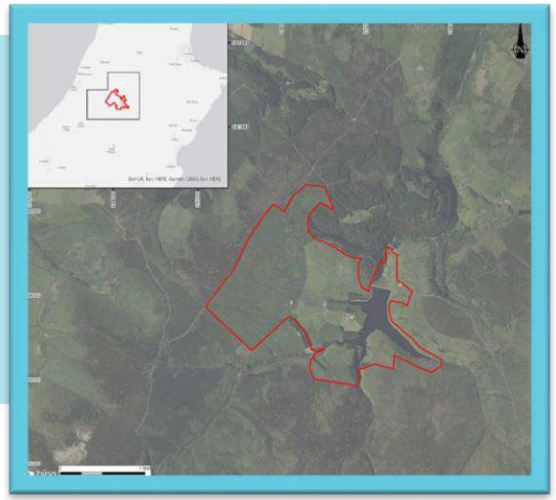


INDICATIVE COMPARISON OF SITES



Sulby & Druidale:

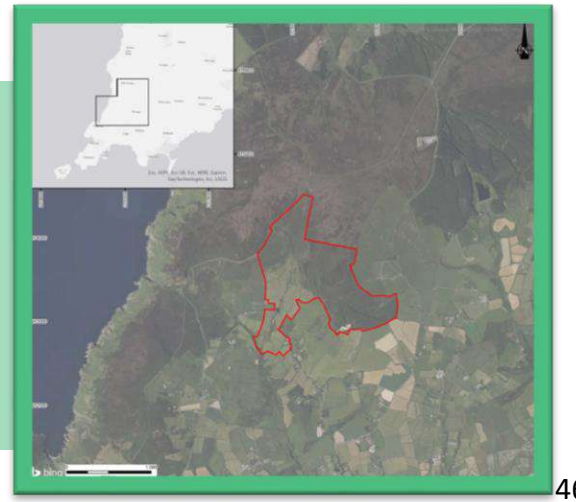
- 7 – 12 turbines
- 20MW +
- Wind speed 8.5m/s
- Annual Output 81 GWh
- c. 45 kT CO2(e)



Ecological and transport studies still to be finalised

Earystane & Scard:

- 4 – 5 turbines
- 20MW+
- Wind speed >10m/s
- Annual Output 105 – 130 GWh
- c. 60 – 74 kT CO2(e)



FUTURE ENERGY PLAN

FUTURE ENERGY: THE ENERGY TRISKELION

(1) Solving the Trilemma

Secure, affordable & reliable electricity for all customers. Delivered by interconnector, 30 MW onshore renewables and dispatchable generators

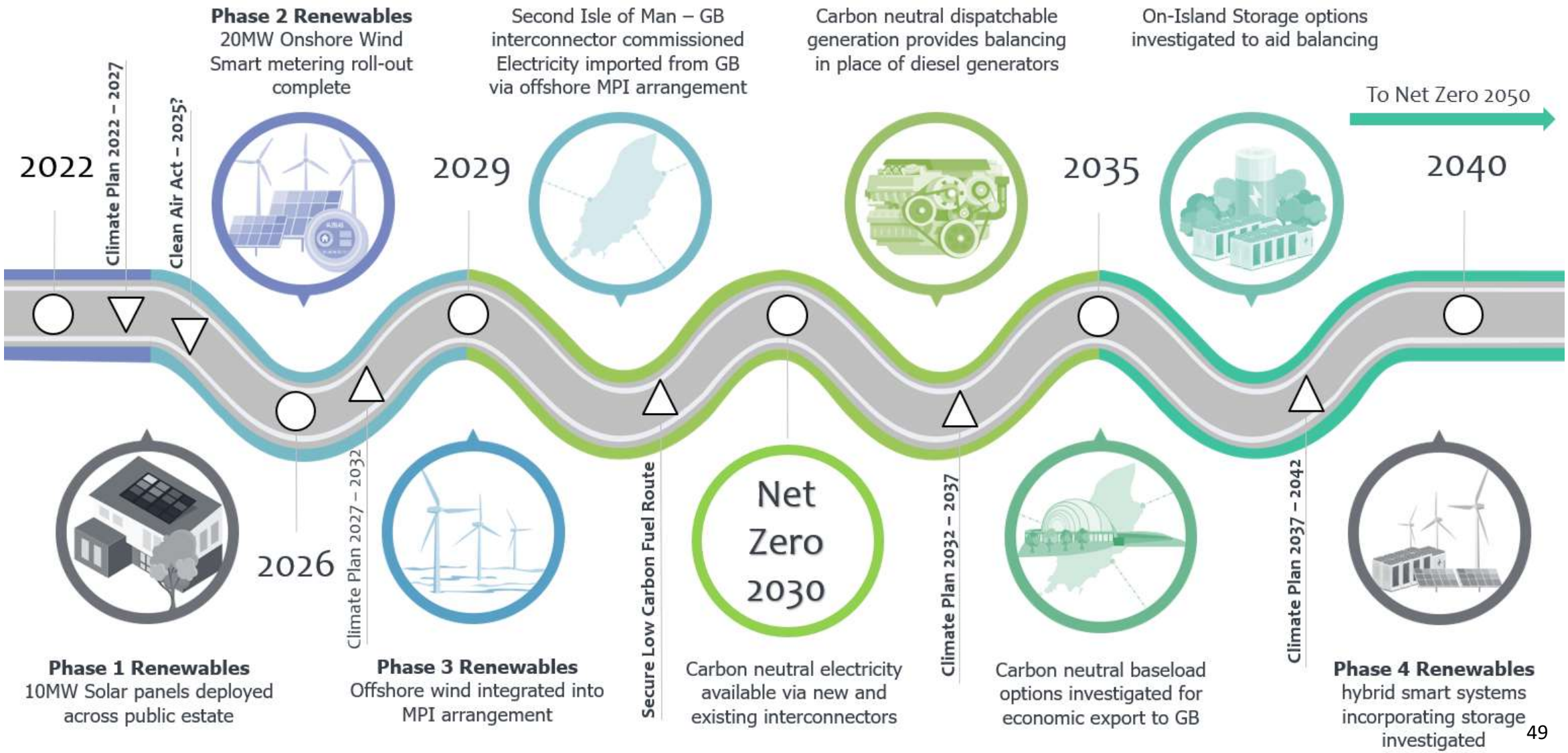
(2) Self-sufficiency

Offshore wind MPI boosts renewables to provide up to 90% of domestic electricity with 10% generated from on-demand generators

(3) Securing Opportunities

Developers identify route to market and export additional power to GB via interconnectors

ENERGY TRANSITION ROADMAP



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Welcome to the

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Building a better future together