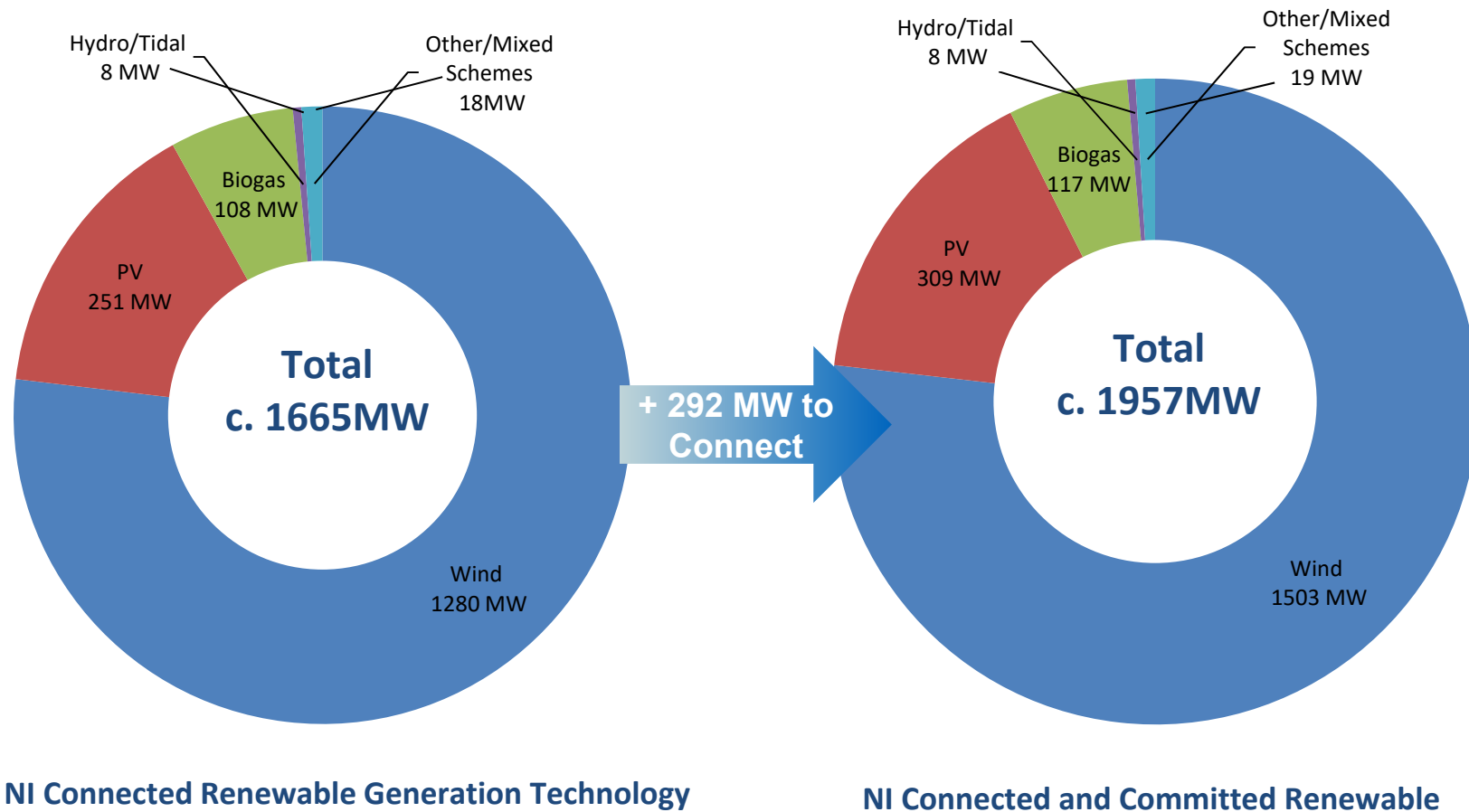


RENEWABLE STATUS UPDATE

RGLG 3rd December 2019



Renewable Generation Status – Q3 2019



A nighttime aerial photograph of a coastal city, likely San Francisco, viewed from a hillside. The city lights are reflected in the water of the harbor. The sky is a deep blue with some light clouds.

Transmission Application & Offers

RGLG

3rd December 2019



Transmission Applications & Offers

Project Name	Developer	MEC/MIC
Applications		
Aught Wind Farm	Aught Wind Farm Limited	37.2MW MEC
Pigeon Top Wind Farm	Energia Renewables Company 1 Limited	51.6MW MEC
Islandmagee Gas Storage	Costain Oil, Gas and Process Ltd.	34.75MW MIC
Offers Issued		
BPS 100MW BESA	EP Ballylumford Limited	100MW MEC & MIC
Atlantic Hub	Atlantic Hub Property Ltd.	100MW MIC
Curraghamulkin Wind Farm (also called Dooish)	DW Consultancy	42MW MEC
Belfast Power Limited	Evermore Energy	489.6MW
Drumkee Battery Storage	Drumkee Energy Limited	50MW MEC & MIC
Mullavilly Battery Storage	Mullavilly Energy Limited	50MW MEC & MIC
KPS 50MW BESA	EP Kilroot Limited	50MW MEC & MIC
Castlereagh 50MW BESA	Energia Renewables Company 1 Limited	50MW MEC & MIC
EP Kilroot GT5 and GT6 OCGT's	EP Kilroot Limited	2 x 205MW MEC



Consultation on Connecting Further Generation in Northern Ireland

RGLG 3rd December 2019

ACAOP

- The ACAOP process was implemented in June 2016 following consultation with industry. Following the influx of over 1600 MW generation applications to connect to the distribution system
- Offers issued for connection to the distribution system where there was both transmission and distribution system capacity available without the requirement for further reinforcement on the transmission system.
- With the majority of this transmission capacity* having now been assigned the continuation of this current approach will result in NIE Networks increasingly being unable to issue further distribution export offers.
- Connections Innovation Working Group formed to consider new approach

*with the exception of some remaining firm capacity in eastern areas of the system and at cluster substations

CIWG, ToR

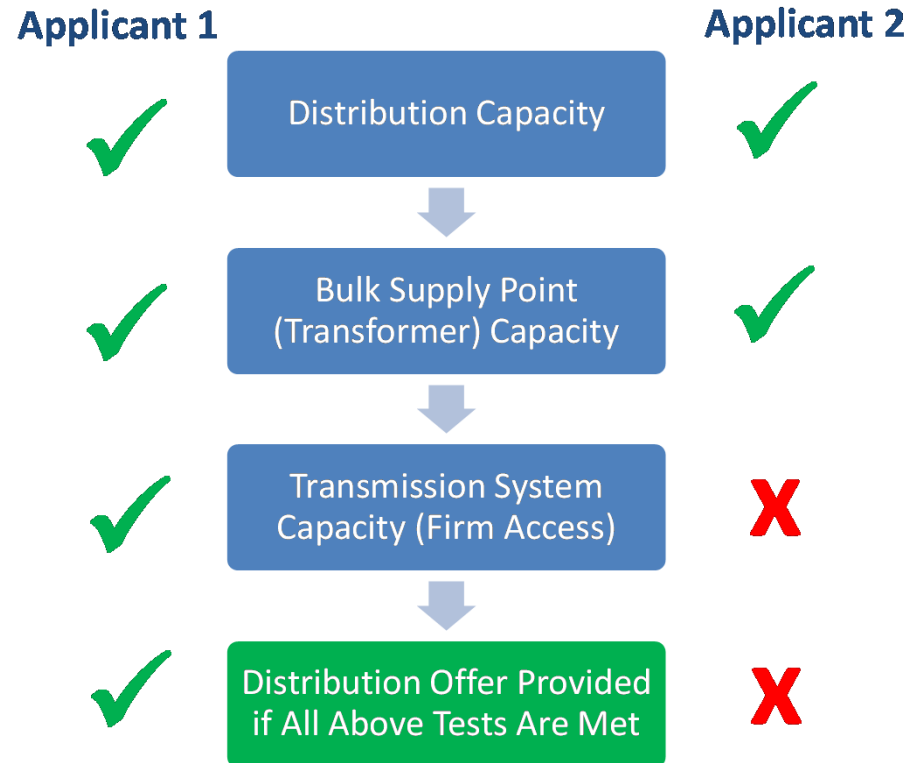
Aim

To consider and as appropriate progress solutions that facilitate the connection of further Distributed Energy Resources in Northern Ireland, which are technically and commercially feasible for the System Operators and for DER developers/operators of both new and existing projects.

Initial area of investigation

- The technical feasibility of allowing distribution connections to be made on a potentially permanent basis with zero FAQ
- The commercial viability for DER operators of new and existing projects
 - Constraint/curtailment information and forecasting;

Existing ACAOP Process – Offers only where Firm Capacity exists



Key Considerations

- Generators that have their output dispatched down due to curtailment are not compensated for their reduced output
- Curtailment is carried out pro rata on an all island basis
- No Grandfathering exists for curtailment – i.e. incumbent generation is not protected from curtailment
- Increases in the amount of uncontrollable generation i.e. SSG export and zero export likely to contribute to increasing levels of curtailment for LSG
- Reduction in overall system demand would likely contribute to increasing levels of curtailment for LSG

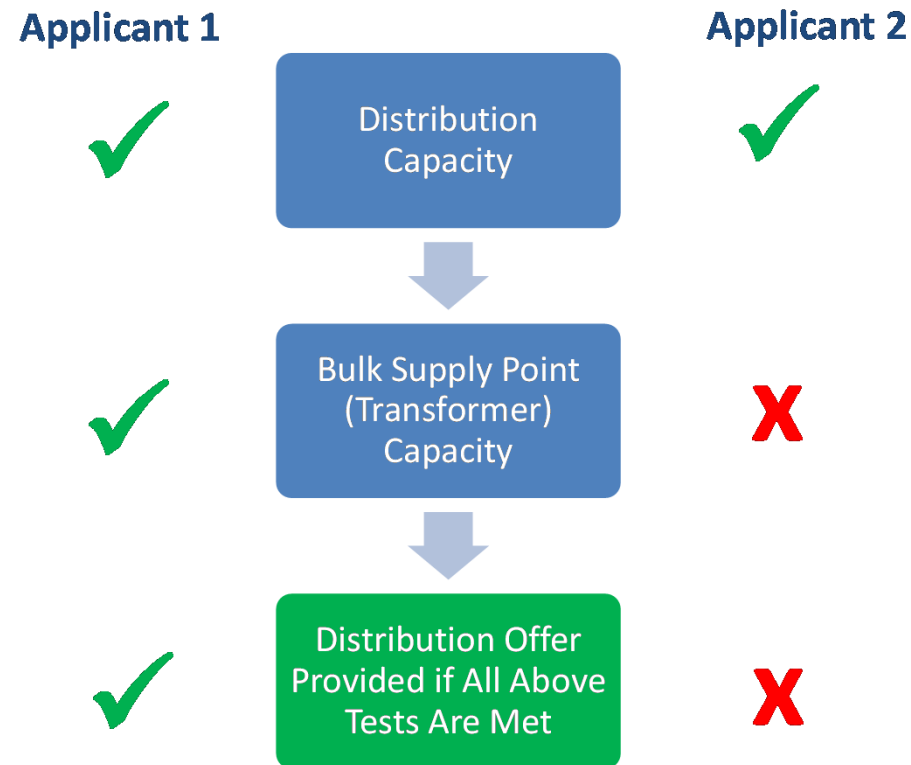
Consultation Options

- **Approach 1: Maintain Status Quo** - Maintaining the existing ACAOP process
- **Approach 2: NIE Network Issues Non-Firm Market Access Distribution Offers for Large Scale Generation (5MW and above)** – Offers issued provided there is transformer capacity
- **Approach 2A- NIE Network Issues Non-Firm Market Access Distribution Offers for Large Scale Generation (5MW and above) within an agreed MW limit** – Offers issued provided there is transformer capacity and within an agreed total RES limit

Key points from technical studies

- Constraints will increase particularly if generation locates in the west
- Constraints improve if the network is reinforced or if demand increased in the constrained area
- Curtailment is not paid for or grandfathered
- In particular at times of low system demand if SONI control room can't switch off uncontrollable generation this can impact on system stability and also increase curtailment of large scale generation
- New SSG export applications may need to be made controllable following further review

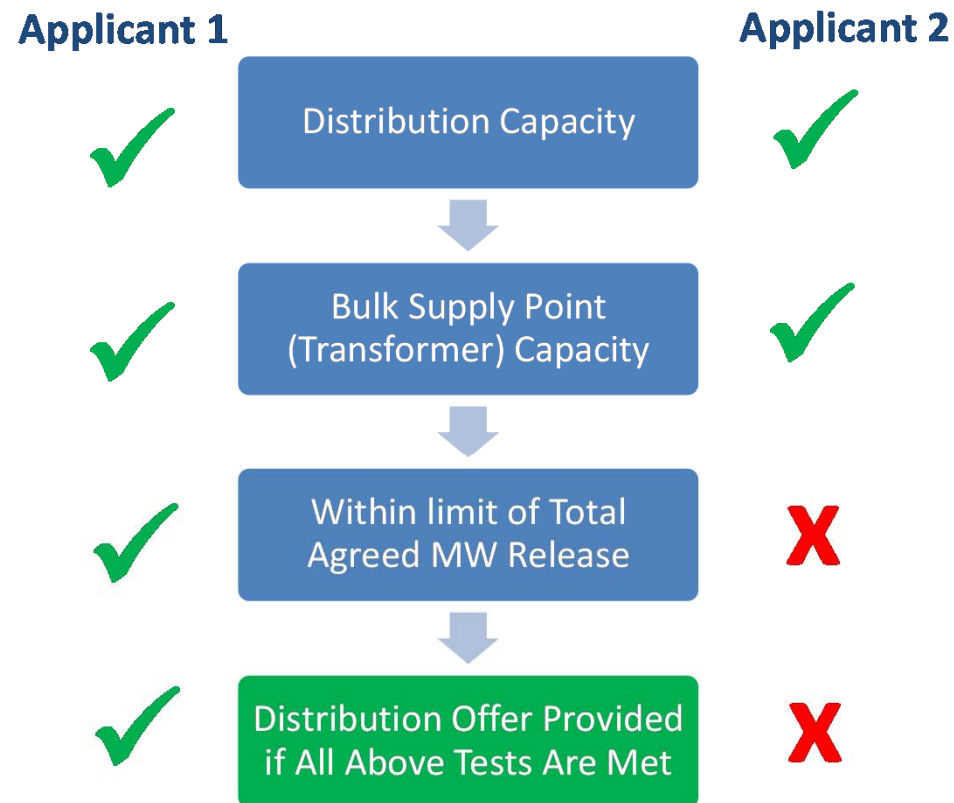
Approach 2: NIE Network Issues Non-Firm Market Access Distribution Offers for LSG ($\geq 5\text{MW}$)



Approach 2

Advantages	Disadvantages
NIE Networks will be able to issue a significant volume of distribution offers	Could lead to a high volume of applicants. This could have a significant impact on curtailment and constraints on both new generators and those generators already connected
Distribution connection offers will be issued regardless of location (i.e. east and west) provided bulk supply point capacity is available.	Absence of new energy policy presents uncertainty around the approval of further system reinforcements
Greater parity between applicants to SONI for transmission connections and NIE Networks for distribution connections	Applicants will still be refused due to lack of capacity at distribution level or transformer capacity at transmission level
Industry can maintain momentum with delivering controllable generation projects ahead of new Energy Policy	

Approach 2A- NIE Network Issues Non-Firm Market Access Distribution Offers for LSG ($\geq 5\text{MW}$) within an agreed MW limit.



Approach 2A

Advantages	Disadvantages
NIE Networks will be able to issue a significant volume of distribution offers	Offers issued may increase the impact on curtailment and constraints on both new generators and those generators already connected.
Distribution connection offers could be issued with consideration to some additional defined criteria e.g. location (i.e. east and west)	Applicants will still be refused due to lack of capacity at distribution level or transformer capacity at transmission level
Greater parity between applicants to SONI for transmission connections and NIE Networks for distribution connections	This limit may be reached quickly if they are large MW transmission applicants apply.
Industry can maintain momentum with delivering controllable generation projects ahead of new Energy Policy	Uncertainty in managing the risk or lost opportunity in predicting a potential new RES-E target.
Limit provides some longer term protection around the level of constraint and curtailment level experienced	

Next Steps

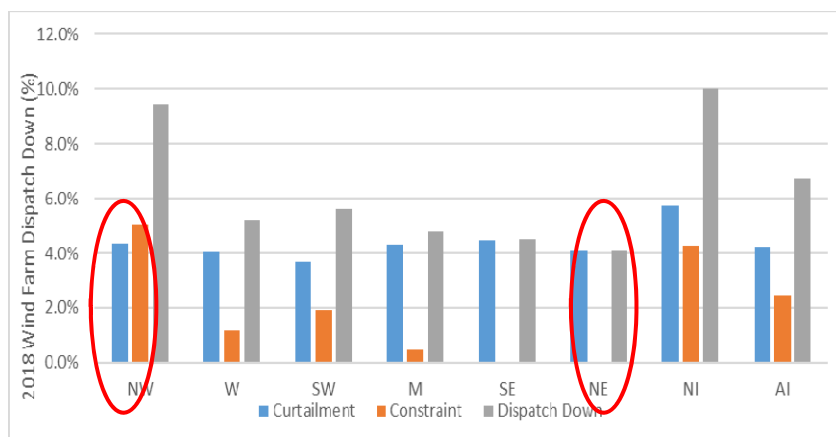
Key Milestones	Proposed Dates
Consultation Release	December 2019
Consultation Workshop	Mid-January 2020
Consultation Close	February 2020
Decision Paper	Spring 2020

All-island Dispatch Down in Numbers



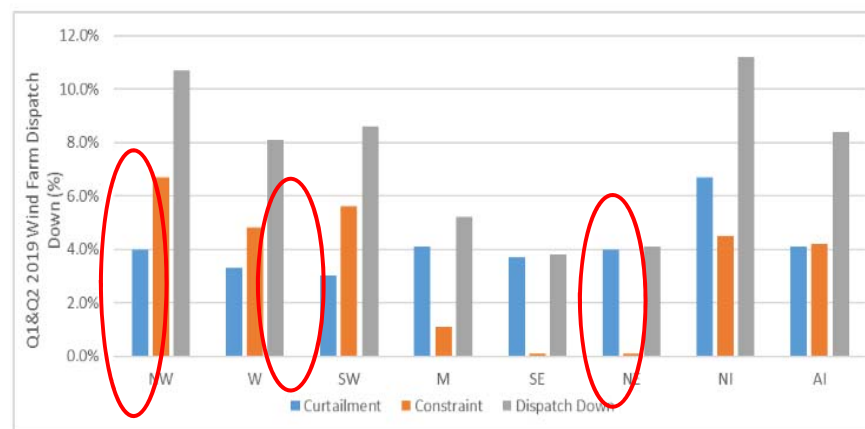
2018

Dispatch Down Energy	700 GWh
Increased emission	350 kt CO ²
% of Total Energy/Emissions	2%
Lost Revenue	€50m
Curtailment %	4.2%
Constraint %	2.5%



Q1-Q3 2019

Dispatch Down Energy	694 GWh
Increased emission	377 kt CO ²
% of Total Energy/Emissions	2.7%
Lost Revenue	€53m
Curtailment %	4.1%
Constraint %	4.2%





Update on TDPNI

RGLG - 2 December 2019



Transmission Development Plan NI 2019-2028

- Out for consultation until 19 December
- Updated version of TDPNI 2018
- Includes long list of projects SONI think may be required in next 10 years
- Project list also included in SONI price control
- To be consulted on by UR in early 2019 before finalisation
- **Projects will be advanced individually and some will be dependent on future energy policy**

Tomorrows Energy Scenarios Northern Ireland

RGLG

Tuesday 3rd December 2019





Statutory and Licence Framework



Licence change - TDPNI

- **Condition 40**
 - *Reasonable endeavours to prepare and publish a TDPNI*
 - *Form approved by authority*
 - *Existing and forecast supply and demand*
 - *Publicly consulted relevant stakeholders*
- **Content**
 - *Reinforcement requirements over next ten years*
 - *Includes projects already approved*
 - *Timeframe and estimates for projects in next three years*
 - *Reasonable number of future scenarios*
- **Strategic Environmental Assessment**
 - *Environmental Assessment of Plans and Programmes Regulations Northern Ireland (2004)*
 - *By default no less than once in five years with environmental appraisal report intermediate years.*

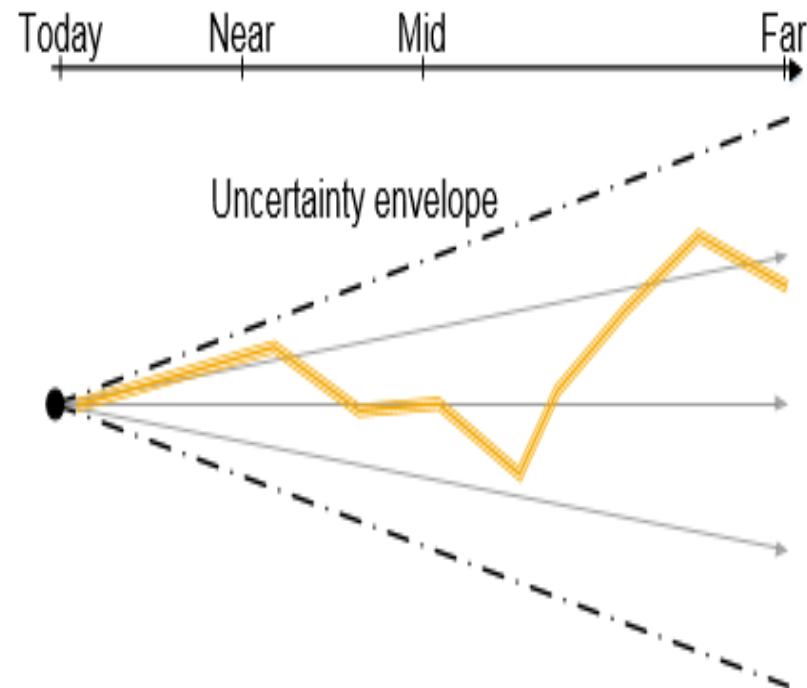


Scenarios within TDPNI

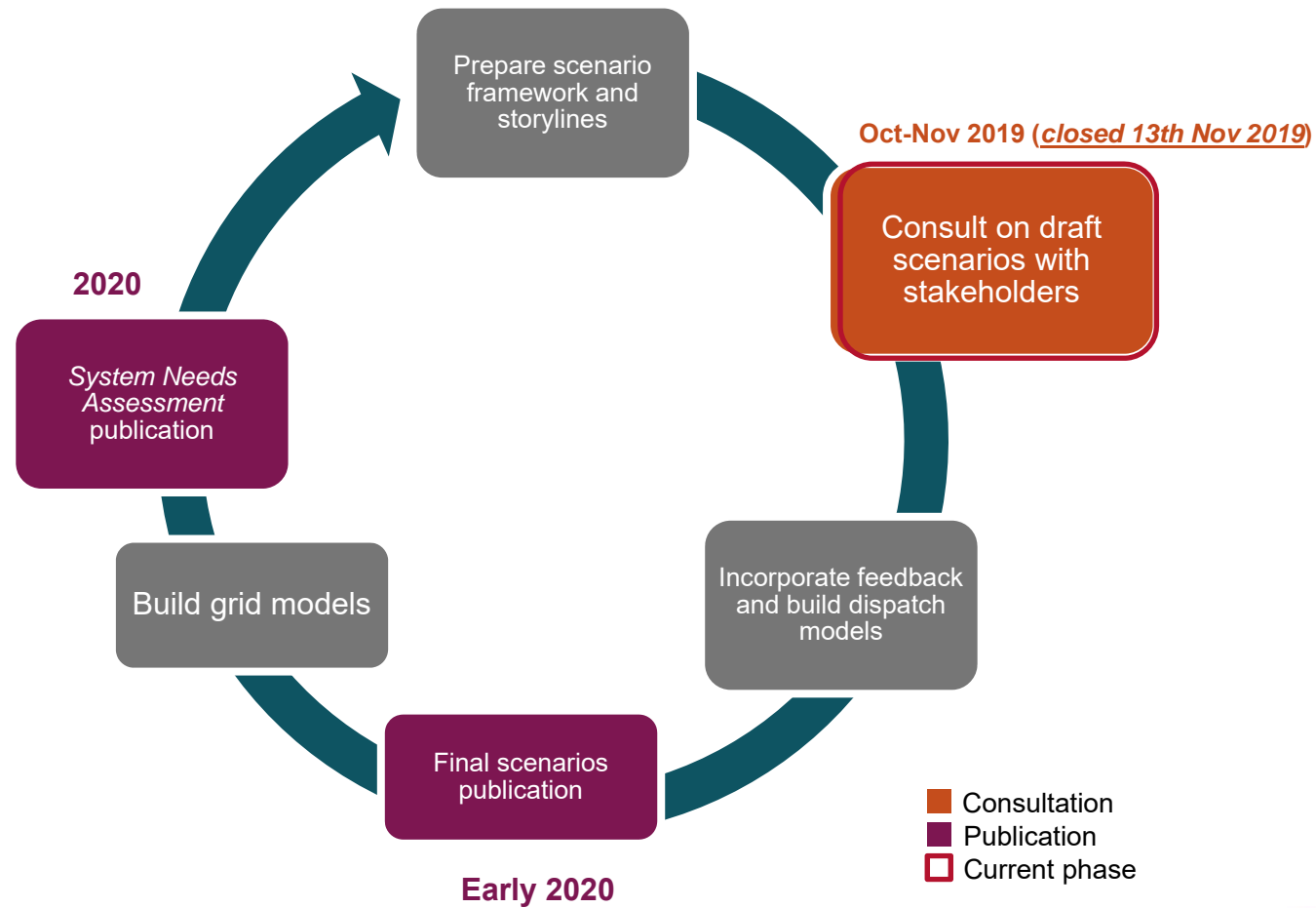
- Current TDPNI is based on pre-established demand forecast
- Several projects included, as long list of options, to reflect uncertainty around renewables targets
- TDPNI 2019-2028 mainly update of dates, costs, further information etc.
- TDPNI 2020-2029 will begin to consider scenarios

Purpose of TES

- Identify long-term needs on the electricity transmission grid.
- Inform the energy and climate policy debate, focusing on the electricity system.
- Enables decision making where uncertainty exists with analysis techniques such as “**least worst regret**”.



TESNI Development Cycle



The image features a solid blue background with a subtle gradient. Four paper airplanes are depicted. Three are white and positioned on the left side, each with a vertical dashed white line extending downwards from its base. The fourth airplane is yellow and is located to the right of the white ones. A dashed white line extends from its base, curving upwards and to the right. The text "Setting the scene for scenarios" is written in white, bold, sans-serif font across the lower portion of the image.

Setting the scene for scenarios

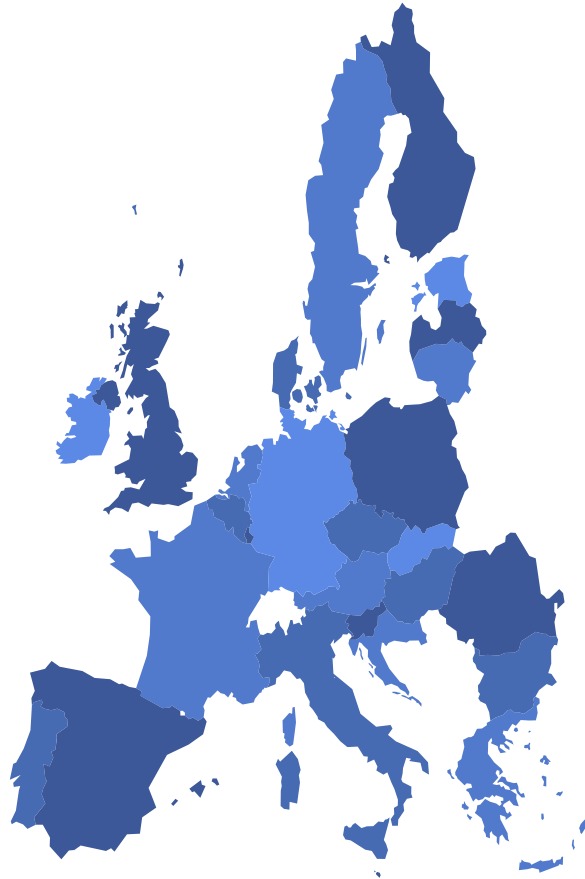


Climate Change Act 2008



- Advice
- Amendment
- Action

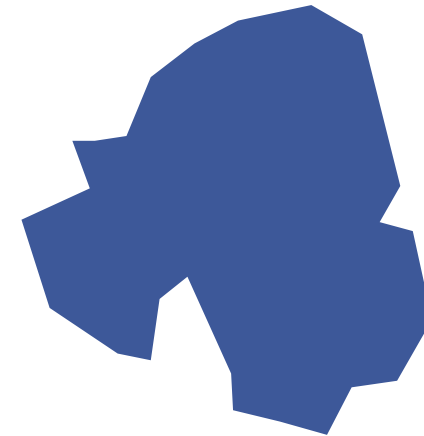




Net zero by 2050?
European
Commission
National Energy
and Climate Plans

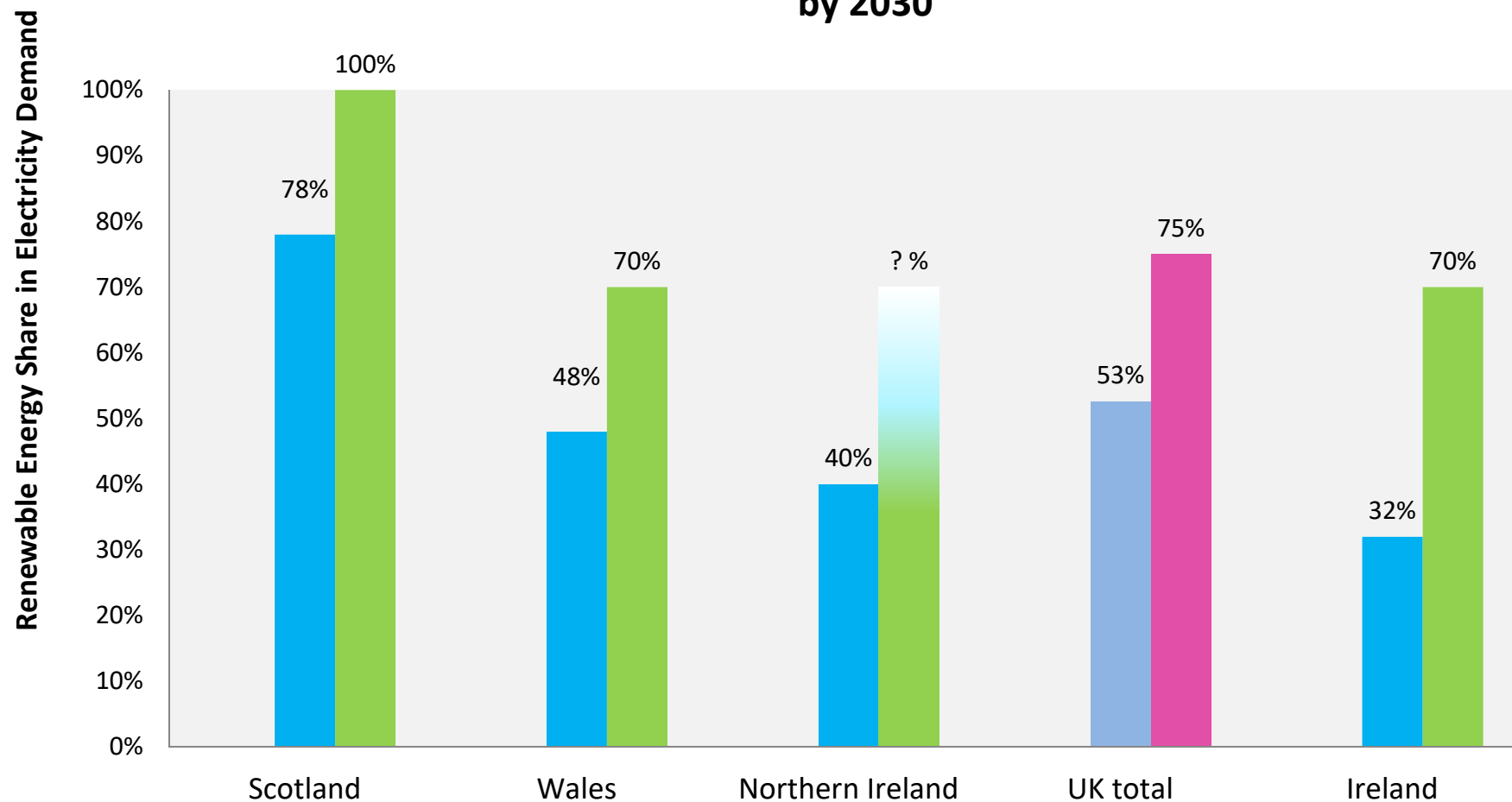


Net zero by 2050
UK Climate Change Act 2008



**Northern Ireland's
contribution?**

Recent achievements and future ambitions for renewable electricity by 2030



NOTE: SCOTLAND have a target of 100% Renewable Electricity by 2030

NOTE: UK figure includes all low carbon generation types

■ Current RES-E Share ■ 2030

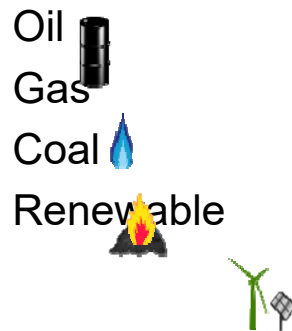


Scenarios



Overall Energy Slide Explainer

- Primary Energy Mix



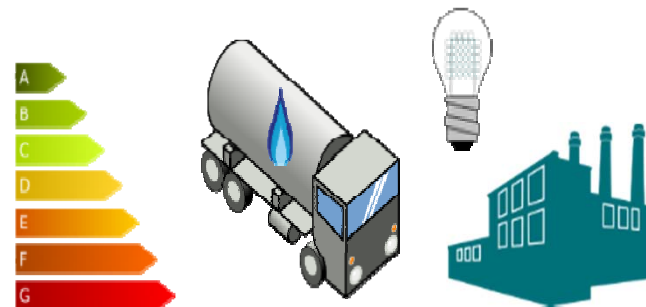
- Reduction in Greenhouse Gas from 1990



- Primary Energy Renewable Share

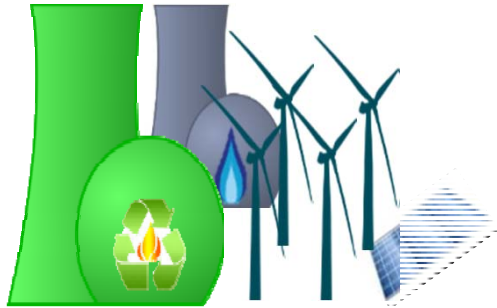


- Final Energy Use Mix

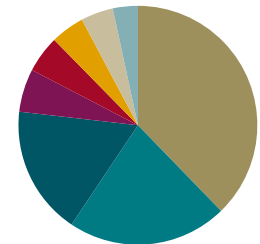


Electricity Sector Slide Explainer

- **Installed Capacities 2030**

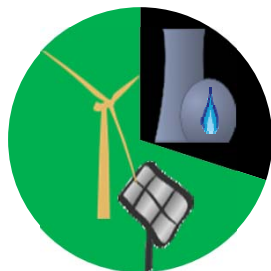


- **Generation Output 2030**



Annual Energy (TWh)
By Technology

- **Renewable Electricity Share**



- **Final Energy Use Electricity**



Draft Scenario 1 Least Effort

- **50%** Renewables
- **35%** Reduction in CO₂

Restricted growth in renewables alongside diversification with growth in onshore wind and solar PV

Switching away from domestic oil-fired boilers is restricted due to cost

Electric vehicles only reach 10% share due to costs and range anxiety



Disclaimer: These are draft scenarios until consultation process is complete.

Draft Scenario 2 Modest Progress

- **60%** Renewables
- **40%** Reduction in CO₂

Significant decarbonisation in generation as new policies and cost reductions lead to growth in onshore wind and solar PV

Domestic insulation improves; 1 in 4 adopt heat pumps – both driven by new builds and renovations

Increased demand for EVs due to positive economy



Disclaimer: These are draft scenarios until consultation process is complete.

Draft Scenario 3

Addressing Climate Change

- **70%** Renewables
- **45%** Reduction in CO₂

Diverse renewable generation mix: Growth in offshore wind, tidal, solar PV and onshore wind.

Low-carbon technologies adopted widely

Carbon capture technologies contribute to reduced emissions

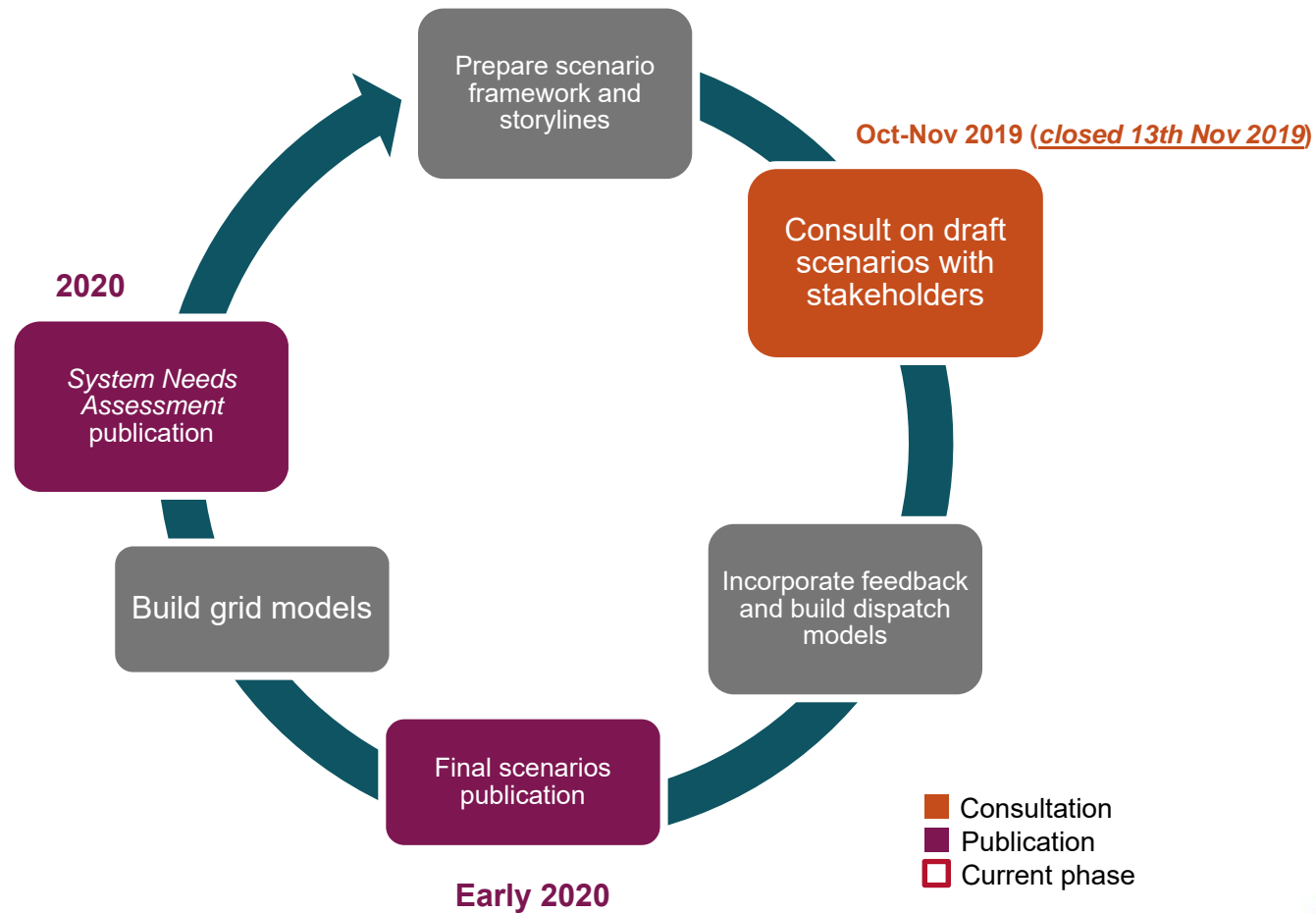


Disclaimer: These are draft scenarios until consultation process is complete.

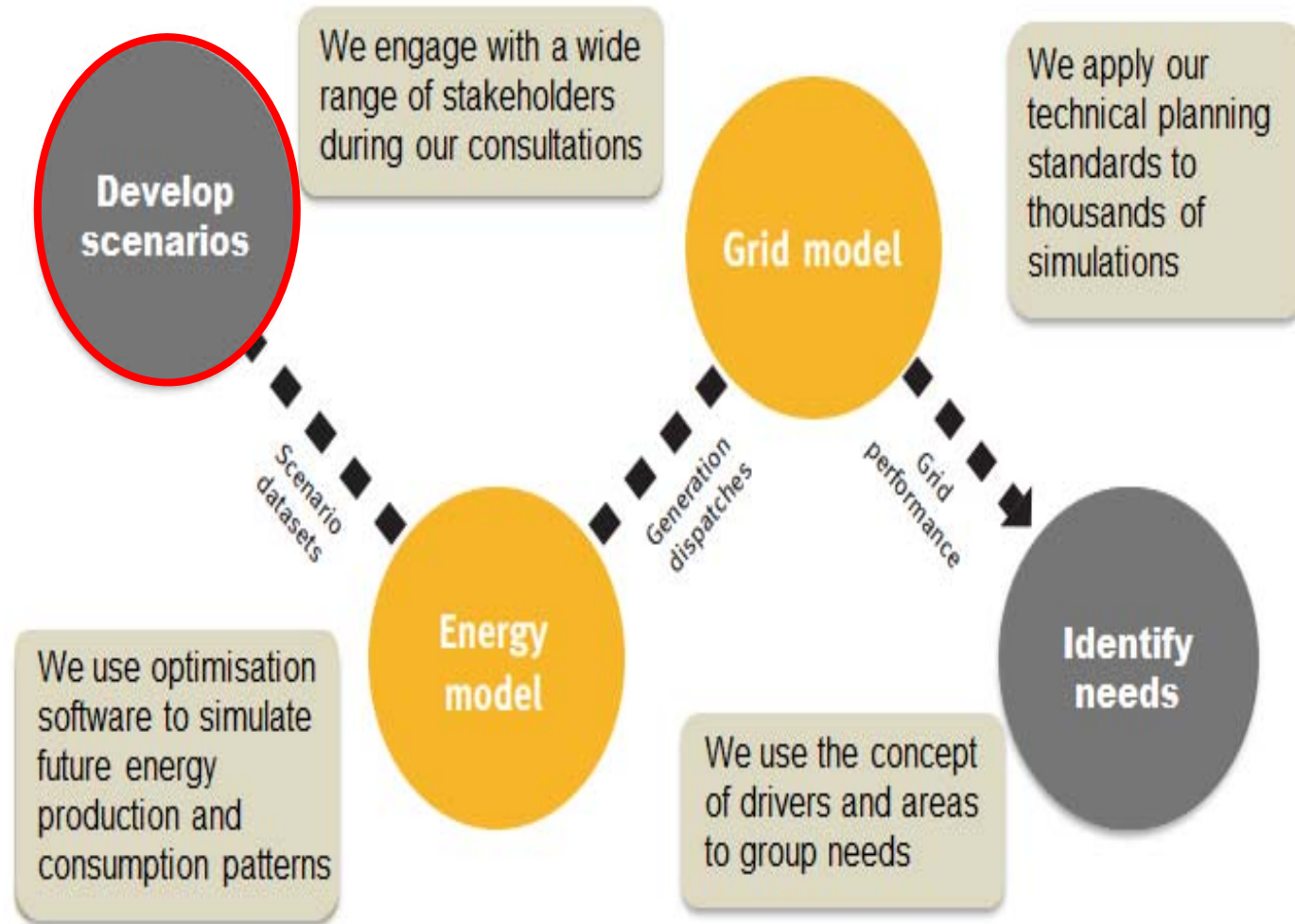


Next Steps and Tools

TESNI Development Cycle



System Needs Assessment



System Needs Example

Driver

Integration of
renewable energy
generation

Need

Power transfer capacity
Voltage support



For illustrative purposes only

A silhouette of a person carrying a child on their shoulders, with both having their arms outstretched. They are positioned against a bright, hazy sunset sky with the sun low on the horizon, creating a strong backlight effect. The person is wearing a dark long-sleeved shirt and dark pants, while the child is wearing a light-colored short-sleeved shirt.

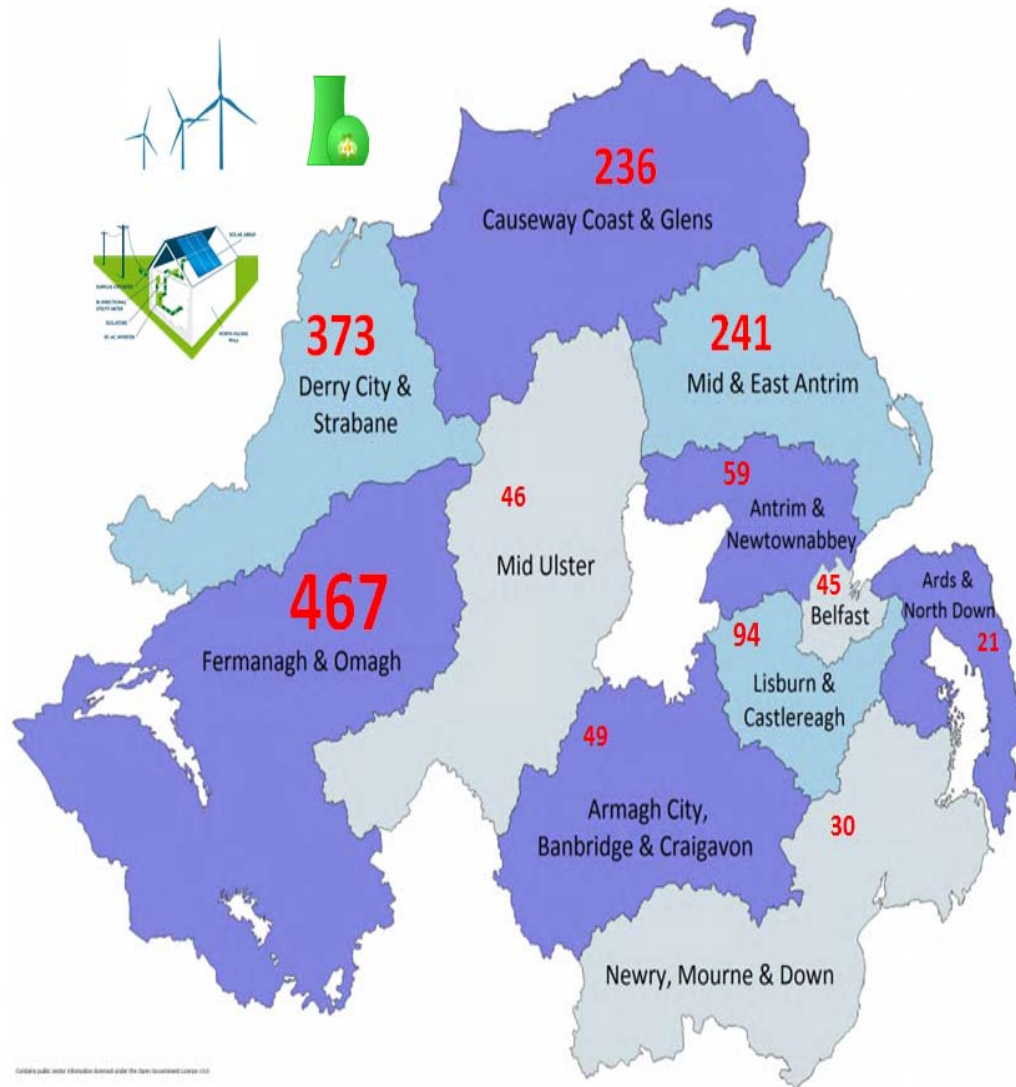
Locations



Council Area Breakdown



Installed Capacity of Connected RES Generation (MW)

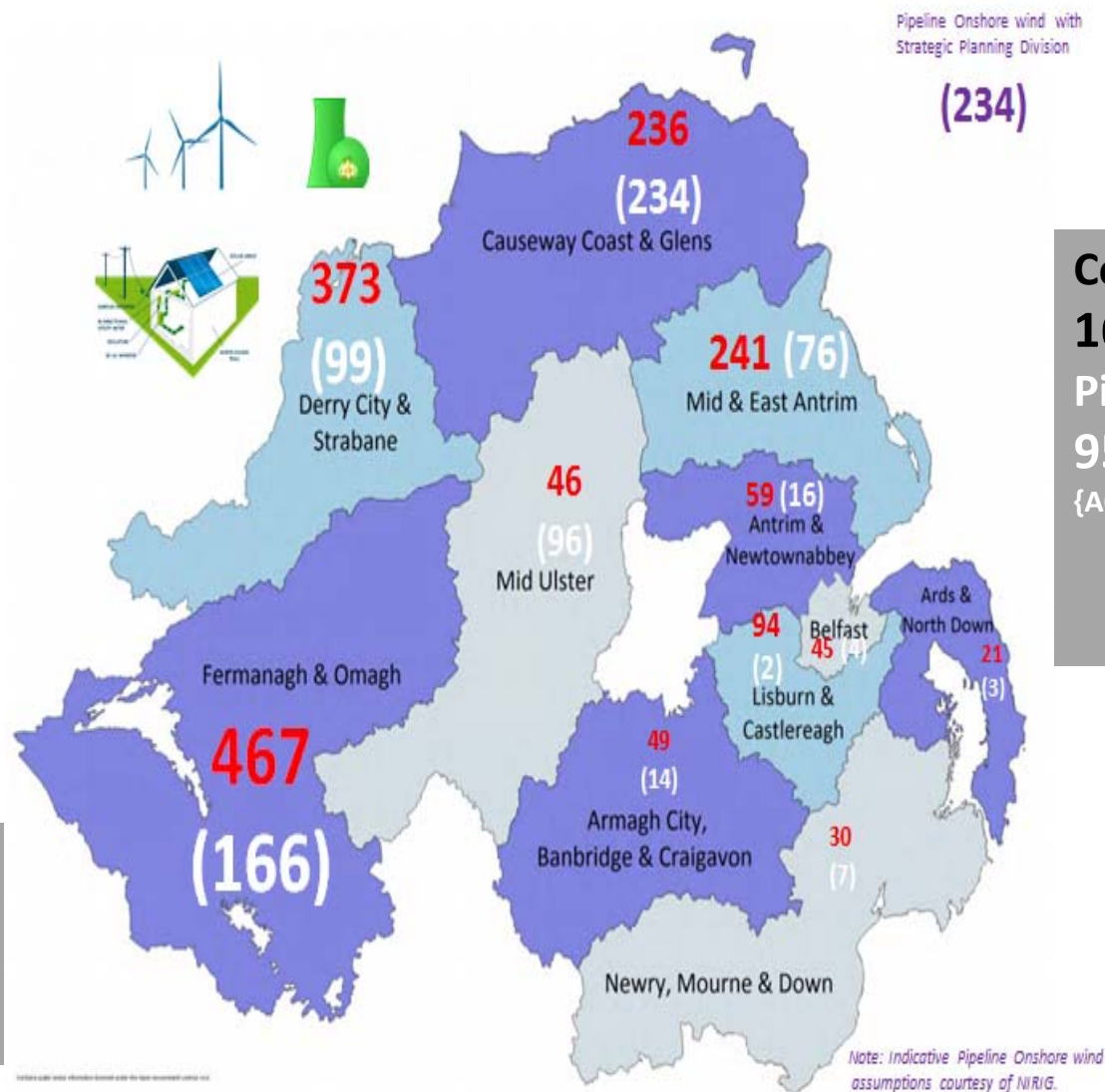


Connected (all RES-E)
1662 MW

Legend
241 - Connected



Installed Capacity of Connected RES Generation & Pipeline Onshore Wind (MW)



Connected (all RES-E)

1662 MW

Pipeline (onshore Wind only)

954MW

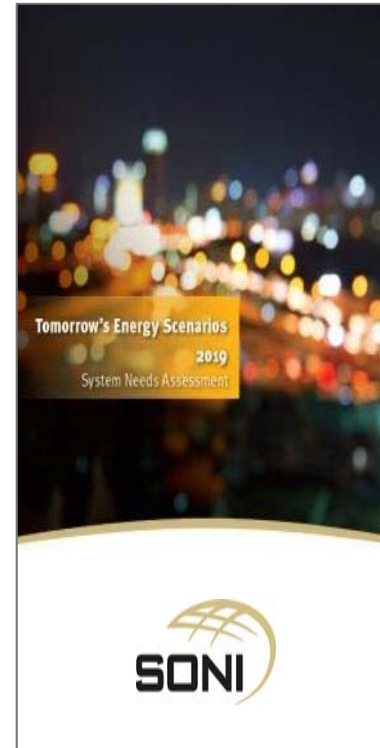
{ACC 2040 requires +990MW}



Upcoming Reports



Early 2020



2020





Thank you



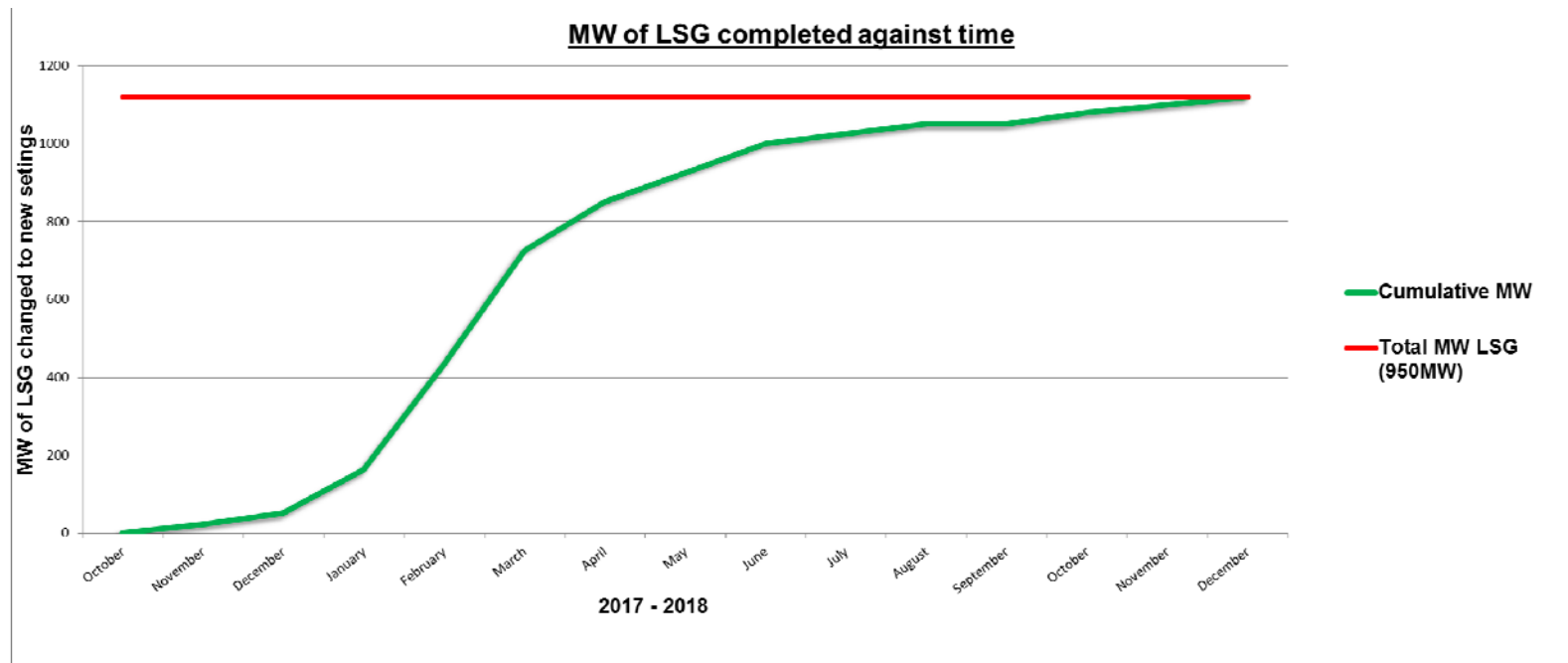
ROCOF IMPLEMENTATION PROGRAMME

Update 03/12/19



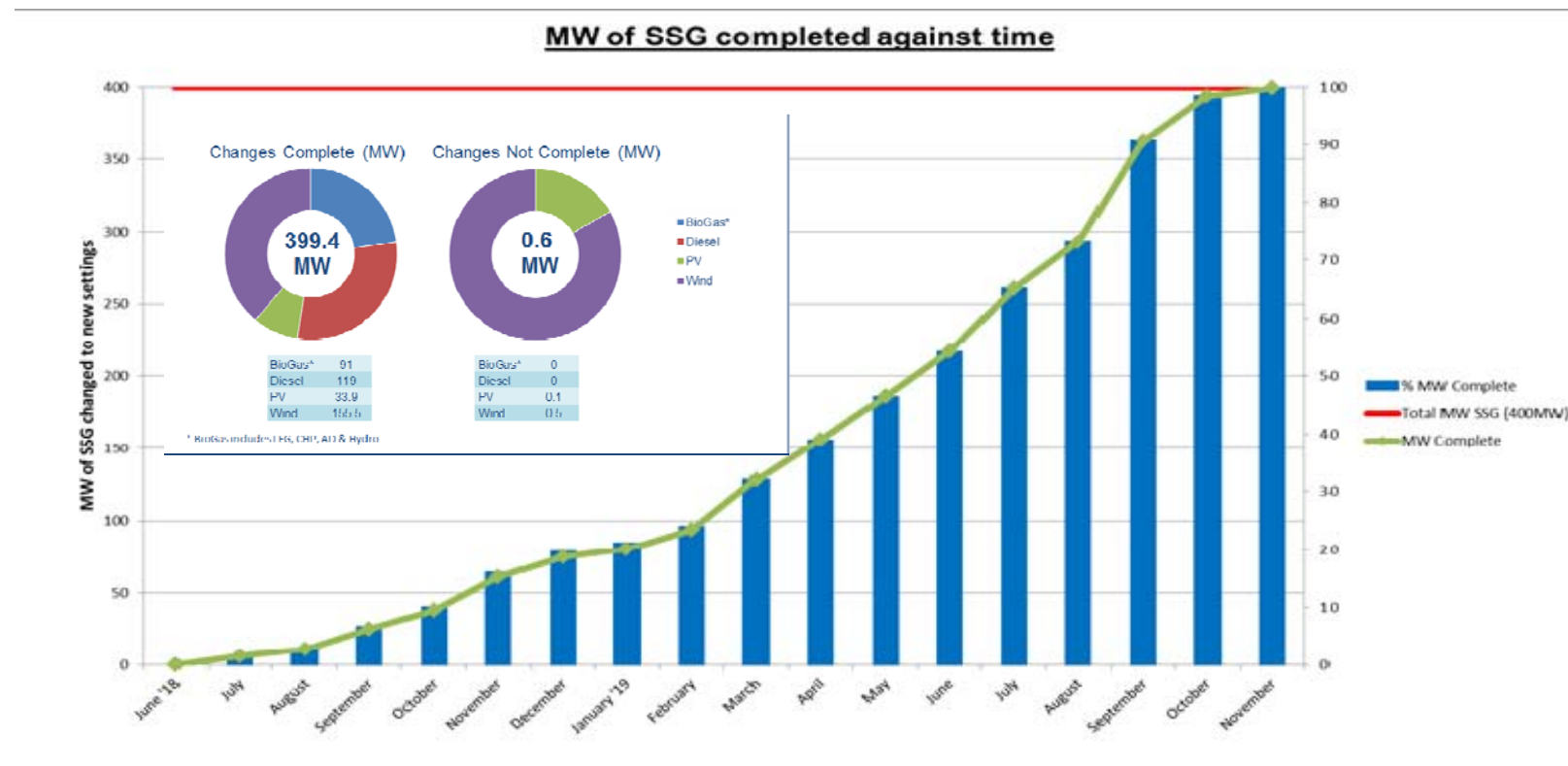
LSG RoCoF – Complete

- All LSG sites >5MW have been changed to new RoCoF setting
- 1120 MW changed to 1Hz/s RoCoF setting (including new LSG's connected during the programme)



SSG RoCoF – Current Status

- 1338 SSG's (99.6%) have been changed to new RoCoF setting
- 399.4 MW (99.85%) SSG now changed to 1Hz/s RoCoF setting



Total RoCoF (LSG & SSG) – Current Status

- 1406 Generators (99.6%) have been changed to new RoCoF setting
- 1519.4 MW (99.96%) Generation now changed to 1Hz/s RoCoF setting

