



GSR029 workgroup meeting 6

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NGESO

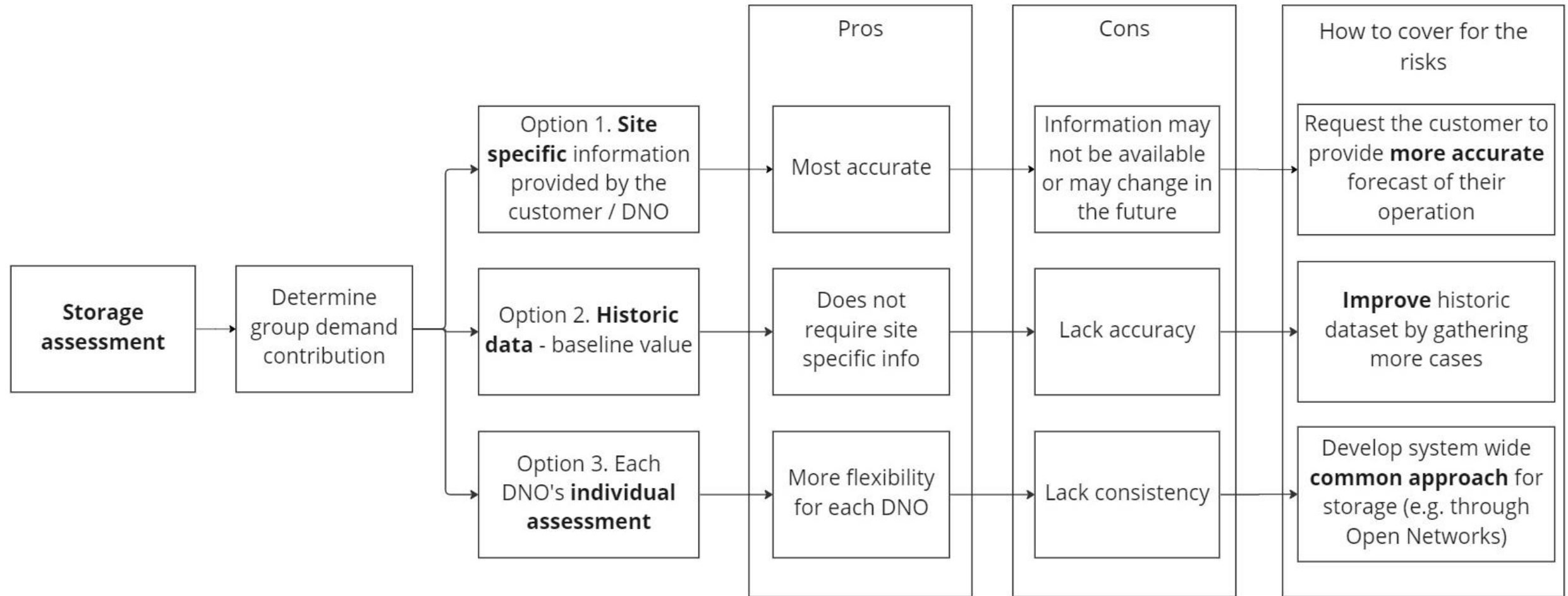
# GSR029 current status

	Technical details	Process and responsibility	Impact assessment	SQSS legal text	Grid Code legal text
Group demand assessment	<ul style="list-style-type: none"><li><a href="#">Storage</a></li></ul>	<a href="#">W24 data submission process</a>	<a href="#">Developing</a>	<a href="#">Developed</a>	Developing
Demand security assessment	<ul style="list-style-type: none"><li><a href="#">Large power stations</a></li><li><a href="#">Storage</a></li><li><a href="#">EREP 130/131 queries</a></li><li><a href="#">TO connected (tertiary and TIP)</a></li><li><a href="#">Forecast</a></li></ul>	<ul style="list-style-type: none"><li><a href="#">Planning process: W24 data submission process</a></li><li>Operational process: near real-time access to services</li></ul>	<a href="#">Developing</a>	<a href="#">3.7, 3.13-14 Developed</a> <a href="#">3.15 Developing</a>	Developing



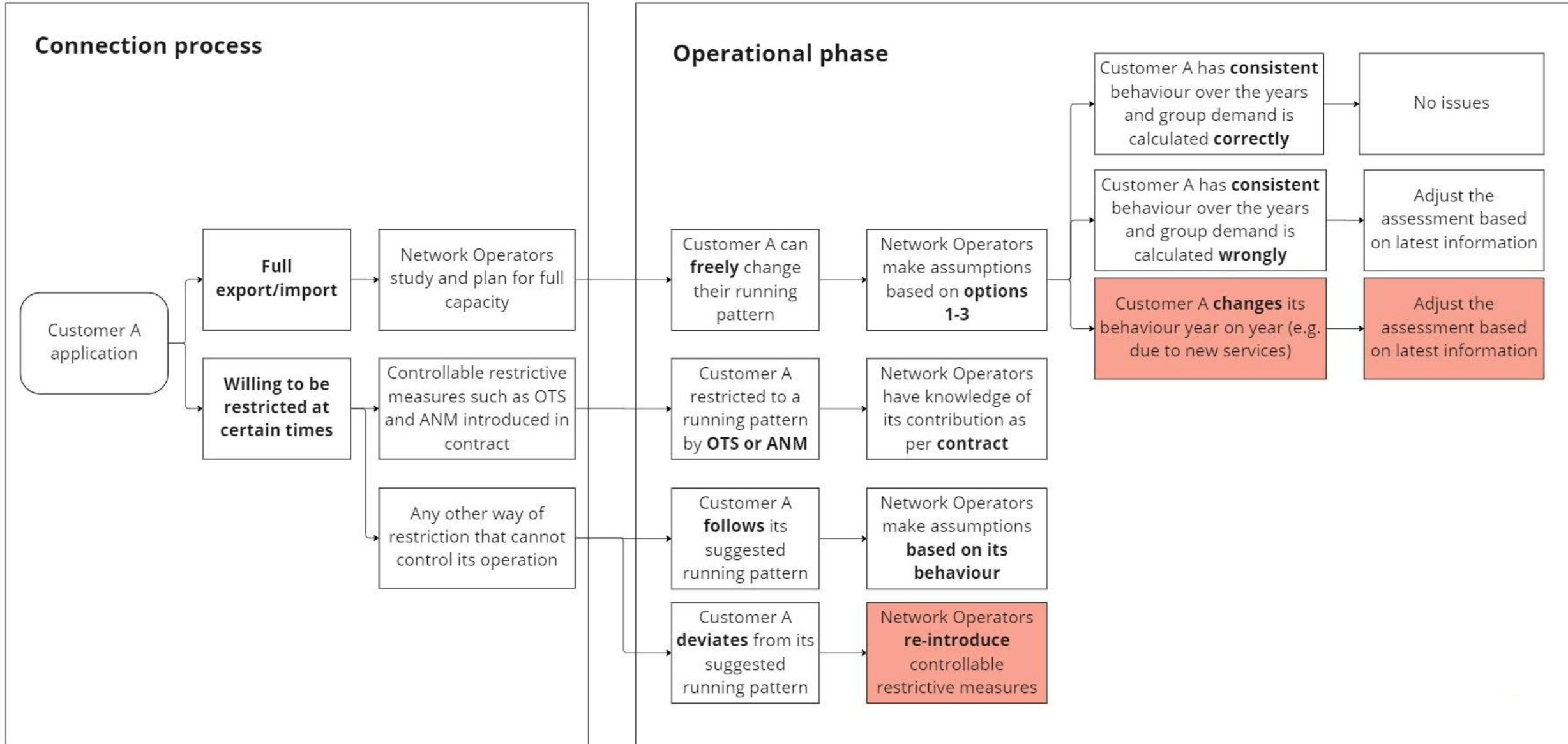


## Storage assessment – group demand contribution options





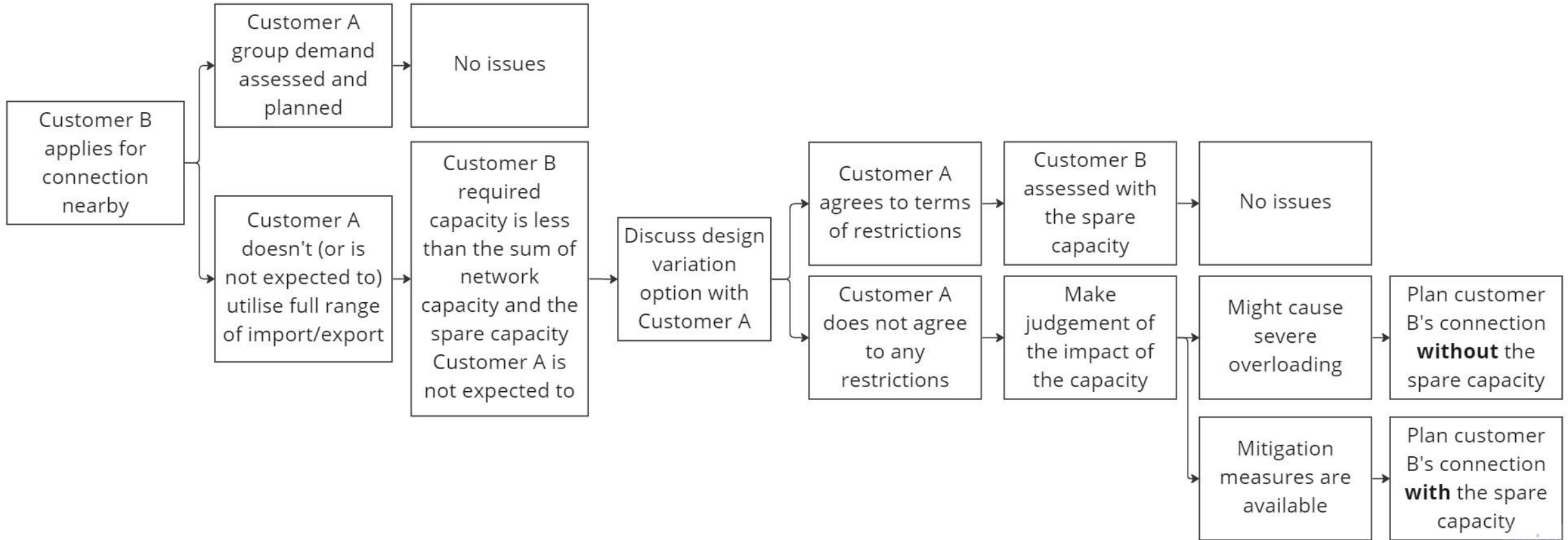
# Storage assessment – group demand process



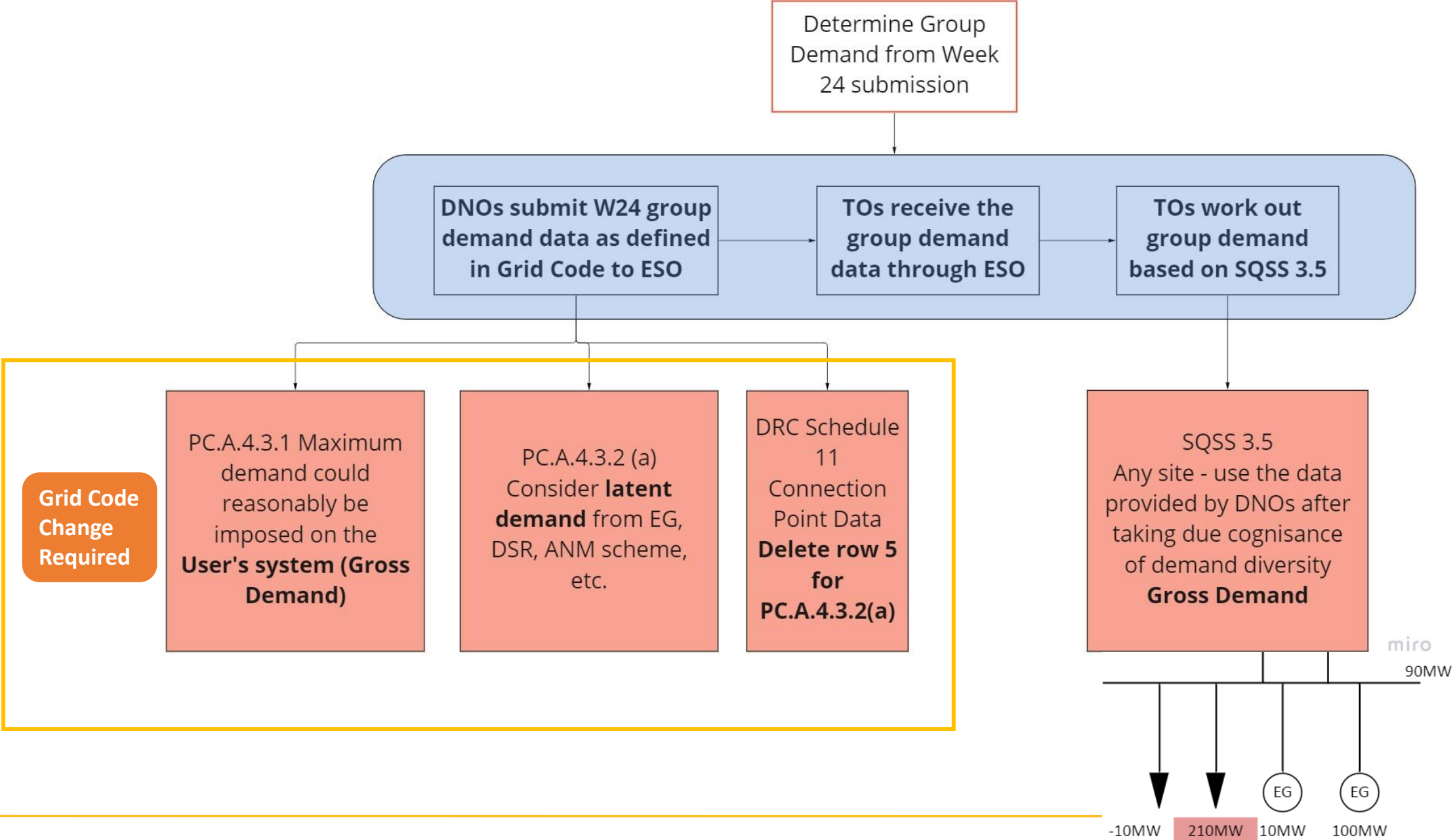




# Storage assessment – group demand process



# Group Demand Assessment – Proposed Changes





# Impact assessment – group demand

Change of the class of group demand and potential non- compliance due to the modification (net demand to gross demand)

Method 1:

- The gross demand of a demand group can be estimated by adding the deduction made by small and medium power stations to Connection Point Demand in Table 11(a) from the Week 24 data submission. This will give a rough estimate of the peak gross demand for that demand group given the possibility that the peak net demand and the peak gross demand may occur at different times.
- This should be compared to
  - The current group demand: This is to identify sites that are likely to switch from one demand group to another
  - The available supply capacity: This is to identify sites that are likely to become non-compliant

Method 2:

- Use the current group demand to identify the margin available before the group
  - Becomes non-compliant, or
  - moves to another class
- Take a view on the likelihood that the addition of EG contribution will be in excess of the margins identified
- Sites that are close to or breaching the limit, further investigations need to be carried out to fully understand the impact of the change. If the GSPs are well within limit, it is not concerning in the short term.

	Net demand	Deductions made by small and medium power stations and customer generating plants	Embedded large power station output (if applicable)	Gross demand	Total installed capacity of embedded generations
GSP 1					
GSP 2					



# SQSS legal text - Group demand

- Remove SQSS clause 3.5
- Update the group demand definition in Terms and Definitions

## Group Demand

For a single GSP or OSP: The forecast maximum demand for the GSP or OSP provided in accordance with the requirements of the Grid Code by the *network operators* or *non-embedded customers* taking demand from the *national electricity transmission system*. For multiple GSPs or OSPs: The sum of the forecast maximum demands for the GSPs or OSPs as provided by the *network operators* or *non-embedded customers* taking demand from the *national electricity transmission system* after taking due cognisance of demand diversity.

## Demand-Connection-Capacity-Requirements¶

~~3.5 The group demand which is applicable for the assessment of connection capacity requirements is dependent on the nature of the associated connections, i.e.:~~¶

~~3.5.1 where the network associated with a transmission connection comprises demand connections and connections to small or medium power stations (including those in composite user sites), group demand for future years is equal to the Network Operator's estimated maximum demand for the group which they believe could reasonably be imposed on the onshore transmission system, after taking due cognisance of demand diversity and the expected operation of any embedded small or medium power stations.~~¶

~~3.5.2 where the network associated with a transmission connection hosts the connection of one or more large power stations, irrespective of whether the large power station is connected at the transmission interface point or embedded within the Network Operator's system, the group demand at the date and time of the system/site maximum demand or other relevant assessment period is equal to:~~¶

~~3.5.2.1 the Network Operator's group demand in accordance with paragraph 3.5.1, plus:~~¶

~~3.5.2.2 the output of large power station(s)~~¶

~~3.6 → Where considered appropriate, diversity may be applied to the summation of the power flows arising from consideration of paragraphs 3.5.2.1 and 3.5.2.2~~¶





# Demand security contribution – large power stations

Utilise approach 3 specified in EREP 130

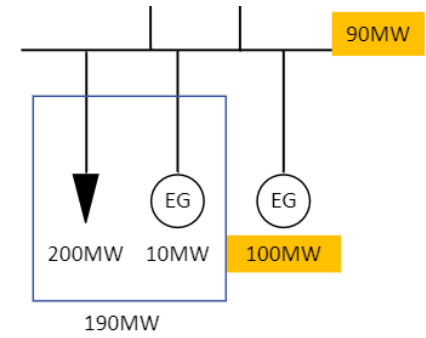
Demand profile index or name	D1
Persistence, hours	3 hours
Season (all data, winter or summer)	Winter
Demand and generation number of states	101
DG or ES	Profile index or name
DG (excluding Wind)	DG 1 (kW)

Please click the Recalculate before reading the results

Recalculate

Contribution		
Aggregate DNC of installed DG and ES	15.0	MW
Maximum value of demand	15.0	MW
Contribution (%)	89.3%	
Contribution (MW)	13.4	MW
Probability of delivering contribution	99.4%	
Probability of not delivering contribution	0.6%	
Expected energy not supplied per total DNC	3.1	MWh/MW

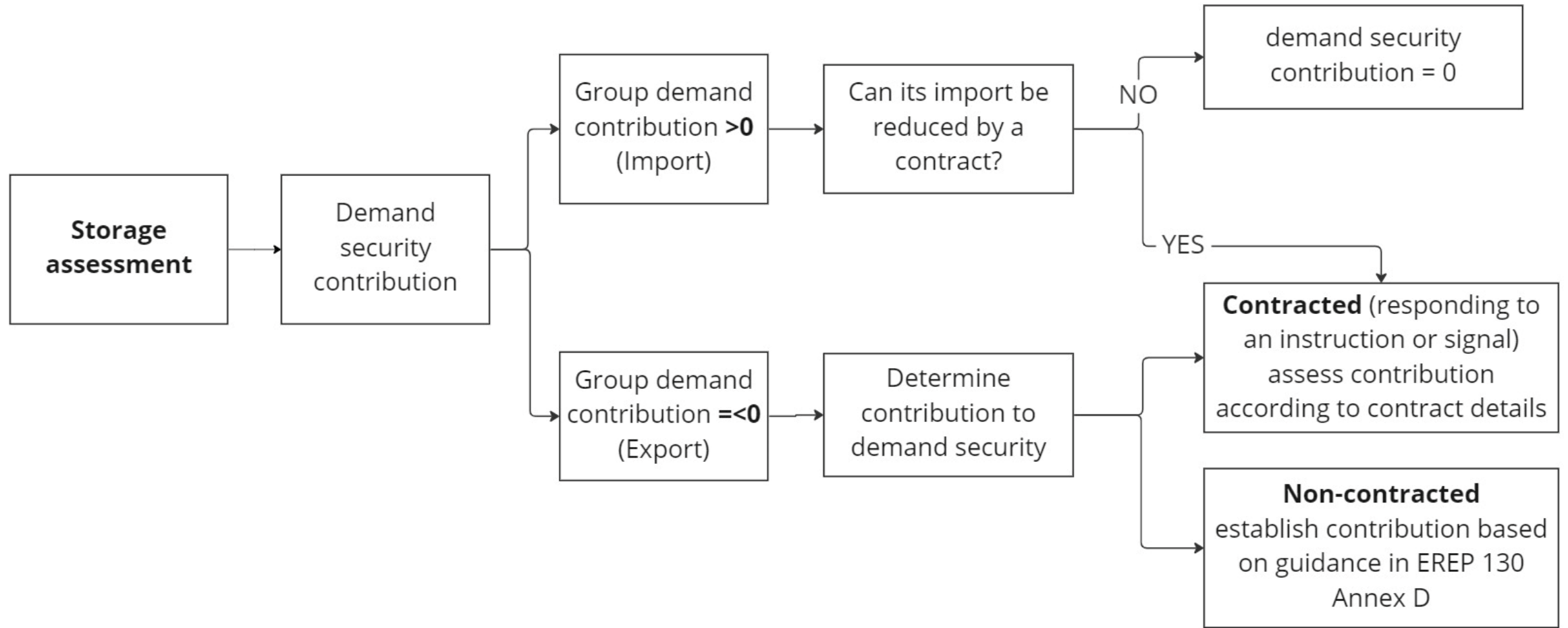
# Demand security contribution – EREP 130/131 queries



- Impact of BM or other services
  - Approach 3 is still applicable if the right input to the spreadsheet can be produced.
  - Tolerance level can be adjusted to reflect the confidence in the assessment.
- Approach 3 for energy storage
  - It is suitable for non-contracted energy storage
  - Similarly it still can produce valid results with a particular generation profile representing the behaviour of storage for a particular period of time.
- Aggregation of generators
  - Could be grouped by types and aggregated together.
  - Potential alternative to update the spreadsheet to accommodate more generators.
- Demand profile
  - It should be demand profile without considered generation but including generation that is not considered in the calculation of the overall contribution.
- How to consider BESS import and export demand security contribution
  - It could be considered separately, and that accuracy would be within data and asset tolerances. If it is considered together, within EREP 131, a carefully crafted profile for contracted DSR might be potentially a way forward.
- T<sub>m</sub> consideration for BESS
  - Contribution could be 100% until T<sub>m</sub> is equal to the rated storage duration (T<sub>r</sub>). Increasing T<sub>m</sub> contribution drops to T<sub>r</sub>/T<sub>m</sub>, e.g., for T<sub>m</sub>=2\*T<sub>r</sub> contribution would be 50%

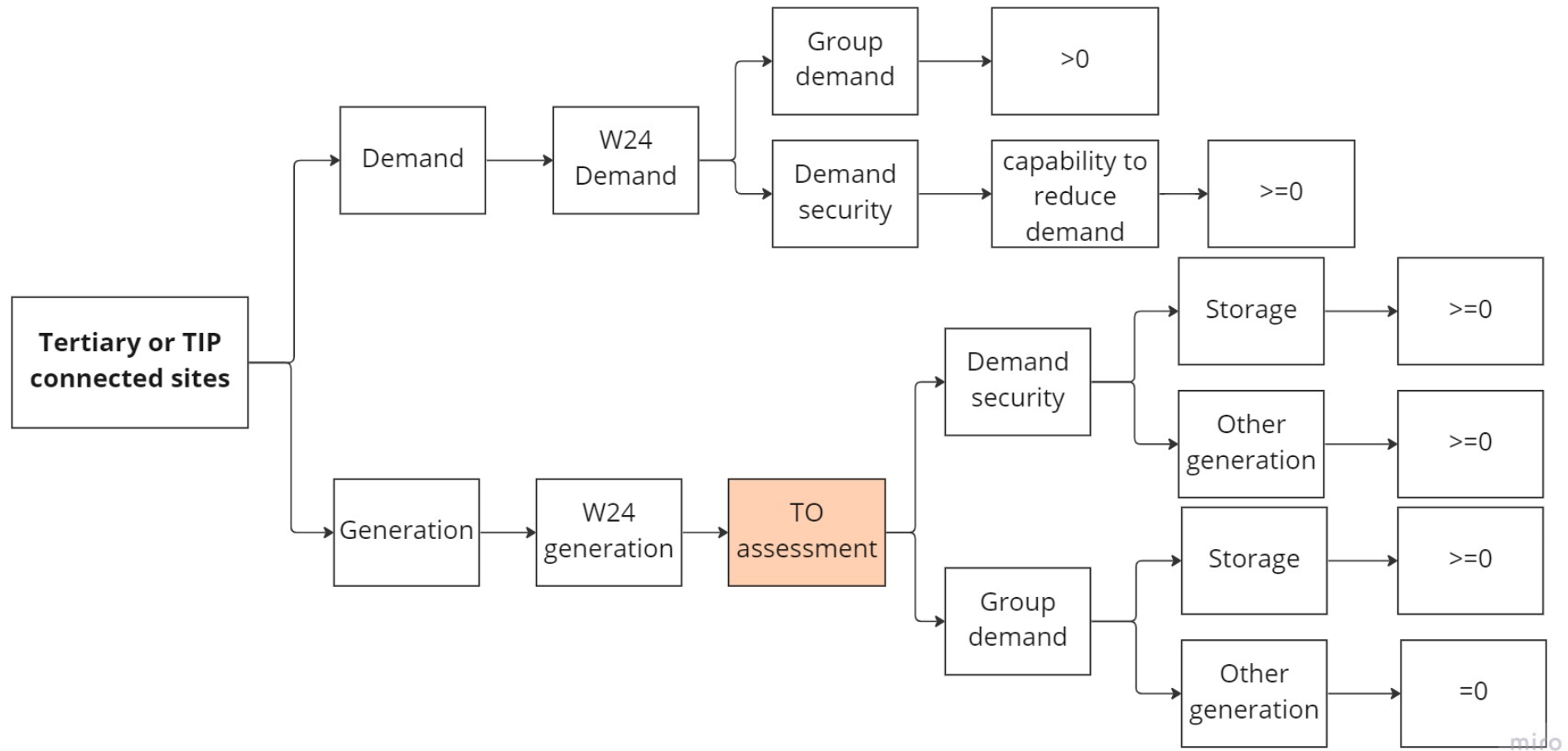


## Demand security contribution – storage





## Demand security contribution – tertiary/TIP connected







## Demand security contribution – forecast

- Demand security contribution from a single power station or flexible demand would likely to stay the same for future years.
- If new connections are likely to materialise at particular sites, demand security contribution can be added to future years.



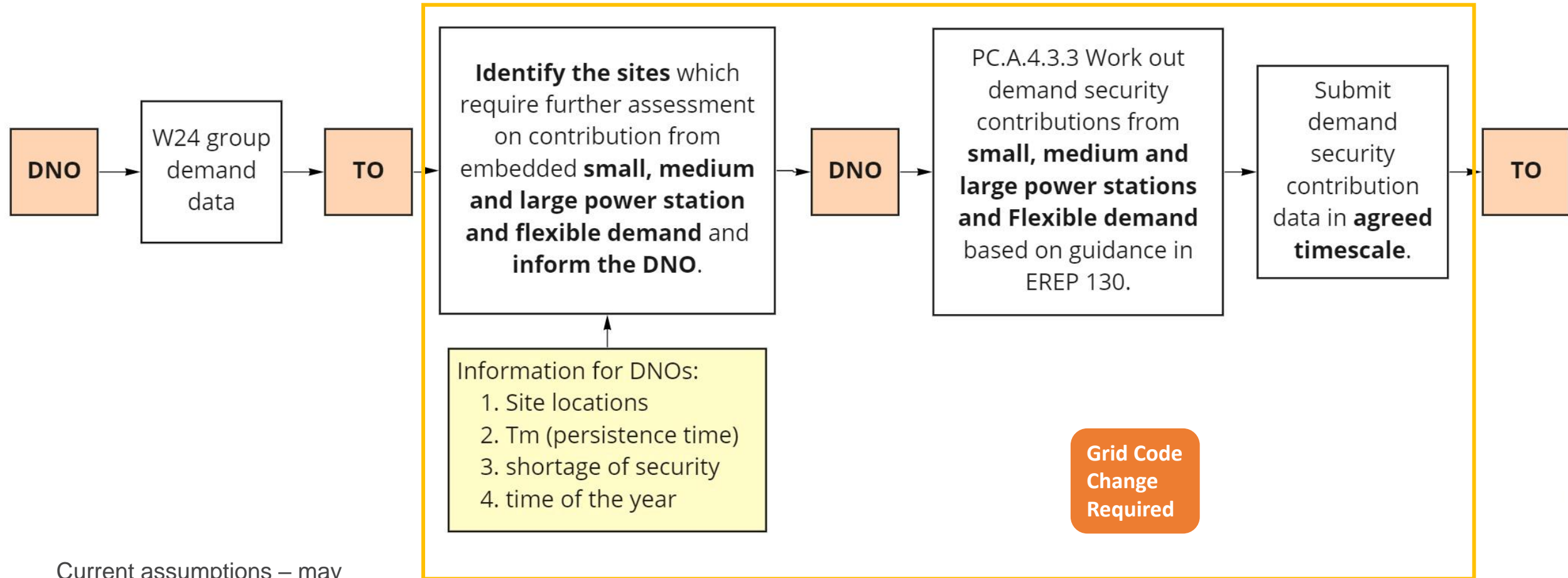
## Impact assessment - demand security contribution

For the instances where TOs use security contributions from large power stations, can the TOs assess the contribution using the methodology in EREP 130 and compare with the current practice and understand the impact for the change.

Impact of change from Table 3.2 to Approach 3 computer package approach.



# Demand security contribution data submission process



Current assumptions – may change as the solutions are being refined.



## SQSS legal text – 3.7, 3.13, 3.14

3.7 The *transmission capacity* for the connection of a particular *demand group* shall meet the criteria set out in paragraphs 3.7 to 3.11 under the following background conditions:

3.7.1 when there are no *planned outages*, the demand of the *demand group* shall be set equal to *group demand*;

3.7.2 when there is a *planned outage* local to the *demand group*, the demand of the *demand group* shall be set equal to *maintenance period demand*;

~~3.7.3 the security contribution of small and medium power stations embedded is implicitly accounted for in the group demand established by the Network Operator as in paragraph 3.5.1 and need not be considered separately;~~

~~3.7.4~~ the security contribution of ~~a large power station~~ any embedded within a customer's network (e.g. distribution network) or connected at the transmission interface point and the security contribution of any flexible demand shall be as specified in paragraphs 3.13 to 3.15 ~~and Table 3.2;~~

~~3.7.5~~ any *transfer capacity* (i.e. the ability to transfer demand from one demand group to another) declared by *Network Operators* shall be represented taking account of any restrictions on the timescales in which the *transfer capacity* applies. Any *transfer capacity* declared by the *Network Operators* for use in planning timescales must be reflective of that which could practically be used in operational timescales; and

~~3.7.6~~ demand and generation outside the *demand group* shall be set in accordance with the *planned transfer conditions* using the appropriate method described in Appendix C.

3.13 Where network assets are insufficient to meet the security requirements, it is necessary to assess the contribution to security from *large power stations* connected at either the transmission connection interface or embedded within the *Networks Operator's system* and also the contribution to security from any flexible demand connected at either the transmission connection interface or within the Networks Operator's system. This will identify whether the aggregate generation capacity of the *large power stations* and flexible demand connected to the network has the potential to meet any deficit in system security from network assets.

3.14 The combined contribution by *large power stations* and flexible demand shall never have a greater impact on system security than the loss of the largest circuit infeed to the group. The contributions from embedded *small and medium power stations* and flexible demand provide additional capacity to enable the supply of demand which may not otherwise be met following a *secured event*, but shall not replace the requirement for system connection. The assessment of contribution of generation to group security will therefore consider;

3.14.1 the generation *annual load factor*;

3.14.2 the availability of generation under outage conditions;

3.14.3 the fuel source availability, i.e. whether energy is continuous, stored, storable or predictable;

3.14.4 common-mode failure mechanisms such as common fuel source, connections or plant stability / ride-through capability;

3.14.5 capping of generation contribution in the event that the generation contribution is dominant with respect to circuit infeed capability





## SQSS legal text – 3.15

### Version 1 Transmission Owners assess contributions for large power stations

- 3.15 While taking due account of the considerations detailed in paragraph 3.14, the contribution to security of demand group shall be:
- 3.15.1 in the case of embedded small power stations, embedded medium power stations, or flexible demand, as declared by the Network Operators in accordance with the requirements of the Grid Code;
- 3.15.2 in the case of embedded large power stations or power stations connected at the transmission interface point, as estimated by onshore transmission licensees. Guidance is available in Annex D of Engineering Report 130 Issue 3 2019.

### Version 2 Network Operators assess contributions for large power stations

- 3.15 While taking due account of the considerations detailed in paragraph 3.14, the contribution to security of demand group shall be:
- 3.15.1 in the case of embedded small power stations, embedded medium power stations, or flexible demand, as declared by the Network Operators in accordance with the requirements of the Grid Code;
- 3.15.2 in the case power stations connected at the transmission interface point, as estimated by onshore transmission licensees. Guidance is available in Annex D of Engineering Report 130 Issue 3 2019.

