

Distributed ReStart



Black Start from Distributed Energy Resources Low Carbon Network Innovation Conference



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Transition to a low carbon future

In partnership with



nationalgrid**ESO**

Distributed ReStart



Animation



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<https://www.nationalgrideso.com/innovation/projects/distributed-restart>

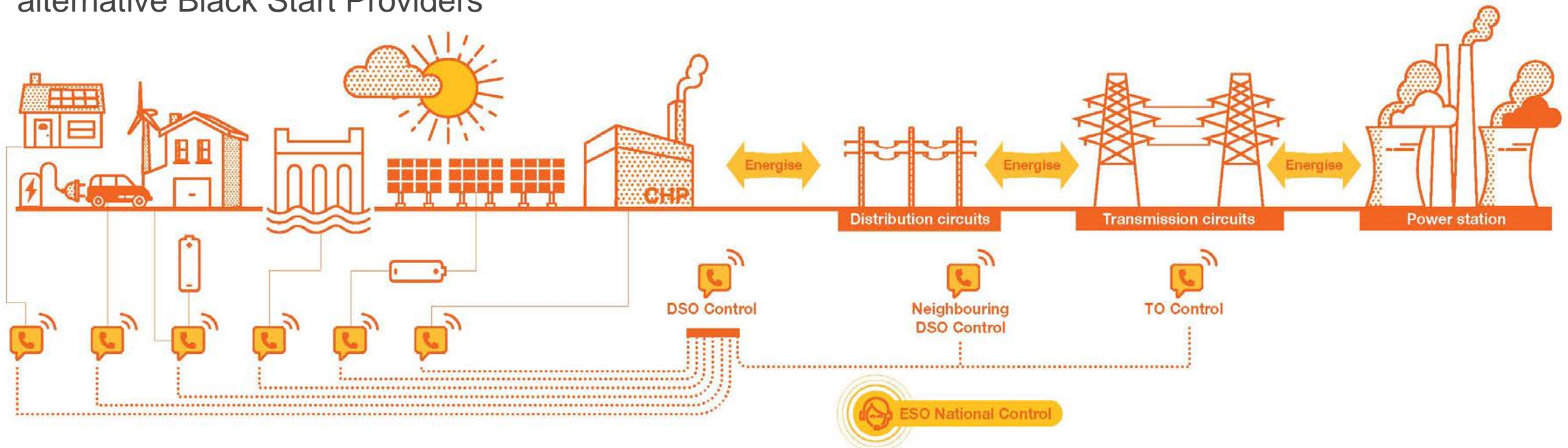
Why Distributed ReStart?



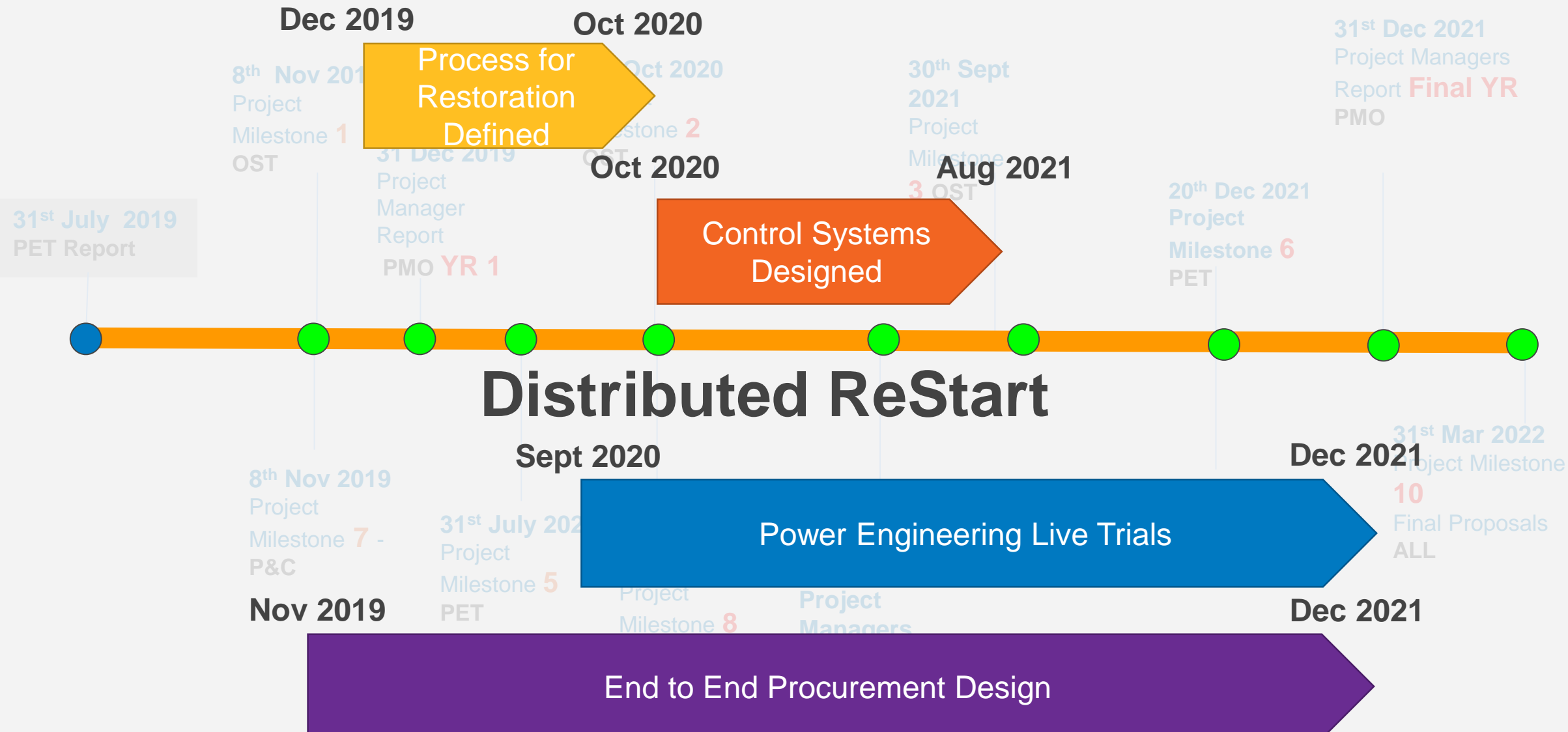
Reduce Cost to Consumers We anticipate savings of at least £115M through increased competition by 2050

Decreasing Carbon footprint Through reduction in Black Start warming we expect 810kT less emissions

Future Proofing Our Networks As our power market continues to decentralise, we need to look at alternative Black Start Providers



When Will We Deliver?



Distributed ReStart



DER :

- How do we communicate?
- Who operates the unit?
- 'Anchor' unit synchronous or asynchronous?
- Must be located on a network which can be islanded
- Voltage regulation needs to change
- Fuel must be resilient to loss of supply



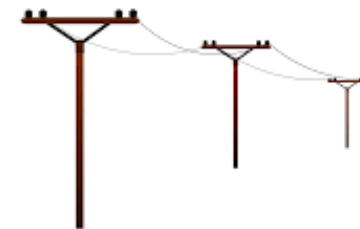
Flexible demand:

- Microgrids unproven at full DNO scale
- Instantaneous switching
- Frequency response provided through this unit?
- Can we value stack to improve economic efficiency?
- Can the flexible demand provide additional services?



Networks:

- Can we back-energise the network?
- Where should we install a new earth and who should own it?
- What level of automation is appropriate?
- How can we effectively segregate networks?
- How can we synchronise power islands?





- Anchor generator requires 20% of its rating to stabilize through incremental small loads
- An electrically local flexible demand is needed to achieve this
- A new switchable 33kV Earth is required to enable protection to operate appropriately
- New voltage droop control settings are needed to manage network gain for legacy DERs
- Energisation of the transformer will not cause voltage to exceed limits
- Additional protection settings are needed to operate under lower fault level
- Distribution substations may only have resilience for 18-72hrs
- Low voltage fuses will operate as expected
- Growth of the network to real demand will involve near simultaneous switching of network and flexible demand to reduce block seen by generator so automation is needed

Look out for.....



ReStart Customer Connection Seminar	05/11/2019	Glasgow	presenting/roundtable
Procurement & Compliance – milestone report published	08/11/2019	Ofgem paper	project deliverable
Organisational Systems & Telecommunication – milestone report published	08/11/2019	Ofgem paper	project deliverable
Project Managers Annual Report – published	31/12/2019	Ofgem paper	project deliverable
ReStart Annual Conference	30/01/2020	London	registration open

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