



Magnox

**NuLeAF Steering Group meeting**

*29 January 2020*

# The transition to a subsidiary

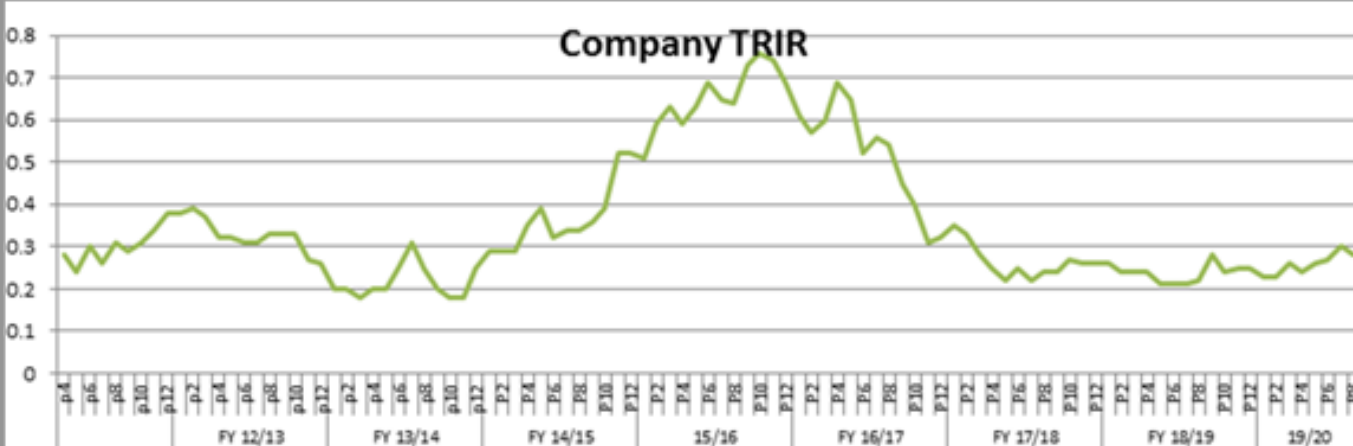
- A strong focus on safety
- Our mission remains the same
- But ready to take advantage if opportunities arise
- One NDA; working in partnership



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# Safety

- Safety is still our over-riding value
- Our recent focus has been on safe behaviours and a “decommissioning mind-set”
- Transition did not have an adverse impact



# Focus areas

- Build on our progress
- Take Magnox forward
- Involve our employees



# Delivery update

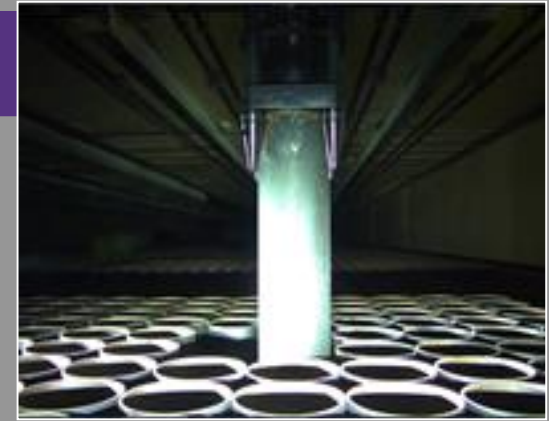
- Maintaining the programme approach
- At the end of the contract, all PBIs and 43 out of 49 milestones were delivered
- Focus on safely delivering our current 2019/20 targets
- Good news on our budget for 20/21, but we need to keep delivering
- Re-baselining taking place currently, news will follow in due course



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# Update – Waste

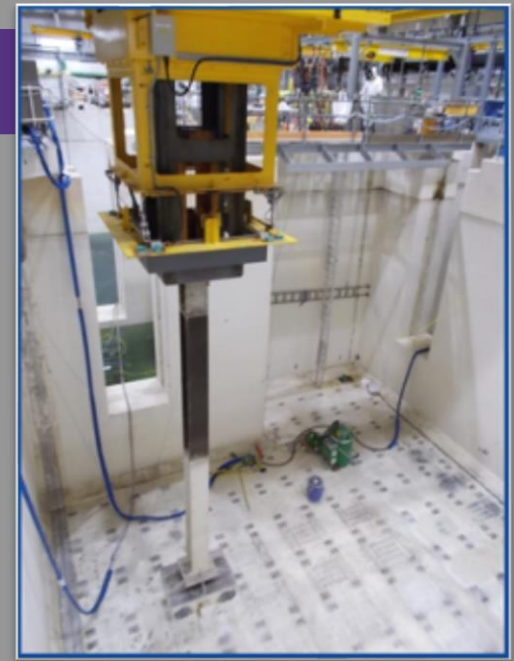
- Successful vault retrievals after historical issues
  - Berkeley – 112 ductile cast iron containers filled
  - Hunterston – four out of five bunkers complete
  - Trawsfynydd – more than 50% north fuel element debris (FED) retrieved
- Modular intermediate level waste encapsulation plant (MILWEP) – one design, three sites
- Bradwell FED to Low Level Waste Repository (LLWR), process agreed
- Wylfa Dry Store Cell 4 successful ILW recovery
- Future focus: fill the first concrete box



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# Update – Decommissioning

- Sizewell ponds fully drained
- Sizewell National Grid connection building demolished
- 48,000 bags of spoil excavated from Harwell liquid effluent treatment plant (LETP) land remediation
- All fuel hangers jacked-up at Winfrith's steam generating heavy water reactor (SGHWR)
- Dungeness ponds fully drained



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# Update – Asset Management

- Will deliver about 100 projects during 2019/20, including:
  - Chapelcross – completion of reactor pressure circuit vessel and heat exchangers
  - Dungeness – complete mains water improvements
  - Trawsfynydd – complete 40% of the diversion culvert
  - Hinkley – glazing replacement at reactor building pile cap
  - Wylfa – assets to dispose/re-use or recycle 120 tonnes off-site
- On-going work associated with Bradwell C&M



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# Socio-economics

## Cumulative figures: £840k approved (out of £1m fund)

- Matched external funding – £5,699,137
- Economic benefit - £920,250
- Employment opportunities – 9
- Jobs safeguarded - 30
- Voluntary jobs – 896
- Training opportunities – 2451
- Schools supported - 399
- STEM activities – 50
- Sports activities – 662
- 2019/20 managed by Magnox: Morlais Tidal Energy, £200k; Anglesey County Council -North Anglesey Regeneration Plan, £110k; Capel Bethlehem Project, £150k.
- North Ayrshire College £500k
- Arloesi Gwynedd Wledig £95K



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# Forward look - engagement

- **Optimised end states** – Working with NDA to define and deliver requirements for all Magnox sites
  - Beginning of the process and we will ensure there are opportunities for stakeholders to share their views
- **Waste strategy** – Magnox refused permission by Somerset County Council to import ponds skips from Sizewell, Oldbury and Dungeness for packaging and interim storage at Hinkley Point
  - Considering options on re-applying and/or appeal



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# Forward look: reactor decommissioning

- Current reactor decommissioning strategy involves putting sites into a safe state for decades of quiescence known as Care and Maintenance (C&M)
- Sites are planned to enter quiescence at different times, with a period of ~30 years where all are in C&M before reactor dismantling begins at the first site
- The underlying drivers for a deferred reactor dismantling strategy are:
  - Benefits of radioactive decay both in terms of:
    - Dose rate reductions, so significant dismantling can be done with worker/manual access
    - Reduction in the category of radioactive wastes



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# Reactor decommissioning cont.

- Avoiding the need for interim storage of reactor waste pending consignment to the Geological Disposal Facility (GDF)
- The substantial reduction of lifecycle costs on a discounted or NPV basis
- Decision taken in 2010 to accelerate Bradwell and Traws into C&M as part of a lead & learn approach. Circa 2014/15 began to accelerate just Bradwell



# Why change?

- Learning from putting Bradwell into C&M suggests there are other strategies which could now be more optimal for certain sites
- Establishing a 'rolling programme' of continuous reactor decommissioning will reduce the risk of significant skill and knowledge loss
- Along with changes in government discounting policy, there is a need to provide greater certainty of full reactor dismantling costs
- The above will reduce uncertainty around lifetime decommissioning costs and liabilities for the UK taxpayer
- As the world continues to learn about reactor decommissioning there is increasing guidance from the IAEA and NEA to not defer dismantling



# Why change?

- Recent progress in developing cost effective remote dismantling technologies to reduce worker dose means the benefit of delay & decay is reduced
- New routes for LLW (e.g. metal recycling, landfill) and increased HAW storage options mean we have cost effective waste management solutions available now
- There are emerging opportunities to realise synergies with EDF AGR ('B') station decommissioning and re-purpose some sites e.g. SMRs
- The NDA Board has endorsed a change in Magnox reactor decommissioning strategy away from blanket deferral/C&M to site-specific strategies



# Strategic principles

- As part of the change in strategy Magnox will target the concept of continuous reactor decommissioning (CRD)
- CRD will involve totally dismantling the reactor and demolishing the pond building to allow the site to potentially be re used
- Implementation will continue to be driven by the 'lead and learn' approach combined with work prioritisation using our hazard categorisation process
- A 'rolling programme' will require sites to wait their turn for full dismantling and demolition due to resource constraints



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## Strategic principles cont.

- A component of overall CRD implementation will be considering Back to Bioshield (B2BioS) for some sites as a stable interim state
- All sites will remain part of a 'peloton' through to a stable interim state that either enables CRD or a period of short/medium/long term quiescence with minimal intervention
- Treatment of HAW and bulk asbestos will remain a top priority across the fleet as part of overall risk reduction for the next few years
- Winfrith and Harwell site strategies will remain unchanged and continued to be fully funded

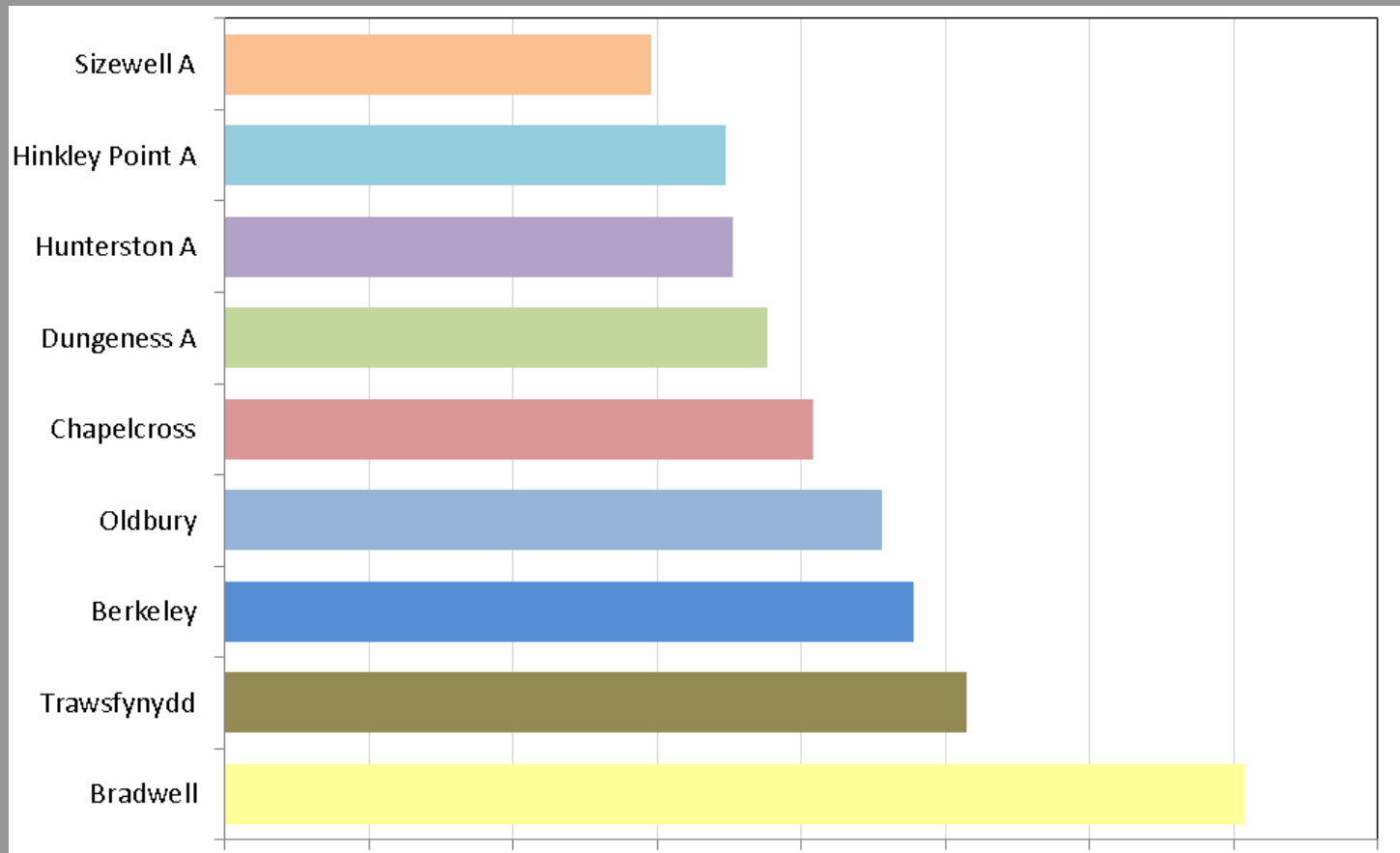


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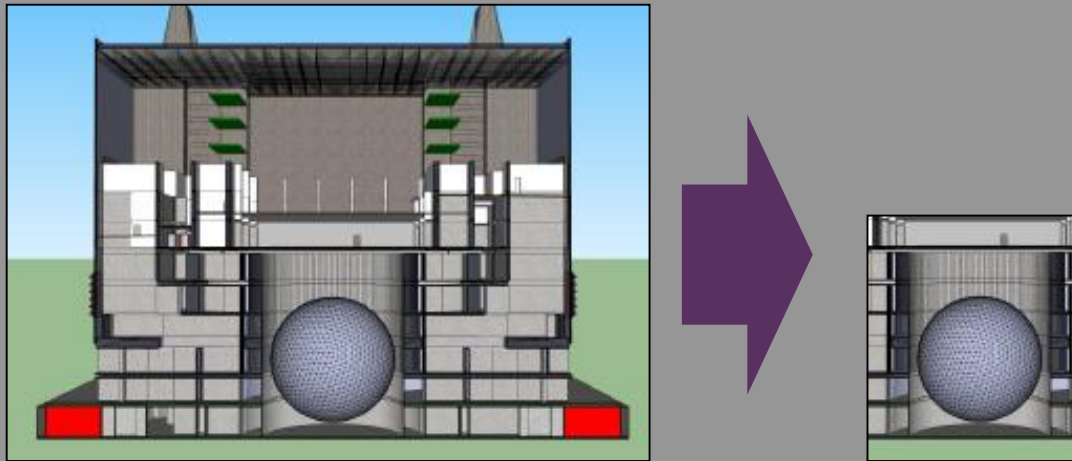


## We will continue a 'peloton' approach to ensure no sites fall away

- Total spending on each Magnox site over the last 10 years



# What is Back to Bioshield (B2BioS)?



- B2BioS utilises the existing bioshield walls as an effective outer envelop. It can typically reduce the size/volume of the reactor building to ~10%
- Significantly reduces maintenance costs and uses conventional decommissioning techniques, therefore relatively low technical risk



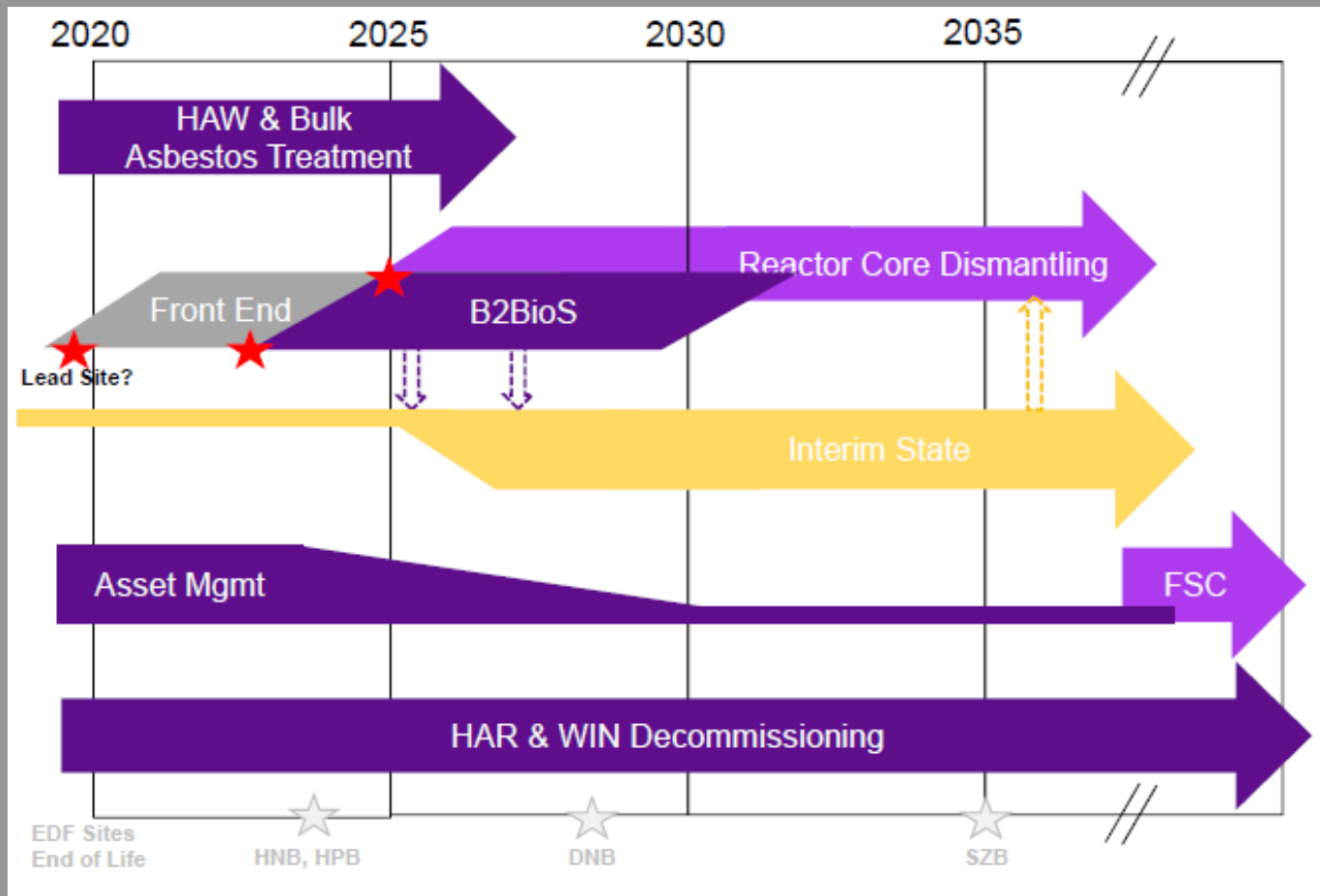
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# What is Back to Bioshield (B2BioS)?

- B2BioS is a first significant step towards CRD. It will enable visible short term progress to be made on CRD whilst front end definition is undertaken and solutions identified for key technical challenges
- B2BioS will also enable other sites to be put into stable states of quiescence without reactor building management costs and stakeholder concerns escalating
- Provides flexibility and minimal regulatory work as it is a step towards any end state



# Illustrative Magnox decommissioning timeline



# Next steps

- An announcement on the change in strategy is planned to be made by the NDA in March/April. This will include confirmation of a 'new' lead site
- We will pursue front end work over the next 12+ months to:
  - Underpin the change in strategy
  - Define interim states & quiescence periods for each site
  - Update our Lifetime Plans
- As part of this we will:
  - Engage in dialogue with our regulators on implementation detail



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## Next steps cont.

- Leverage the supply chain and partnering
- Ensure Magnox has the right skills and resources
- Collaborate and learn internationally with regards to reactor dismantling
- Seek approval to optimise waste management under Guidance on Requirements for Release from Radioactive Substances Regulations
- Keep all stakeholders proactively updated
- Continue to focus on hazard reduction and building demolition at the sites



# Forward look - delivery



## England

### South east region

- Sizewell: complete ponds stabilisation
- Dungeness: complete bulk asbestos thermal insulation removal and ILW bulk resin retrieval
- Bradwell: intermediate storage facility (ISF) package receipts

### South region

- Harwell: LETP decommissioning and land remediation, continue nuclear materials transfers, the release of 5 hectares to the campus
- Winfrith: continue decommissioning of SGHWR and Dragon



# Forward look – delivery

England

South west region

- Hinkley: build MILWEP, complete fill house installation, complete active commissioning of the modular active effluent treatment plant (MAETP)
- Oldbury: turbine hall demolition, ponds building works
- Berkeley: build MILWEP, progress waste retrievals and processing



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# Forward look – delivery



## Wales

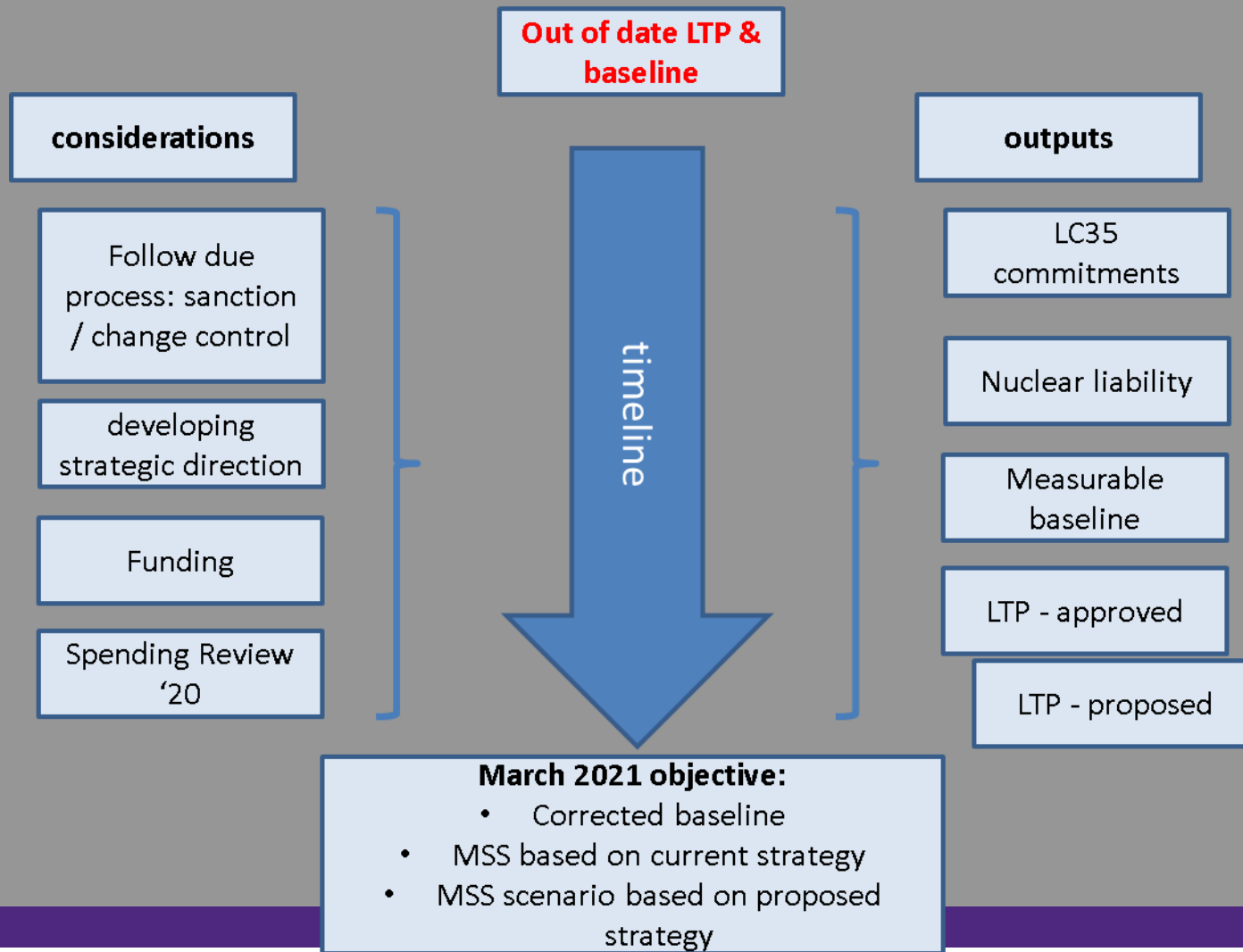
- Trawsfynydd: North FED bulk retrievals, height reduction enabling work
- Wylfa: electrical overlay project

## Scotland

- Hunterston: bunker 1 cleared, wet ILW retrievals encapsulation plant (WILWREP) bulk sludge to be completed, solid ILW encapsulation (SILWE) plant commissioning
- Chapelcross: reduce legacy waste, build MILWEP, commence higher active waste (HAW) operations (ponds and Chapelcross processing plant)



# Baseline & LTP repair: the journey



# Questions

