

UK Nuclear Industry Solid LLW Strategy

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Context

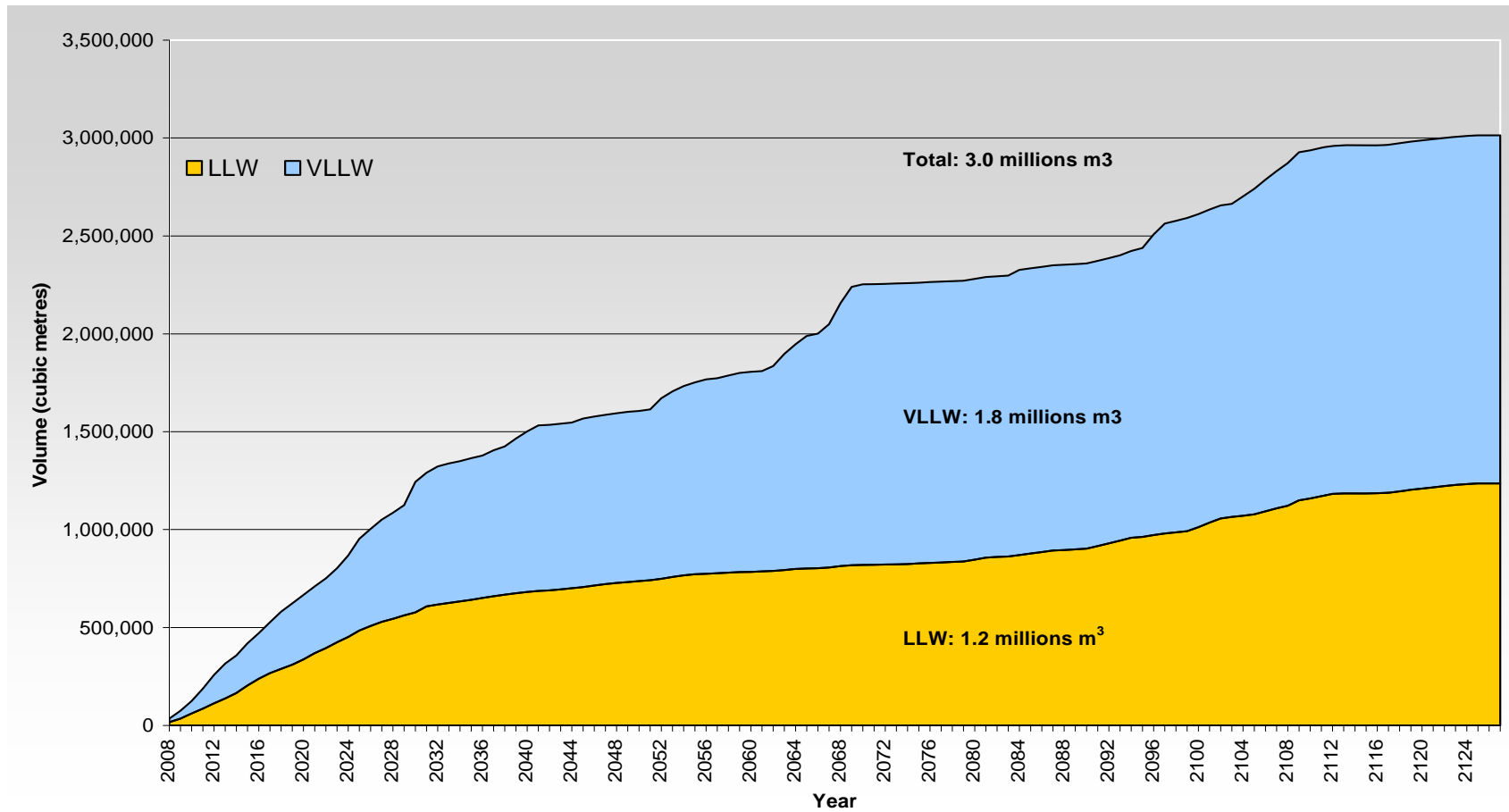
- **Mandate from revised Government LLW policy**
- **NDA business plan commitment**
- **UK LLW strategy required to support nuclear industry decommissioning and clean up**
- **Nuclear Industry strategy developed in line with DECC non-nuclear industry LLW strategy**

- Policy requires NDA to publish a UK LLW Strategy and Management Plan for integrated LLW management throughout the UK
- Policy framework introduced a *more flexible and fit-for-purpose approach for LLW management centred around the application of the waste hierarchy*
- This is the NDA drafting the strategy to implement the LLW policy

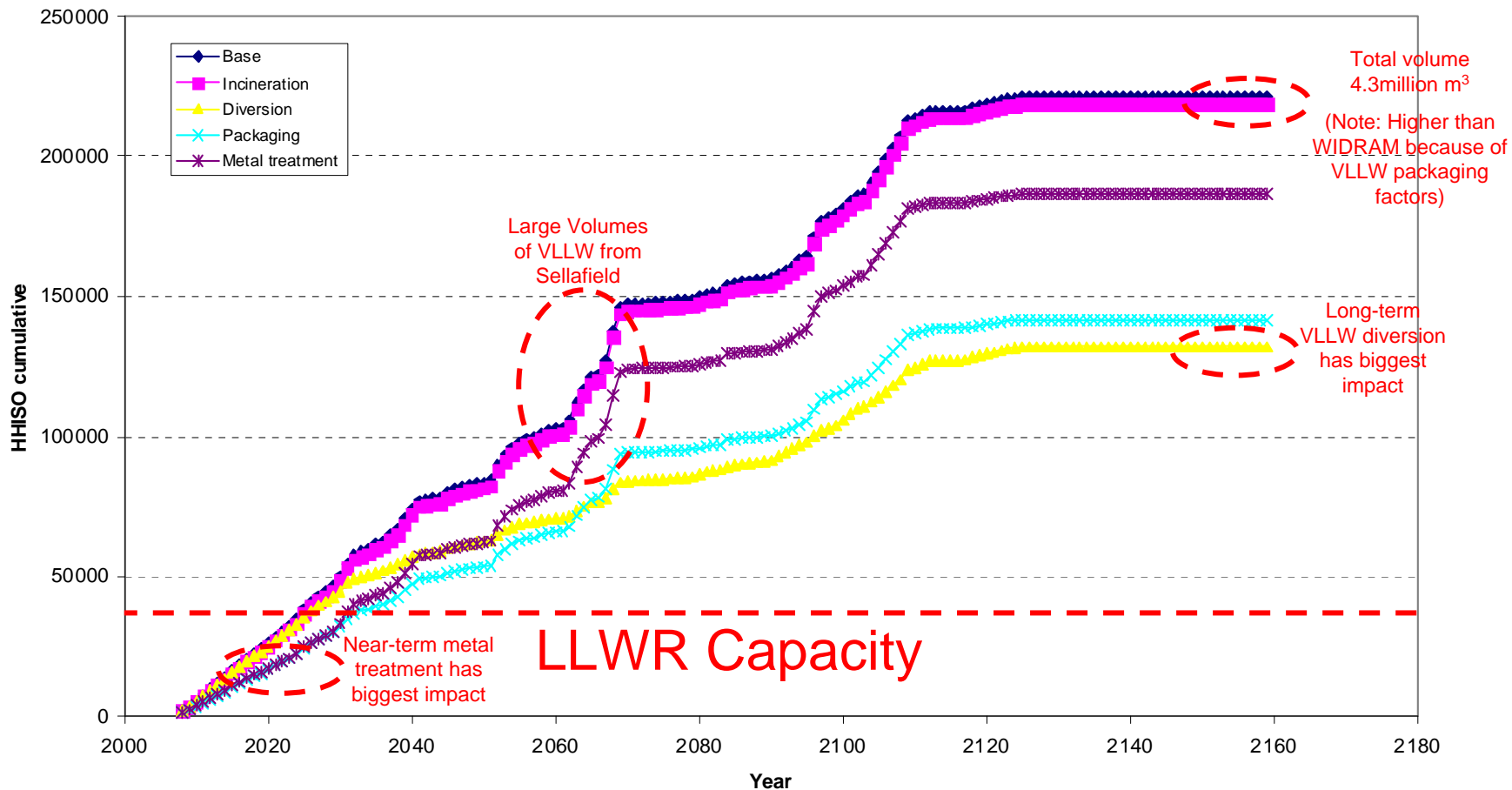
Background

- Size of the *opportunity*
- *~3 million cubic metres of LLW over >100 years*
- *Existing plan to use LLWR and then build a replacement*
- *We've been asked:*
 - *How best to optimise the existing asset*
 - *To assess the extent to which other LLW disposal options might be employed*
 - *If, and at what time, a replacement or replacement/s may be required and planned for*
- NDA competition and procurement strategy developed in line with policy
- Requirements and the 'exam question' defined...

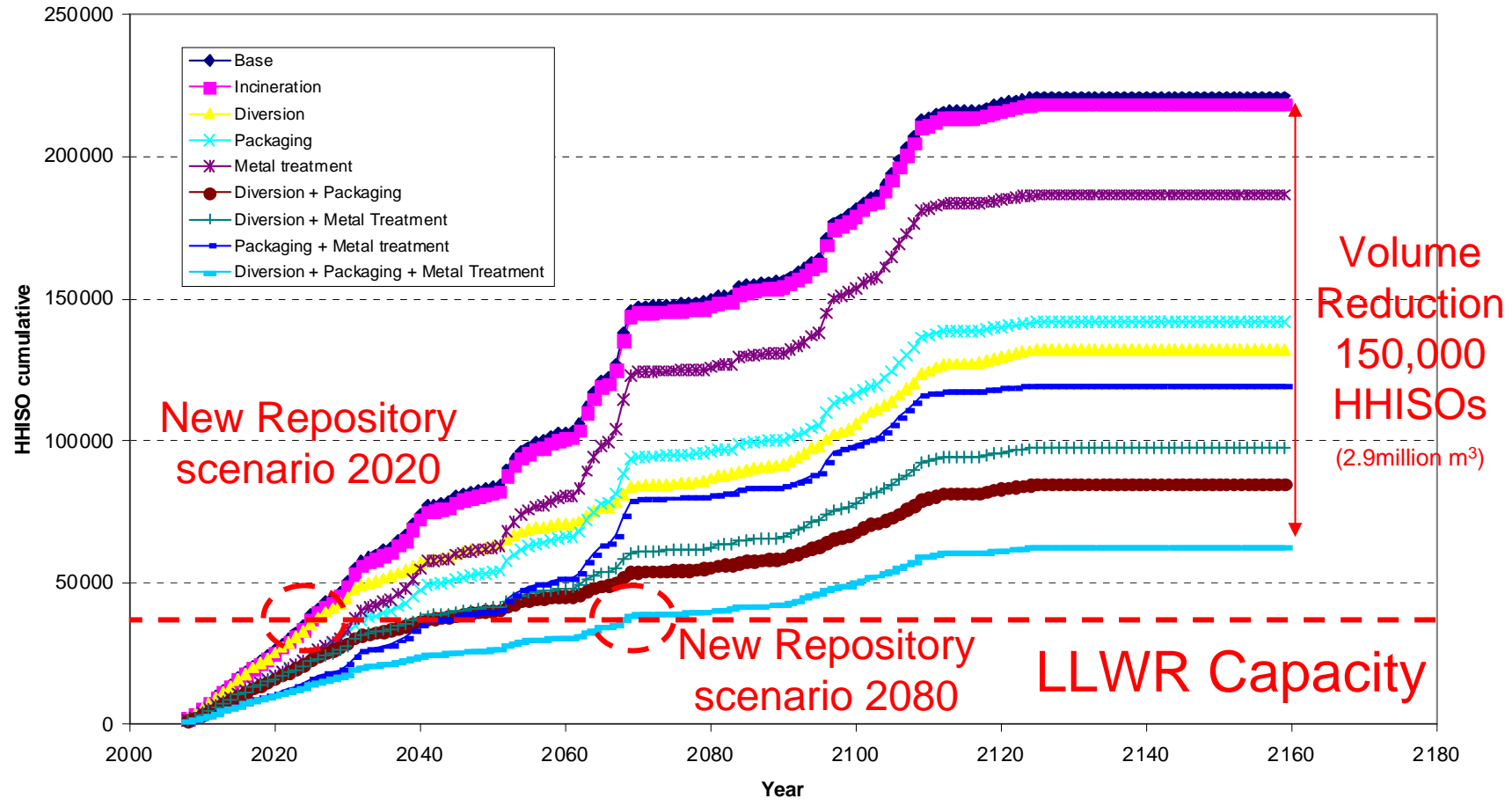
Raw Volumes of LLW and VLLW



Size of the Opportunity – Potential volumetric implications of WMH options

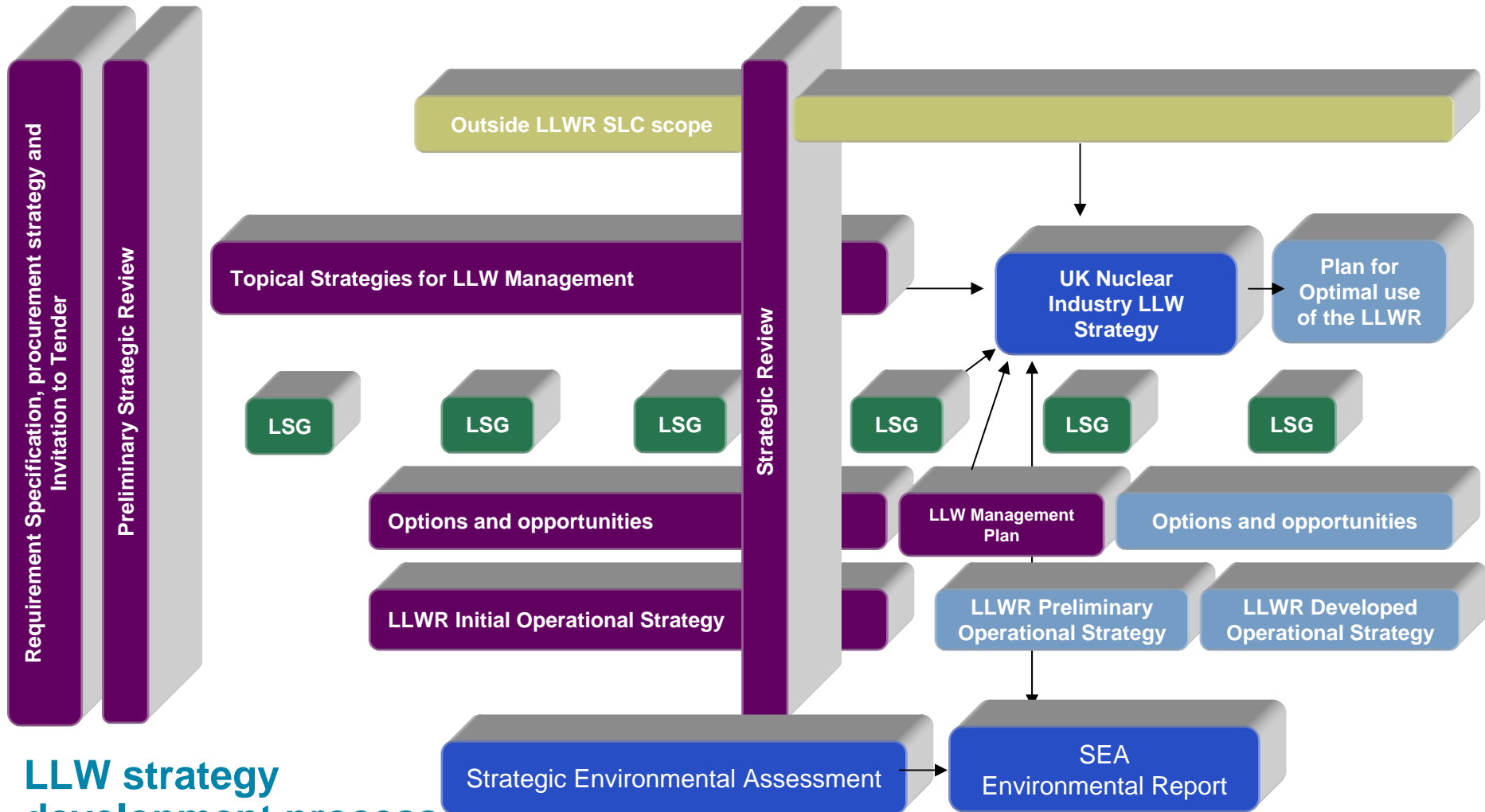


Summary of potential cumulative volumetric impact from of WMH options



Strategic development process and inputs

- Contracts and Policy
 - NDA procurement strategy; ITN; Policy; NDA M&O contracts
- Technical Reports and Strategies
 - NDA Strategy; Strategic BPEOs; Risk Assessments; Option studies; Strategic Environmental Assessment, Topical Strategies; Outline business cases; operational strategies, LLW Strategic Review;
- Position papers
 - LLW & VLLW management, disposal, treatment, metals, combustibles, soils, asbestos, concrete & rubble, uranium bearing wastes, hazardous wastes, orphan waste potentially suitable for LLWR disposal, short and long lived wastes
- Stakeholder Influence
- National Integrated Waste Strategy
- NDA Strategy Management System



LLW strategy development process



...so, what's the strategy going to say?

...the description of the journey to get where we need to go

Vision

Protect human health and the environment

Facilitate ongoing hazard reduction and decommissioning

Provide continued capability and capacity for the management and disposal of LLW in the UK for all current and future LLW owners

Provide a framework for development and implementation of LLW management plans

Consider impacts of waste management options on a national scale

Provide value whilst trying to minimise the environmental and social impacts from the management of LLW coupled with the most advantageous use of the UK Low Level Waste Repository

Environmental and strategic principles

- Set of principles and values outlining the boundaries around the approach taken and potential constraints to strategy implementation around:
 - Health, safety security and environment
 - Sustainability
 - Availability of waste routes
 - Need for flexibility (time and quantity)
 - Non-creation of waste in the first place
 - Characterisation
 - Effective risk based proportionate regulation
 - Stakeholder and community engagement
 - The need for sound underpinning business cases
 - Environmental decision making
 - Importance of lifetime cost analysis, and
 - The importance of working together with solution providers, supply chain and waste producers

The Waste Management Hierarchy is central to NDAs solid LLW Strategy

- 3 main strategic themes in order of the WMH
 - I. Avoid, characterise, minimise and treat to support the waste management hierarchy
 - II. Open and exploit new fit for purpose waste routes
 - III. Make best use of existing assets

I. Prevent, characterise, minimise and treat

Avoid

- Much good practice routinely in place; can do more
- Waste must not be created in the first place
- Wastes must be appropriately characterised at source and segregated so as to not foreclose diversified management options
- Waste avoidance and minimisation should be a fundamental principle of design and operation of all new nuclear facilities and contaminated land planning to realise potential of appropriate in-situ management

Characterise

- Standards, objectives and guidance on waste characterisation, monitoring and sentencing should be implemented consistently across nuclear sites
- Shared learning from experience to support development of a comprehensive programme of good practice techniques, equipment, protocols and procedures

Minimise, re-use and recycle

- Maximise sorting and segregation of individual waste types at source, and clearance and exemption through expanded role of NiCoP, as far as practicable.
- Consideration given to minimising worker dose and occupational hazards in line with ALARP procedures
- Continued use of compaction, optimisation of packaging through wider use of existing and new containers
- Consideration of decay storage on a case by case basis
- Maximise opportunities for re-use and recycling of materials within the NDA and non-NDA estate; identifying end users for soil, rubble and demolition materials

Treat

- Between now and 2020, or until UK treatment capacity is operational, treatment routes should be utilised to ensure optimum use of the existing national disposal facility.
- Metal decontamination/smelting and incineration of candidate wastes should be pursued as a minimum and demonstrated via site specific reference to strategic BPEOs where applicable
- Establishment of a stable and competitive market will provide confidence for private investment; fair, pluralist approach, market driven as far as possible
- Centralised procurements of services through smart brokering provide economies of scale which maximise opportunities for all waste owners
- Candidate material should be diverted from disposal to ground, cleaned, treated, recycled and exempted
- Viability and options for upgrading and/or expanding existing waste infrastructure yet to be demonstrated though considered an opportunity for providing wider services to NDA and non-NDA waste owners
- Flexibility is required for wastes to be sent to sites for treatment and onward movement to their final disposal location when co-ordinated through a centralised body on behalf of NDA
- Asbestos should be despatched to most environmentally optimal disposal route, currently landfill for non-radiological and VLLW asbestos. Treatment has not yet been demonstrated as an economical option even though recognised as an environmental opportunity

II. Open and exploit new fit for purpose waste routes

- For wastes that cannot be prevented, further minimised, diverted for recycling or re-use, final unretrievable disposal is the end point for all LLW
- The following disposal options are available and should be considered on a case by case basis where regulatory requirements can be demonstrated
 - In-situ
 - Specified landfill or incineration, locally, regionally or nationally
 - On-site disposal or other near surface facilities, locally, regionally or nationally
- The Environment Agency publishes Guidance on the Requirements for Authorisation for disposal facilities to ensure risks to people and the environment are ALARA

Dounreay LLW facility

- Continue to develop plans, work with DSRL to ensure optimised waste management at the site and best use of the new facility for LLW and VLLW

VLLW disposal and controlled burial

- Appropriate routes for controlled burial of LLW and disposal of VLLW and EW are needed in the very near term to support implementation of the policy and preserve national capacity at the LLWR
- The supply chain must be supported in developing new multi-site routes in the short, medium and long term to enable efficient, cost effective decommissioning and environmental restoration

On-site disposal

- OSD is consistent with the waste management hierarchy, although not a preferred solution over diversion of appropriate LLW and VLLW to alternative management routes. OSD will be considered on a case by case basis to understand the implication of the proposal with decommissioning, cleanup and site end state strategies. Robust business cases will be required for proposals on NDA estate

III. Make best use of existing assets

Optimised use of LLWR

- Only appropriate wastes consigned for disposal to extend life of the facility and make best use of engineered multi-barriered containment, linked to conditions for acceptance and prising methodology
- Co-mingling of exempt and VLLW in containers intended for the LLWR shall be avoided as far as practicable
- New packages for enhanced transportation and disposal shall be developed by the LLWR to centralise and integrate management and disposal of low level waste forms
- Improved methods of transport, co-ordinated by the LLWR shall be developed and implemented between consignor sites and waste treatment and disposal facilities in the UK and overseas
- LLW transport strategy being developed as part of LLWR operational strategy development by March 2010, however, preference for use of rail infrastructure recognised where practicable and not entailing disproportionate cost
- LLWR will co-ordinate and report best available information on LLW inventory to support national capacity planning and future business case development and implementation, working with waste producers and suppliers

Alternative services

- Segregated waste and customer support services will be developed as part of the LLWR role as UK LLW implementation contractor for NDA
- Metals and combustibles treatments and VLLW disposal frameworks are to be set up as a minimum to support LLWR disposal optimisation and application of widespread, co-ordinated application of the WMH
- There is a presumption that centralised services are used to maximum effect where possible to ensure economies of scale can be achieved; this does not in any way preclude demonstration of alternatives by waste owners on a case by case basis when can be justified to offer greater value

Contingency planning

- Early planning for potential future contingencies such as replacement national repositories or other waste management assets will be evaluated and implemented
- Potential synergies with future programmes, including deep geological repository and new nuclear build strategies will also be considered

Future strategic triggers linked to implementation

- Implementation of LLWR Segregated Waste Treatment Services – 2009
- Issue of NDA LLW Strategy – 2010
- Submittal of LLWR Environmental Safety Case – 2011
- Approval of LLWR Environmental Safety Case – 2013
- Confirm Supply Chain LLW Treatment and Disposal Capability/Capacity
 - Metal recycling and treatment - 2013
 - Waste Compaction and Incineration - 2015
 - VLLW Disposal – 2012
- Commission LLWR Contingent VLLW Facility - 2015
- Delivery of LLWR Vaults
 - Vault 10 – 2019
 - Vault 11 - 2037
 - Vault 12 - 2057
- LLWR 2 Initial Siting Studies – Post 2050

**...what does this mean in
practice?**

(Strategy implementation)

Implementation

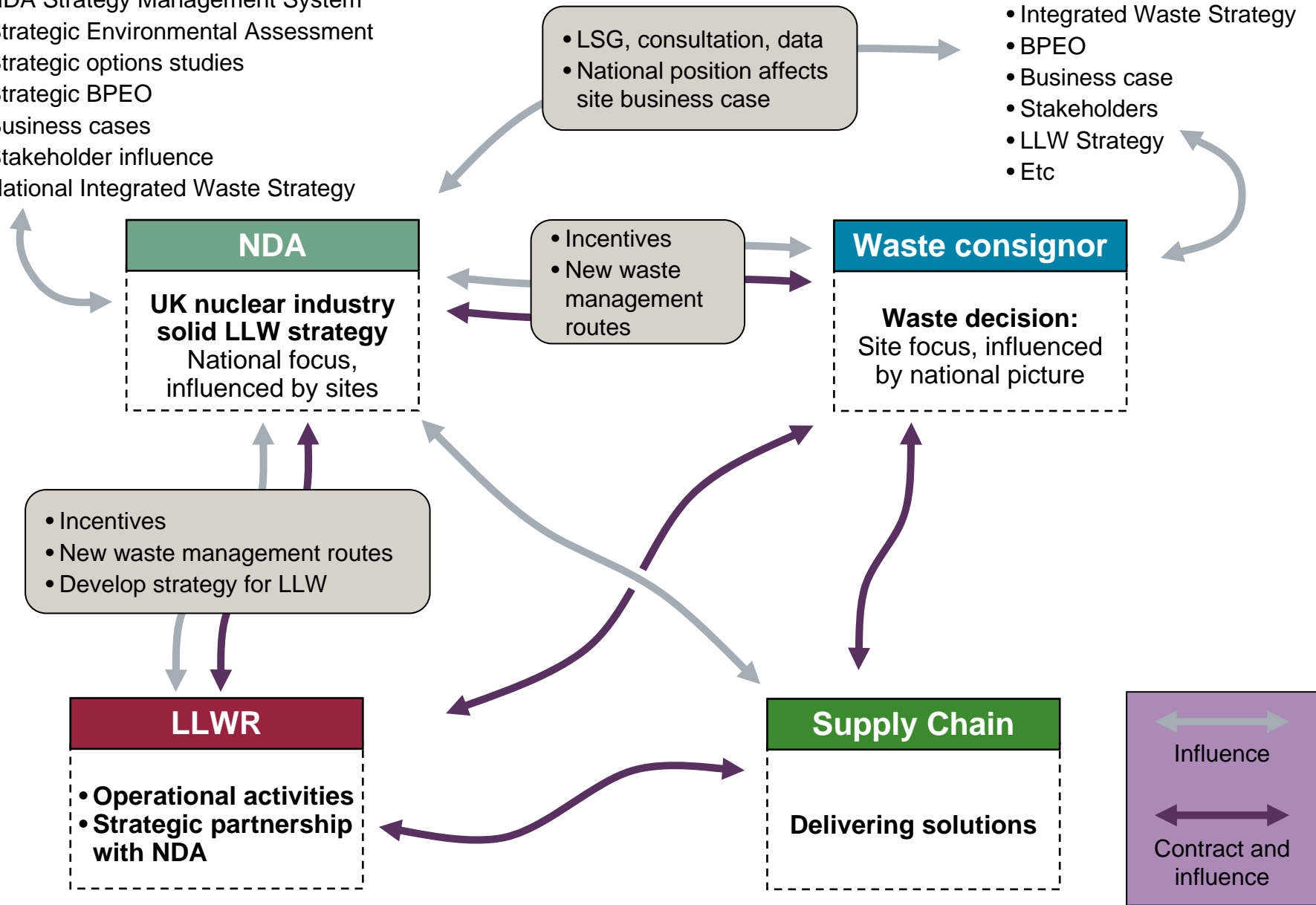
- UK LLW Management Plan
 - the detailed initiatives that help us implement this strategy – *more tomorrow...*
- Operational strategy for LLWR
- Driving the right behaviours and working with others
 - How it all fits together
 - Influencing
 - What we can and can't do...

Underpinning

- Strategic Review, Topical Strategies
- NDA Strategy Management System
- Strategic Environmental Assessment
- Strategic options studies
- Strategic BPEO
- Business cases
- Stakeholder influence
- National Integrated Waste Strategy

Decision making

- Integrated Waste Strategy
- BPEO
- Business case
- Stakeholders
- LLW Strategy
- Etc

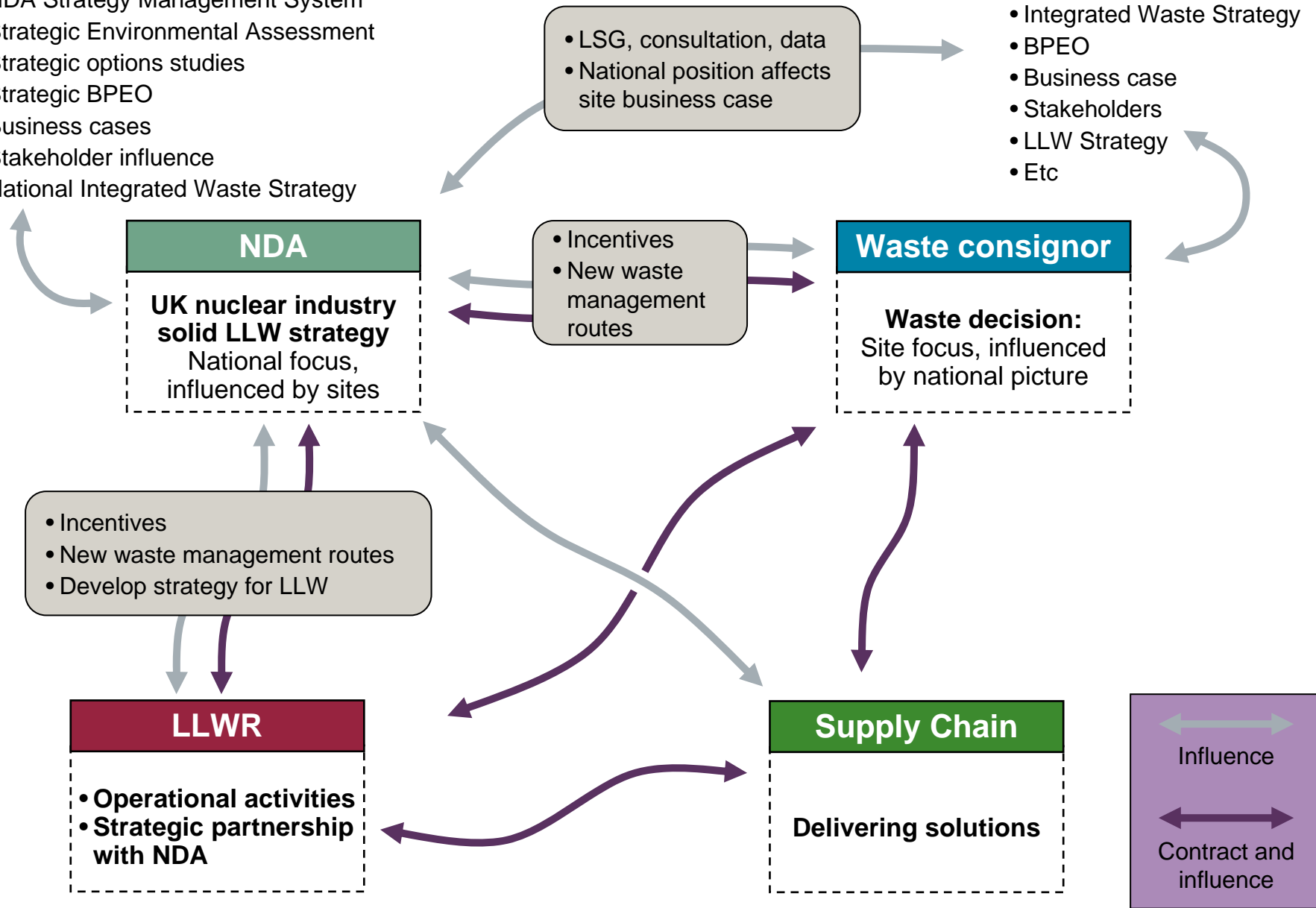


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- Etc



Implementation – key issues

- LLWR Environmental Safety Case
 - Submission – March 2011
 - Response – March 2013?
- Development of legislation
 - New Guidance on the Requirements for Authorisation for near surface disposal
 - Radioactive Substances Act, review of exemption orders
 - Authorisation and licensing issues associated to new disposal routes
- New build
 - Operators need confidence in waste management routes
 - Changes to the waste we will need to manage

Implementation – R&D

- The need to monitor on industrial scale to prove acceptability for release as exempt
- Innovation for sample minimisation, in-situ sampling, real-time sampling and mobile laboratories
- Best practice for data management and storage
- Development of techniques for remote sampling of contamination and waste
- Long-term monitoring methodologies (during institutional control period)
- Tool kit for sampling and interpretation of contaminated land

Implementation – other topics

- Waste categorisation and inventory
- Sharing good practice
- Consultation and public involvement

...what next?

Timescales

Jan - Feb	<ul style="list-style-type: none">• Develop first draft of strategy and undertake SEA appraisal
Feb	<ul style="list-style-type: none">• Next LLW Strategy Group meeting• Publication of LLWR's draft UK LLW management plan
Feb – Mar	<ul style="list-style-type: none">• Approval for publication of draft strategy for consultation
Apr	<ul style="list-style-type: none">• LLW strategy consultation document and SEA environmental report published
July	<ul style="list-style-type: none">• End of consultation period
July – Dec	<ul style="list-style-type: none">• Respond to consultation and finalise strategy• Approval by NDA Board and Government
Dec	<ul style="list-style-type: none">• UK nuclear industry LLW strategy published



Key deliverables

Deliverable	Target date	Owner
UK LLW Strategic Review	(Nov 08)	LLWR
Publication of UK LLW management plan	February	LLWR
Draft UK nuclear industry solid LLW strategy	April	NDA
Environmental Report for consultation	April	NDA
Final UK nuclear industry solid LLW strategy	End December	NDA
Revised Environmental Report	End December	NDA

Key aims

- Safety and environmental excellence
- Continued capability and capacity for the management and disposal of LLW
- Facilitate continued hazard reduction and decommissioning
- Best use of the UK Low Level Waste Repository
- Provide best value

Longer term expectations

- This is intended to be a dynamic strategy
- Gives clear strategic direction for now to deliver
 - maximum synergies across the UK
 - maximum flexibility
 - alignment for NDA sites via Site Strategic Specifications
- Allows for proportionality and affordability considerations and balance
- Strategic reviews undertaken every 2 years
- Annual UK LLW Management plan
- Strategy will be updated
- Policy  Strategy  Site plans