



PRISM – Utilising plutonium as an asset

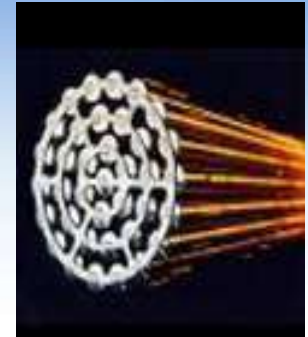
David Powell

Vice President Europe region
Nuclear Power Plant Sales

Future Energy Strategies Seminar, London
13th November 2012

Who we are . . .

The GE Hitachi Nuclear Alliance has been bringing innovation to the market for 50 years



Wilmington, NC
USA



Tokyo, Japan



Wilmington, NC
USA



Wilmington, NC
Yokosuka, Japan



Peterborough, ON
Canada

- Nuclear Power Plants, ABWR, ESBWR, and PRISM
- Nuclear Services
- Advanced Programs ... Recycling, Isotopes

- Uranium Enrichment ... Third Generation Technology

- Nuclear Fuel Fabrication ...BWR and CANDU
- CANDU Services
- Fuel Engineering and Support Services



GE Hitachi's solution for the UK's plutonium

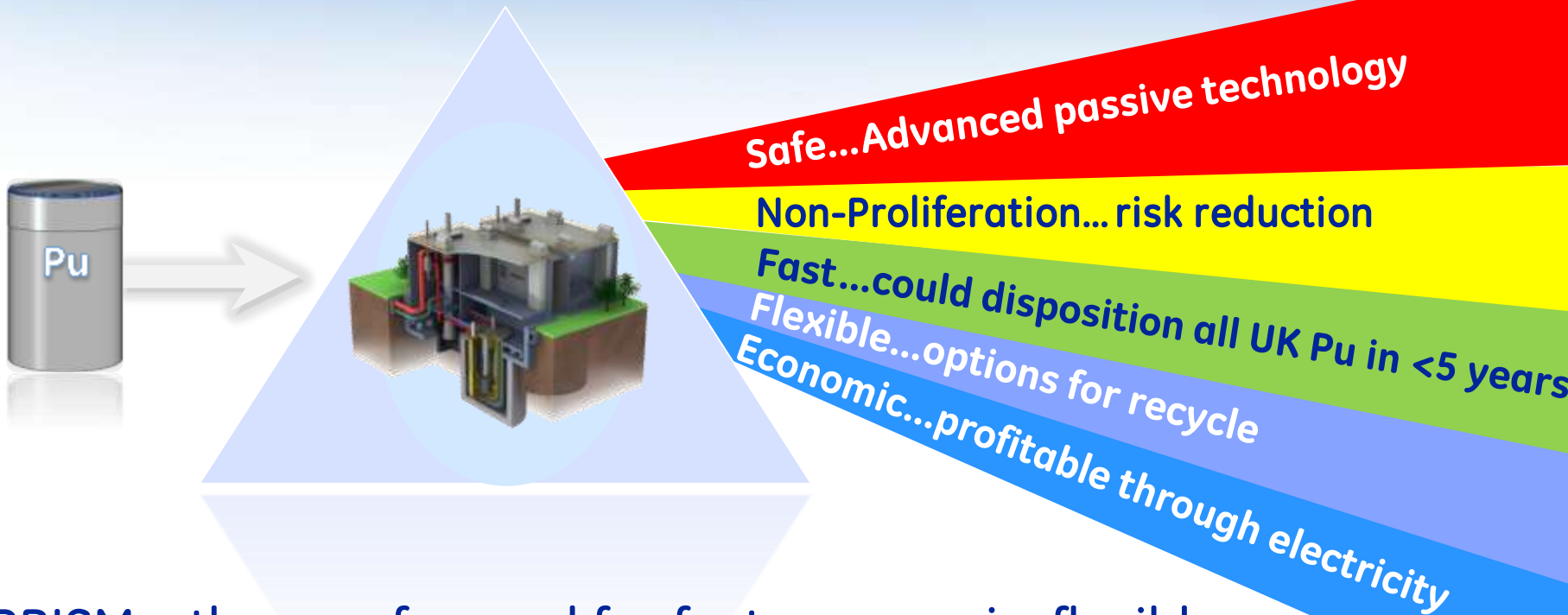
Disposition of the UK's plutonium



- The UK is storing the world's largest stockpile of civil Pu at 112t and growing.
- Public consultation run from February to May 2011.
- The UK Government has taken positive steps and announced its preferred policy of re-use in civil nuclear reactors.
- It “remains open to any alternative proposals for plutonium management that offer better value to the taxpayer”
- The solution needs to meet security and non-proliferation requirements and be affordable, deliverable and offer value for money.

Looking at plutonium in a different light

An integrated approach for plutonium disposition that directly generates low carbon electricity



PRISM – the way forward for fast, economic, flexible, plutonium reuse



Launch of GE Hitachi's solution

GE plans reactor to eat Sellafield waste

The Times, 27 November 2011

Revealed: new nuclear plant to tackle UK's plutonium mountain

The Independent, 3 April 2012

New generation of nuclear reactors could consume radioactive waste as fuel

The Guardian, 2 February 2012



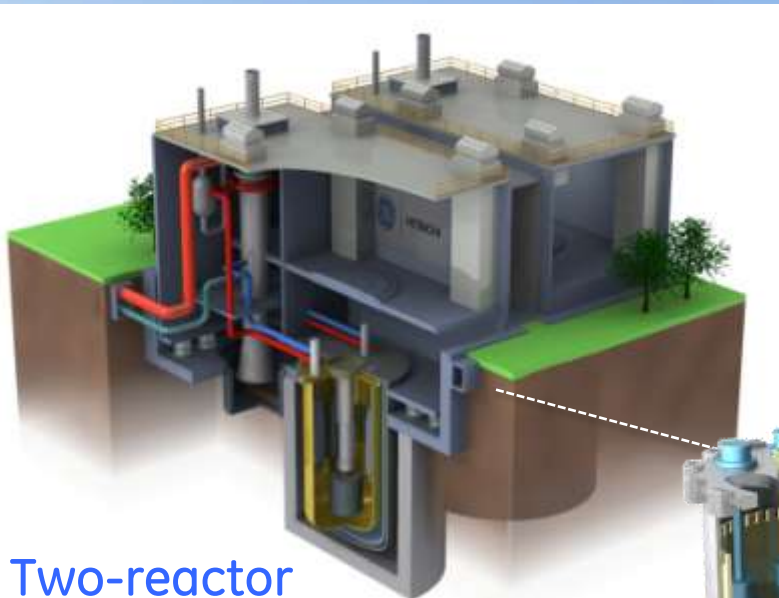
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Venture offers fast answer to Sellafield nuclear waste

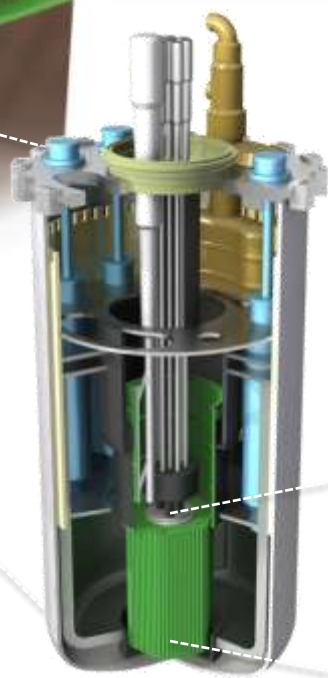
The Times, 29 November 2011

What is PRISM?

Power Reactor Innovative Small Module (PRISM)



Two-reactor power block



Metallic fuel is the key!

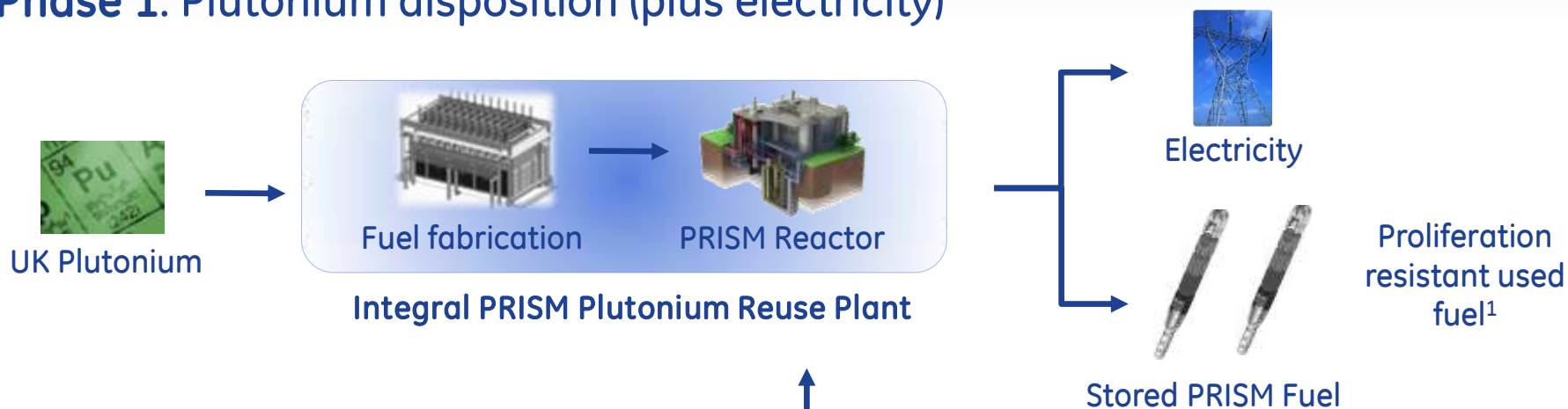
- Modular nuclear fast reactor 622 MWe (net)
- Can use all types of UK plutonium
- Features advanced passive safety systems
- Design prevents Loss of Coolant Accident
- Modular components allow for factory fabrication



PRISM Plutonium Reuse in UK

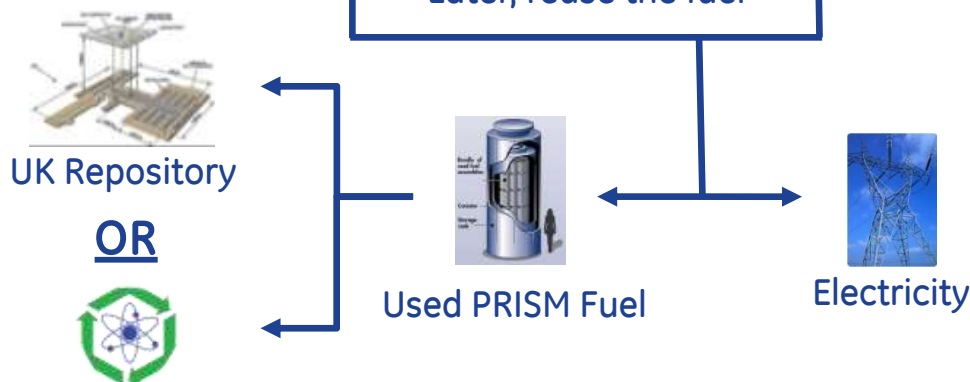
Convert plutonium to used fuel quickly... then reuse the fuel

Phase 1: Plutonium disposition (plus electricity)



Phase 2: Electricity

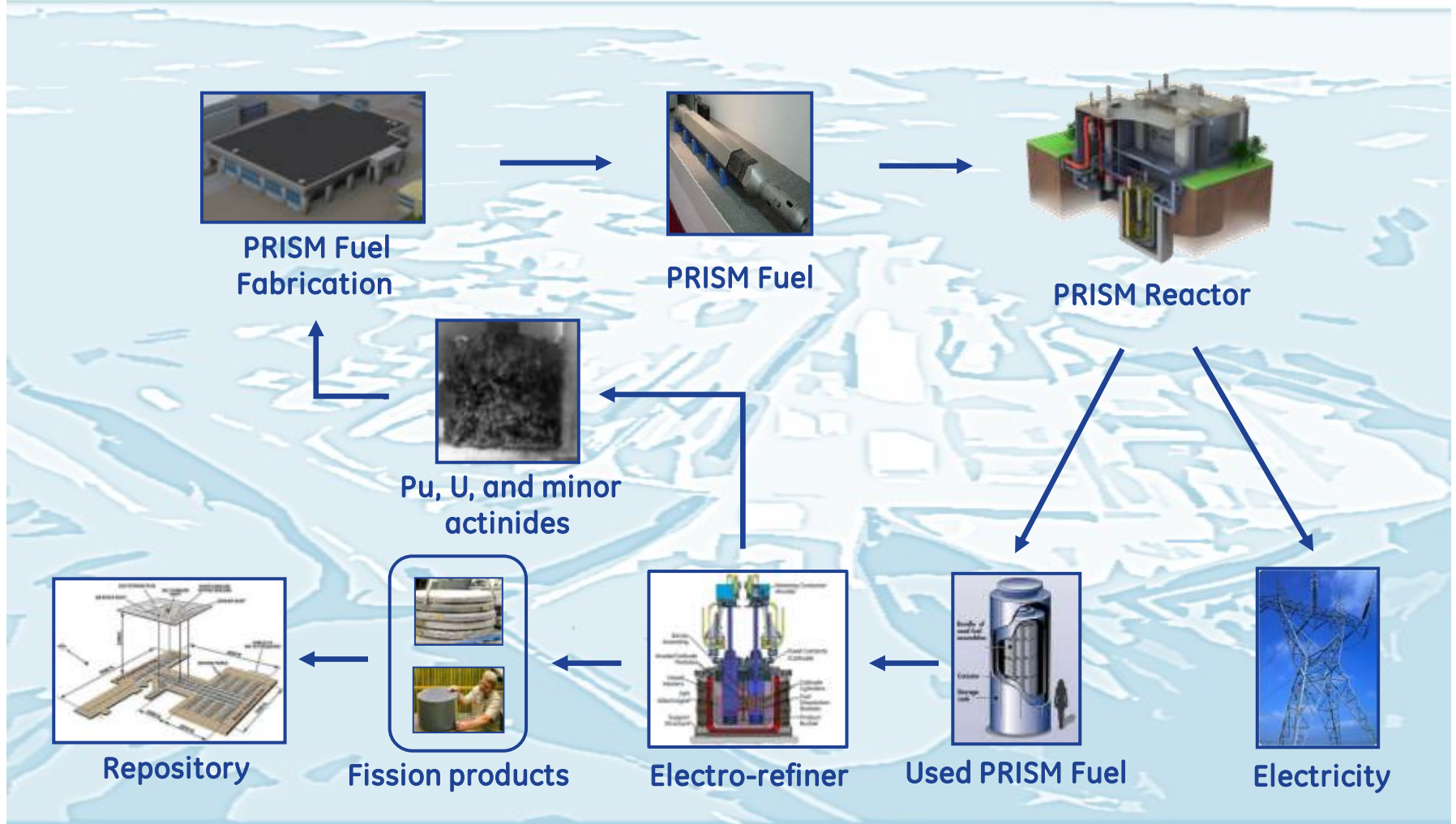
- Plant paid off
- Reuse the fuel
- Electricity focus



Optional advanced recycling²

Note 1: Meets or exceeds IAEA 100 Rem/hr at 1m standard for ~2 years depending on disposition rate.
Note 2: Sale of GEH US recycling requires specific prior US export controls authorization.

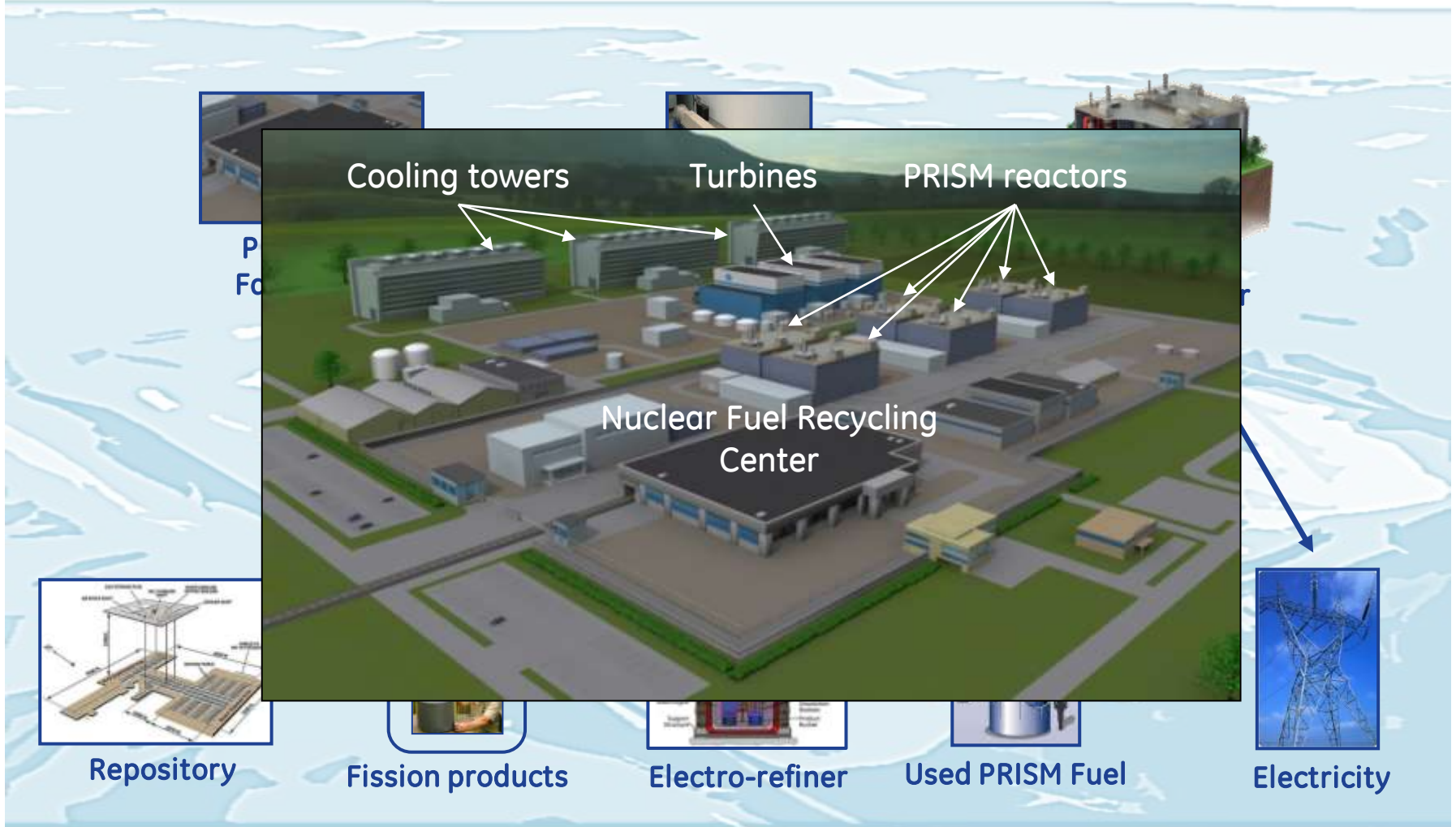
Extending PRISM... complete plutonium elimination



Sellafield site



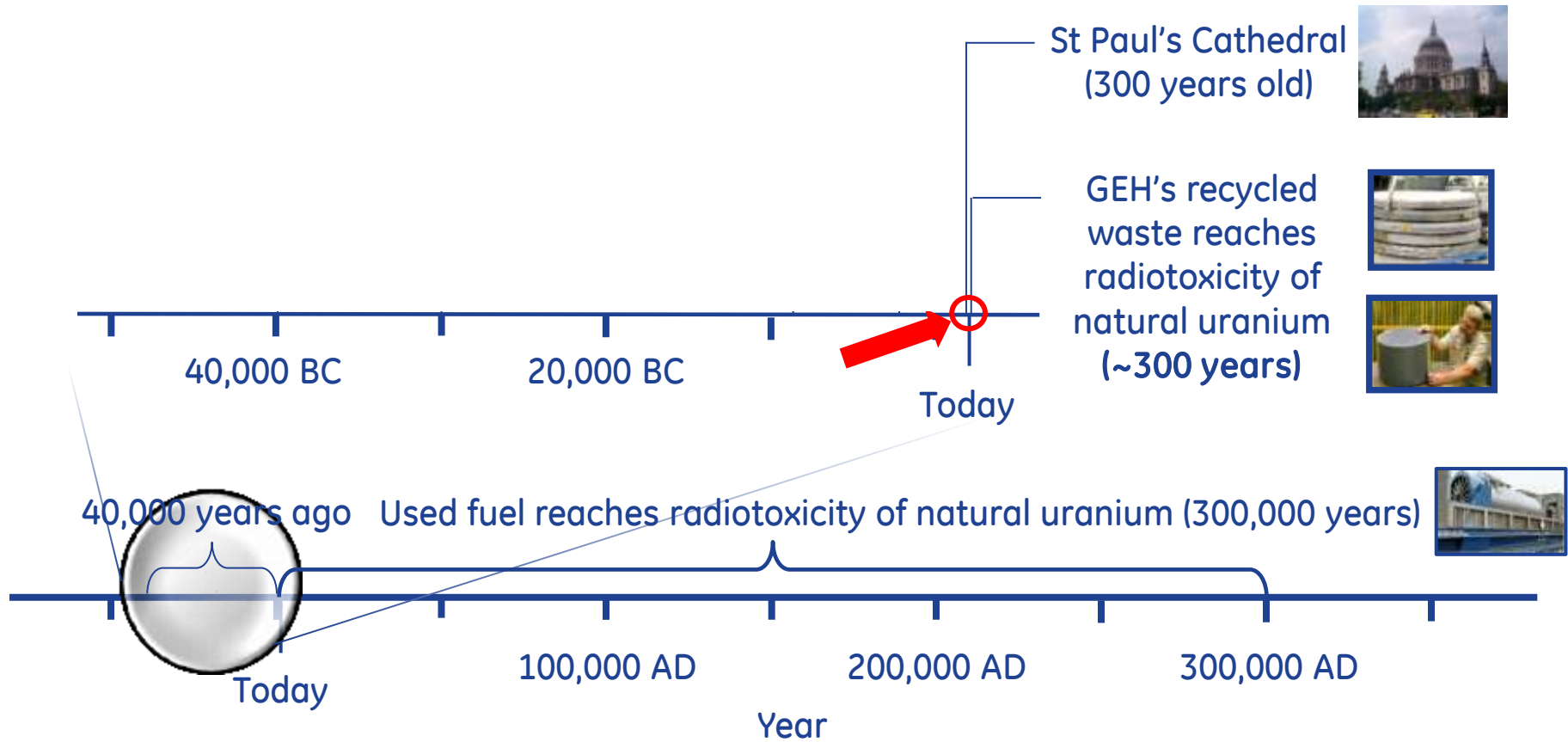
Extending PRISM... recycling used LWR fuel



Sellafield site



Putting decay time in perspective

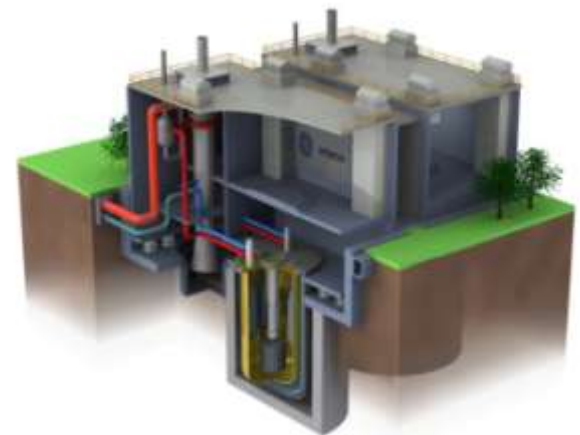


Benefits for the UK

An Opportunity for the UK

Embracing PRISM provides....

- Fast, economic and flexible Pu re-use generating low carbon electricity – a reactor and a fabrication facility.
- A local Sellafield solution.
- Sustainable UK job creation and a global centre of excellence.
- A pathway to re-engaging in an advanced technology and re-invigorating the UK's nuclear R&D.



What the UK's environmentalists are saying

Stephen Tindale, former Executive Director of Greenpeace:

"The PRISM reactor offered by GE-Hitachi (is) a fourth-generation fast reactor design which can generate zero-carbon power by consuming our plutonium and spent fuel stockpiles, thereby tackling both the nuclear waste and climate problems simultaneously; it is currently under consideration by the Nuclear Decommissioning Authority as a promising alternative to Areva's MOX fuel for plutonium management."

15 March 2012, "A Letter to David Cameron" (co-signed by George Monbiot, Fred Pearce, Michael Hanlon and Mark Lynas)

George Monbiot, environmentalist and writer:

"The technology with the potential to solve these problems (of climate change, future energy shortfalls and cleaning up nuclear waste) is the fast reactor, ideally the integral fast reactor (IFR) ... IFRs, once loaded with nuclear waste, can, in principle, keep recycling it until only a small fraction remains, producing energy as they do so."

2 February 2012, "We cannot wish Britain's nuclear waste away", The Guardian (blog)

Mark Lynas, environmentalist and writer:

"The most compelling reason to look seriously at the PRISM is that it can burn all the long-lived actinides in spent nuclear fuel, leaving only fission products with a roughly 300-year radioactive lifetime. This puts a very different spin on the eventual need for a geological repository."

1 March 2012, "UK moves a step closer to nuclear waste solution"



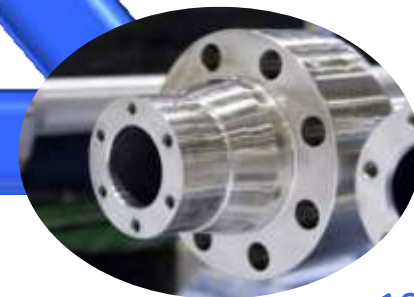
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The first PRISM supply chain event

- Held in West Cumbria on 4 April 2012 in conjunction with Britain's Energy Coast Business Cluster.
- Significant interest - over 100 attendees.
- Announced MOUs with NNL and Manchester University to provide expert technical input.
- Already working with the CAP Alliance.



Supply Chain
Localisation



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GE Hitachi submits Study report

theguardian

News | Sport | Comment | Culture | Business | Money | London 2012

Environment > Nuclear power

Nuclear waste-burning reactor moves a step closer to reality

Feasibility study shows GE-Hitachi's proposed Prism fast reactor could offer a solution to the UK's plutonium waste stockpile

Duncan Clark

guardian.co.uk, Monday 9 July 2012 18.18 BST



9 July 2012

GE Hitachi says Prism feasible, could be built in UK with US government support



[World's first nuclear waste-burning PRISM reactor moves a step closer in the UK](#)

9 July 2012

PRISM plutonium re-use provides value

- **Licensability** – independent assessment
- **Exportability** – US government support
- **Financeable** – US Export/Import bank support
- **Flexibility** – adapt to changing priorities
- **Centralisation** – Sellafield location
- **Commercial risk reduction** – pay for performance option
- **Electricity generation** – 622 MWe clean, green electricity
- **Socio-Economic value** – a local UK solution, creating jobs
- **Lower cost** – integral approach

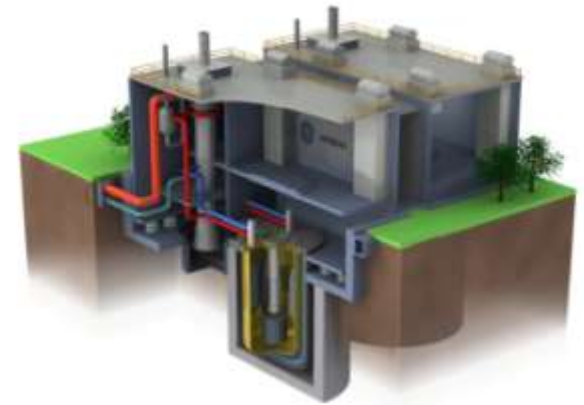


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Conclusions and Next Steps

GE Hitachi's PRISM - Why it provides a solution

- Addresses the nuclear legacy
- Provides value for the UK taxpayer
- Contributes to future energy security
- Provides sustainable UK jobs
- Opens future options for recycling
- Re-invigorates UK's nuclear R&D



Next Steps

- NDA progressing review of GEH feasibility study submitted on schedule on 5 July.
- Consultation on the process for justification of plutonium re-use – GEH provided a submission.
- A fair and transparent process should not exclude PRISM from the justification process in the absence of a competition at this stage.
- PRISM can deliver the best value in meeting the Government's and the NDA's policy objectives.
- We need to know the process that the Government/NDA will follow to ensure it is getting best value.

Solving big problems is at the heart of
what we do

*“I find out what the
world needs. Then I
go ahead and try to
invent it.”*

Thomas Edison
Founder, General Electric



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