Safety
Security
Safeguards
&
Decommissioning

"3S & D" By Design Approach in Prodigy's TNPP Program

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PRODIGY CLEAN ENERGY

Examples of non-traditional locations

New Mining operations
using coastal access

Advanced Fuels and Chemical Manufacturing
near large shipping ports

Islands & remote communities
looking for sustainable energy and opportunities to meet sustainable development goals

Data centres
at/near water accessible communication hubs

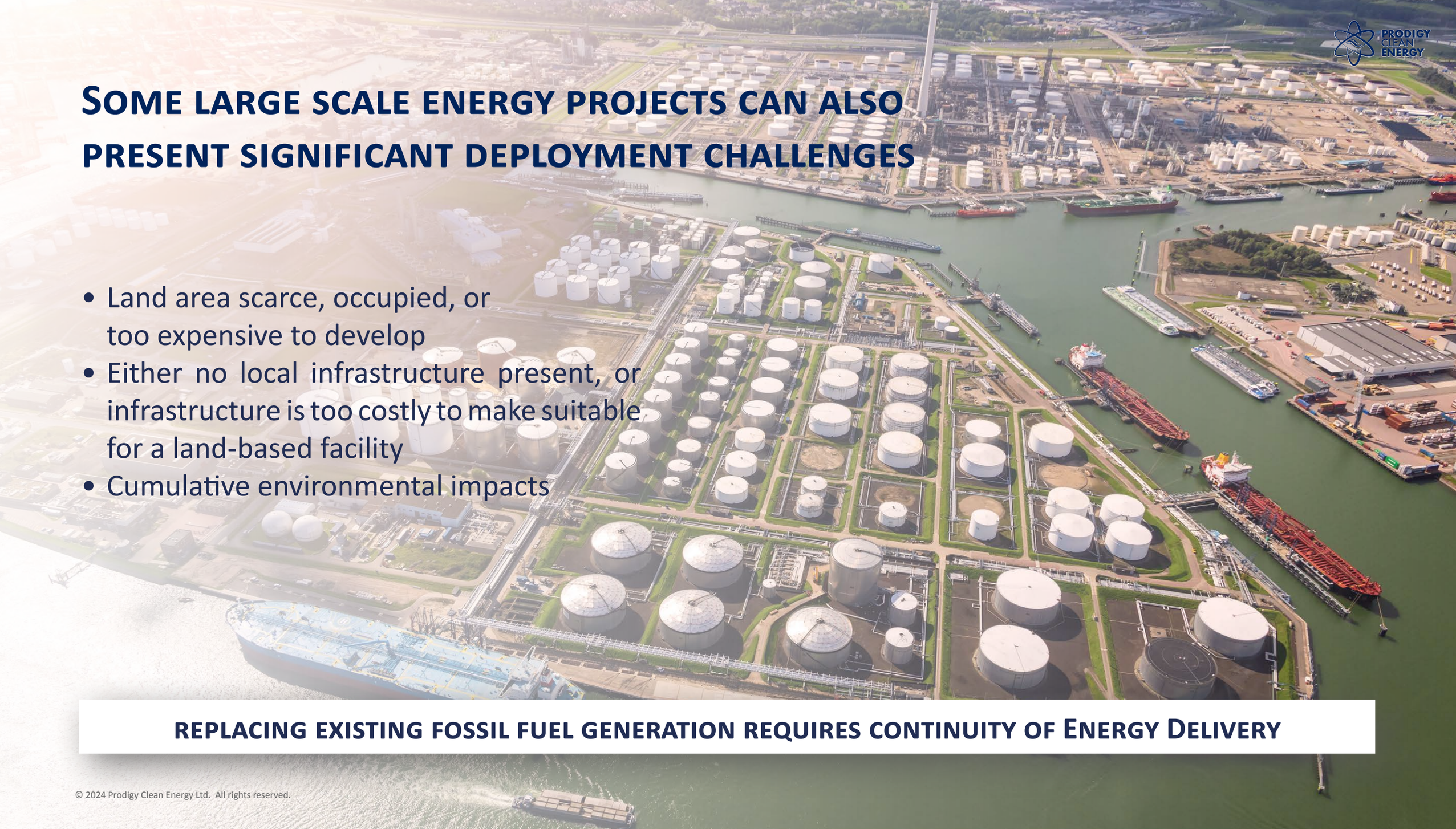
Building a nuclear plant in these locations can be expensive and logistically challenging!

Supplying energy to remote or undeveloped sites

- Isolated (located far from services).
- All infrastructure needs to be brought in (including workers and amenities for living).
- Challenging weather conditions and terrain.
- Seasonally available logistics (further impacted by unpredictability of climate change).

Note: Location shown for illustration purposes only.

Some large scale energy projects can also present significant deployment challenges



- Land area scarce, occupied, or too expensive to develop
- Either no local infrastructure present, or infrastructure is too costly to make suitable for a land-based facility
- Cumulative environmental impacts

Replacing existing fossil fuel generation requires continuity of Energy Delivery

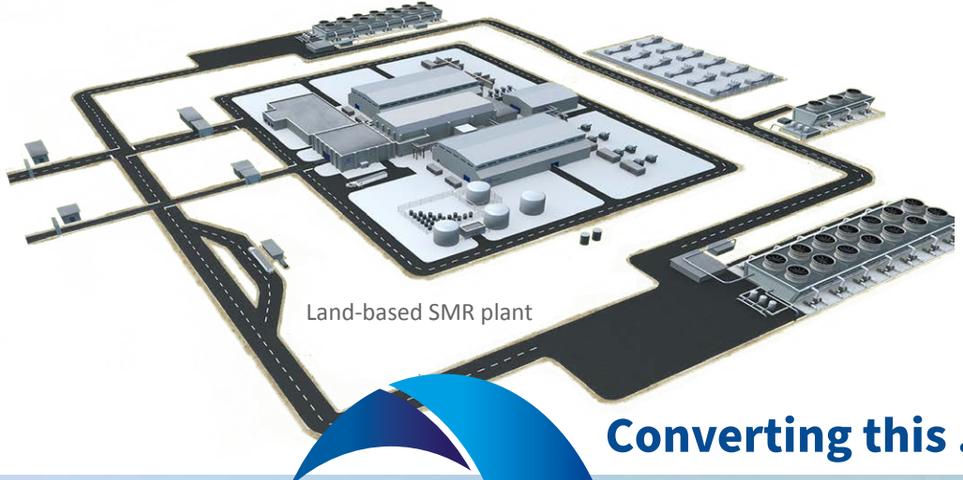
NON-TRADITIONAL LOCATIONS PRESENT NEW CHALLENGES

- **Safety and environmental protection:**
  - Effective and **TIMELY** offsite response to certain plant events is essential part of defence in depth - these locations can introduce significant delays
  - Achieving quality in site works becomes more complicated and expensive
  - Remote sites with pristine environments = **STRONG** public interest in environmental impacts
  - Crowded locations = public interest shifts to cumulative effects
- **Threat environment and types of threats can be different**
  - effective security response more difficult to plan
- **Conducting safeguards verification activities in infrastructure poor locations can be logistically complex.**

AN ALTERNATIVE WAY OF DEPLOYING NUCLEAR POWER IS NEEDED TO ADDRESS THESE CHALLENGES.

These challenges can be overcome by:

- Delivering & installing a fully outfitted and ready-to-operate SMR facility to a site where the energy is needed;
- at end of life, removing the facility from the site for decommissioning at a properly equipped facility;
- demonstrating that the above can be done safely, securely and cost-effectively;
- building public confidence that this approach can bring substantial societal benefits.



We work with Operators and SMR Vendors to enhance a land-based SMR configuration into one that can be marine transported for faster installation at a site anywhere in the world.

Converting this ...

...into this

A prefabricated and transportable SMR facility delivered to site

- Shipyard-manufactured
- Arrives to site fully assembled
- Significant reduction in CAPEX
- Delivered within ~2 years of order
- Minimal land requirement
- Small coastal footprint
- Dramatically reduced environmental impact
- Flexibility to relocate/redeploy
- Removed from site for decommissioning
- Standardized for serial production

Prodigy SMR Marine Power Station™
Concept design basis: ~1GWe gross output

"3S and D" by Design

Defense in Depth

- TNPP structures, systems and components combined with site infrastructure designed up-front to enhance Defense in Depth **SAFETY** provisions already present in the SMR configuration
- Added provisions for resiliency to address remote siting conditions

- **SECURITY** being integrated into design and facility operational provisions
- Working with SMR vendors to integrate **SAFEGUARDS** by design into plant

- Integrating modern waste management practices into the plant configuration:
  * Encourage reduction of potential wastes at the source.
  * Spatial planning done to include systems to treat, store, handle waste streams as appropriate to allow for transfer offsite to a waste facility

- Designing the TNPP for **EFFICIENT DECOMMISSIONING** and reduced legacy waste:
  * TNPP decommissioned in a centralized special purpose facility OFF-SITE.
  * Systematic de-construction sequence.
  * Materials planned in advance to maximize recycling and reduce volumes of hazardous and intermediate level wastes.
  * Will enable rapid site restoration and release from regulatory controls

Finding balance to keep lifecycle costs reasonable and predictable.

Meeting Regulatory Requirements

Methodologies and technologies being used by Prodigy are being implemented to be compatible with:

- ✓ **the current Canadian regulatory requirements and licensing processes**
- ✓ **the nuclear power plant and transport requirements of the IAEA**

Novel approaches are being carefully considered for legal impediments and the level of evidence needed to meet existing requirements. For example:

- working with SMR vendors with well advanced design programs.
- the first TNPPs will likely not be transported with fuel in the facility.
- first projects will be fixed location at-shore.

A shipyard approach to serial manufacturing and integration must still meet expectations for construction of structures systems and components for a nuclear new build project!

"3S and D" by Design Principles and Objectives **MUST** be Integrated into Management System

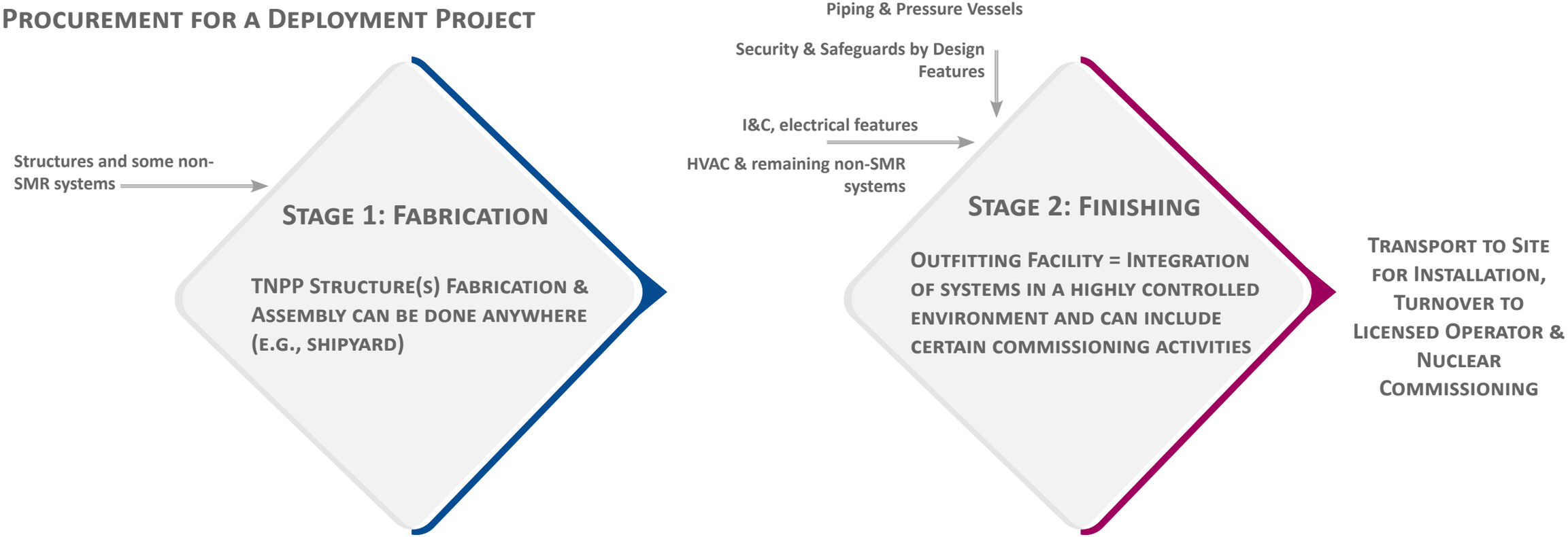
There will be additional incremental effort & up-front costs in design, but the end result is a better product with more predictable lifecycle costs.

- ✓ **Better planning and collaboration between disciplines** = Reduced conflicts between security, safety and safeguards provisions
- ✓ **Optimized system placement** = optimized security environment and improved maintenance
- ✓ **Clear path to efficient decommissioning** lowers decommissioning costs, waste costs and makes planning for long term waste management a bit easier
- ✓ **Lower decommissioning costs** = lower decommissioning financial guarantee fund needed!

Incorporating early operator input makes the power plant more user-friendly.

A SECURE ENVIRONMENT IN MANUFACTURING AND INTEGRATION

PROCUREMENT FOR A DEPLOYMENT PROJECT



- Must address regulatory requirements in country where TNPP deployment will occur
- Safety Classification informs application of appropriate industry practices and standards

- Activities subject to oversight by the specific deployment Project Construction Licence.
- High security!

CONTROL ACCESS TO SECURE AND SENSITIVE WORK AND SUPPORTING INFORMATION

Moving forward to deployment readiness…

Prodigy Development Program	***Transportable Nuclear Power Plants (TNPPs) for Fleet-Scale SMR Deployment***
Priority Areas - Complete R&D to be ready for a construction level design by 2030: **Focus is on Full Facility Lifecycle**	**Task 1:** Prove TNPP Concept can be ready for a manufacturing order by 2030 **Task 2:** Roadmap and Action Plan for TNPP and SMR Supply Chain **Task 3:** Indigenous Engagement and Input to a Deployment Case Study **Task 4:** End User/Operator Engagement and Input to a Deployment Case Study
Project Timeline	*On track to have designs ready by 2030 for a first facility Licence to Construct.*

Supported by the Government of Canada

Natural Resources Canada

Ressources naturelles Canada

"NRCan sees potential in Prodigy Clean Energy's Transportable Nuclear Power Plant (TNPP) platform concept as a technological tool to further expand the reach of SMRs into remote regions in Canada where traditional nuclear power plant construction methods may not be practical or economical."

Our program outputs also informing government policy work.

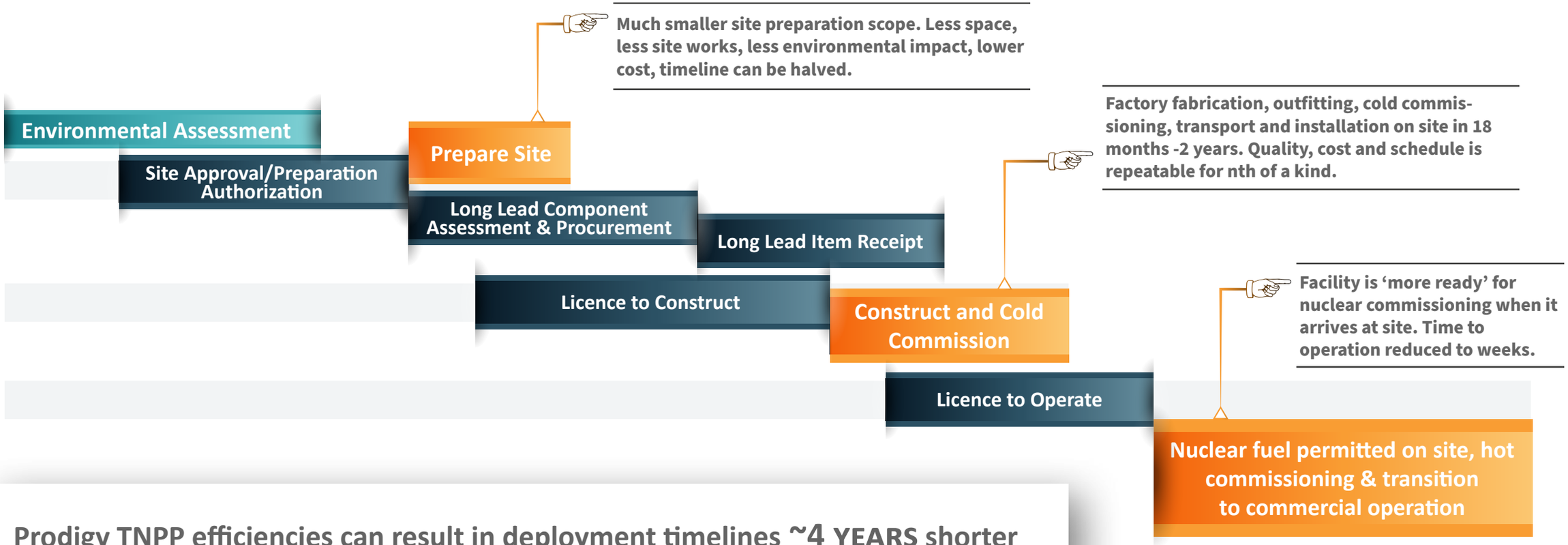
Using Case Studies to Inform Development Work

- **Considering locations that include mining, communities and other energy users**
  - SMR technology-neutral but drawing on features being used in real SMR designs.
  - Focuses the four program Tasks on understanding real challenges.
  - Understanding how to engage with Indigenous communities with rights to the lands the TNPP may be on.

- **Also addressing, for example:**
  - A Project Consortium Model including an owner/operator arrangement - to establish roles and responsibilities.
  - A description of an Enhanced Shipbuilding environment that incorporates nuclear construction requirements.
  - A clear-eyed discussion on addressing waste management and decommissioning.

Covers entire deployment lifecycle from a Project's inception to completion of decommissioning

A TNPP CAN ACHIEVE PROJECT EFFICIENCY GAINS



Prodigy TNPP efficiencies can result in deployment timelines ~4 YEARS shorter than an SMR constructed on site IN THE SAME SITING CONDITIONS.

Let us extend your opportunities to bring

Prodigy's goals are to meet the demands of today’s global energy markets and to mitigate the effects of climate change, through safer, lower-cost, and more flexible nuclear power deployment.

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