

Mitigating First-of-a-Kind Risk in SMR Deployment: Insights from Contracting Approaches

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INTRODUCTION

SMRs & FOAK Risk

Strong promise of SMRs

Yet first-of-a-kind (FOAK) risks could deter customers and financiers

Diversity among SMR projects

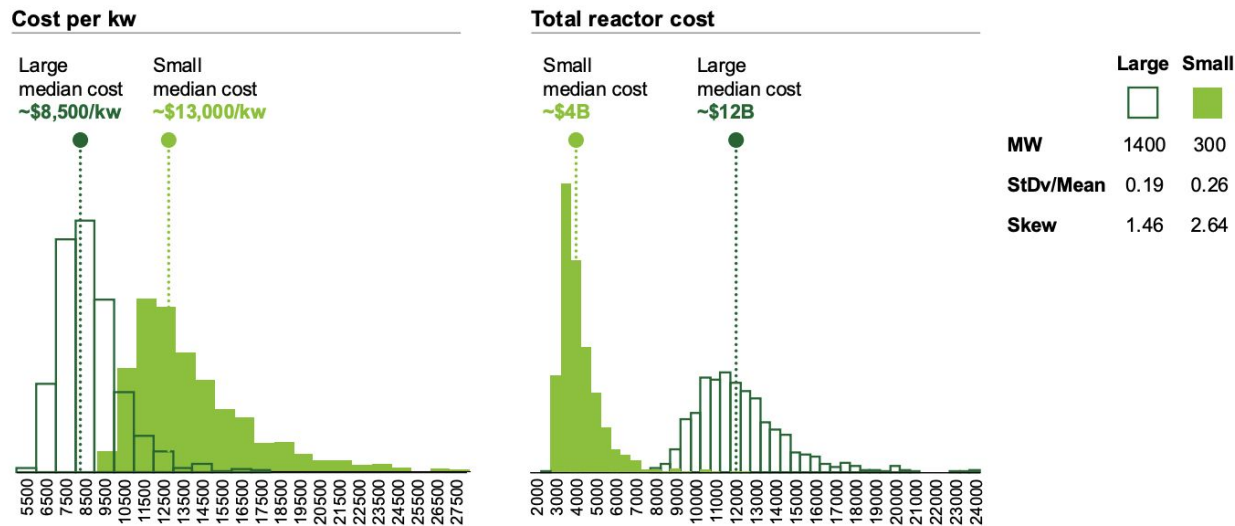
Different sizes & technologies require creative contracting approaches to alleviate FOAK anxieties



INTRODUCTION

DOE Pathways to Commercial Liftoff: Advanced Nuclear

Figure 23: Large reactors are cheaper \$/kw with narrower cost distributions, while SMRs may offer smaller overall project costs⁹³

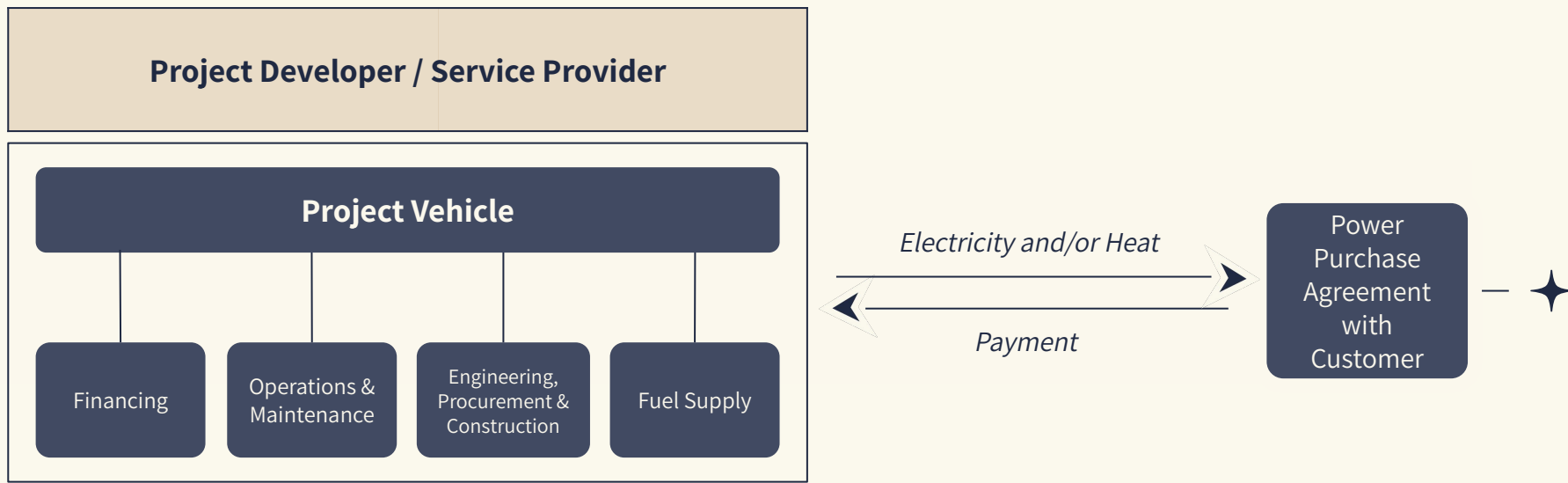


Note: these are modeled costs for large and small boiling water reactors; specific designs will have their own cost profiles that will vary

INTRODUCTION

Energy-as-a-Service (EaaS)

Project developers assume responsibility for capital for energy production and delivers the desired energy service. Customers pay for an energy service **without requiring any upfront capital expense**.



CONTRACTING STRATEGIES

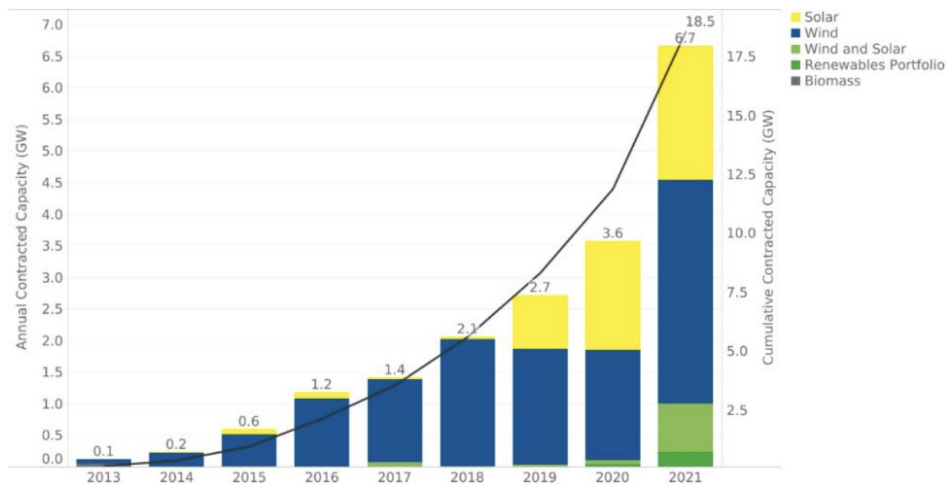
Energy-as-a-Service & PPAs

	Role of PPA	Alignment with EaaS
Financing Energy Projects	Third-party ownership of energy assets. Fixed-rate energy purchase agreement.	Offers predictable energy costs without upfront capital. Reduces financial burden on the customer.
Risk Management	Provider assumes performance and maintenance risks. Long-term agreements (10-25 years).	Ensures reliable energy supply with minimal customer risk. Supports long-term customer relationships.
Energy Efficiency and Optimization	Can be bundled with energy management services.	Provides a comprehensive energy solution.
Scalability and Flexibility	Allows for modular and scalable energy solutions.	Adapts to changing energy needs over time.
Innovation and Technology Integration	Access to latest energy technologies.	Offers advanced solutions without customer ownership risk.

CONTRACTING STRATEGIES

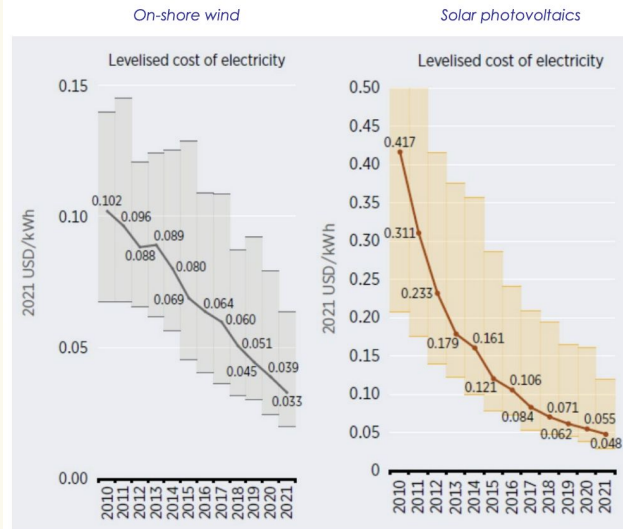
Evolution of the Renewables Industry: PPAs and LCOE

Graph 4.1 Evolution of corporate renewable PPAs in Europe by year and renewable technology



Source: RE-Source Platform (2022) – Renewable Energy Buyers Toolkit.

Graph 5.1 Evolution of the levelised cost of electricity for onshore wind and solar photovoltaic electricity from 2010 to 2021 at global level.



Source: reproduced from IRENA - Renewable Power Generation Costs in 2021.



Benefits of Nuclear PPAs for Customers & Developers

Stability for Customers

24/7 carbon-free power supply and protection from energy price volatility

Unlocking Private Investment

PPAs may be more attractive to corporate energy buyers and private industrial customers

Revenue Certainty

Locked-in energy prices allow developers to invest confidently

Flexibility for Developers

Potential for physical or virtual PPA structures allows for flexible siting

CONTRACTING STRATEGIES

Nuclear PPA Models

	Physical Nuclear PPA	Virtual Nuclear PPA	Renewables PPA
Access to 24/7 carbon-free power supply	✓	✓	X
Ability to track time matched scope 2 emissions	✓	✓	X
Protection from energy price volatility	✓	✓	X
Protection from grid instability	✓	X	X
Ability to bypass grid connection supply challenges	✓	X	X

OUTSIDE INFLUENCE

Role of Governments in Nuclear Financing

- Setting policies
- Offering financing and funding
- Government as a customer

Policies directly impact opportunity for EaaS strategies

- Utility market structure (e.g. regulated, liberalized)
- Limits on PPA term lengths for government agencies



OUTLOOK

Implications and Potential Challenges

Bankability

Security of PPAs may make SMRs more attractive to investors, address risk appetite of financial institutions

Term length

Developers will need to find alignment with the lifetime of the power asset and the PPA term length

Role of project developers

Many technology vendors but not enough project developers; vendors must take on a project developer role and try new business models to move projects forward



Thank You!



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