

**The Importance of Considering Contracting Strategy Early:  
comparison of EPC-EPCM-IPDA contracting arrangements**

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Thank you for the opportunity to submit a statement to the Nuclear Power Committee in support of its investigation of the possible future establishment of nuclear power in Norway.

A key factor to the success of a nuclear new build project will be the contracting structure used to deliver the project. The contracting structure allocates the project risks among the various parties, and establishes the controls and frameworks to prevent cost overruns and schedule delays, to achieve the ultimate goal of delivering a new nuclear power project on time and on budget. As a result, the contracting strategy should be considered early, ideally at the same time as nuclear reactor technology selection.

Determining which contracting model best suits a particular project will depend on certain key factors, including:

1. What is the maturity of the design of the selected nuclear reactor technology?
2. With respect to the selected nuclear reactor technology, will this project be one of the first deployments of this particular technology, or “nth” of a kind?
3. What is the preferred risk allocation of the project owner (Owner)?
4. What is the Owner’s and the Contractor’s experience with large power projects?
5. What is the Owner’s preferred level of control and involvement in the day-to-day activities of the project?

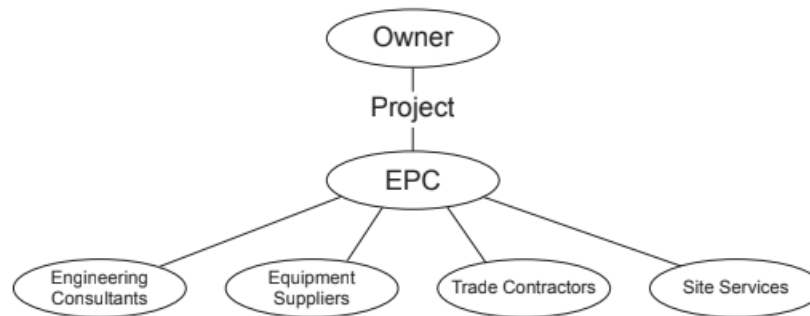
This submission will provide an overview and present “pros” and “cons” of three (3) different contracting structures: (a) the traditional engineering, procurement and construction (EPC) structure, (b) the engineering, procurement and construction management (EPCM) structure, and (c) the integrated project delivery agreement (IPDA). EPC agreements and EPCM agreements have historically been the most common contract structures used for delivery of nuclear new build projects, but the IPDA is currently generating a lot of interest for project owners and developers who want a different project delivery model. Certain utilities in North America are actively pursuing the IPDA model for their nuclear new build projects, such as Ontario Power Generation (OPG) in Canada, and the IPDA strategy is under consideration by other owners and project developers globally.

In a typical EPC agreement, the Contractor provides turnkey services, often for a lump-sum fixed price, to complete a project with responsibility for all aspects of that project other than certain defined Owner obligations (such as permits that must be acquired by the Owner, real estate, utilities).

In a typical EPCM agreement, the Contractor is providing construction management services (with Owner input and feedback) that encompass engineering, procurement management and management of construction contractors who are under separate contract with the Owner.

In the Hunton IPDA, the IPDA is the core project delivery agreement. It is a multi-party teaming agreement entered into by the Owner, construction contractor, and the technology provider. It may also include other key project participants as appropriate for the particular project (e.g., Owner's engineer, offtaker, fuel supplier, major equipment supplier). A series of streamlined project agreements are then entered into between the Owner and each key project participant.

### **THE EPC STRUCTURE**



#### **PROs:**

- Single point of contact and responsibility; less complex contract structure and less contract administration by Owner.
- Risk allocation, and accountability for schedule, cost and performance placed substantially on Contractor, including responsibility to deliver a completed project.
- Contractor bears responsibility for integrating the elements of the project (i.e., the Contractor must manage interfaces and fill any gaps that may arise among subcontractors and suppliers to take overall project risk), taking overall liability with a fixed price for liquidated damages for performance guarantees and completion guarantees, and providing greater certainty with respect to schedule and cost.
- Streamlined dispute resolution between Owner and Contractor only. Owner is typically not on the “front line” of disputes between Contractor and subcontractors or suppliers.
- Clearer lines of liability residing with the Contractor.

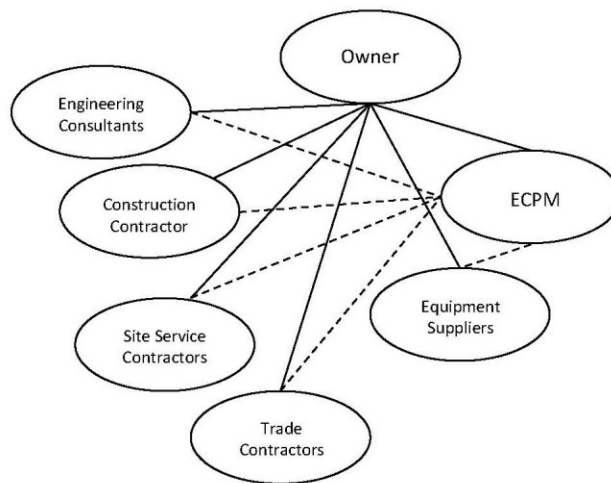
#### **CONs:**

- Detailed specificity required for Contractor obligations, making the EPC model better suited for “Nth-of-a-kind” deployment.

- Because the Contractor bears more risk, including the risk of equipment suppliers, an EPC is expected to be a higher cost contract.
- Less transparency to and input from Owner for decisions made by the Contractor in the performance of Contractor's obligations.

### **THE EPCM STRUCTURE**

For this diagram, solid lines reflect contractual privity and dash lines reflect a management relationship.



### **PROs:**

- Provides flexibility so that the contracting structure is able to address first-of-a-kind deployment, where technology design is not mature and requires further development.
- Allows Owner to be involved in construction and design management of a project alongside the EPCM contractor.
- Contracting strategy and selection of contractors remains with Owner.
- Expected to be lower cost contract compared to EPC, as Owner should avoid paying large EPC profit/risk premium.

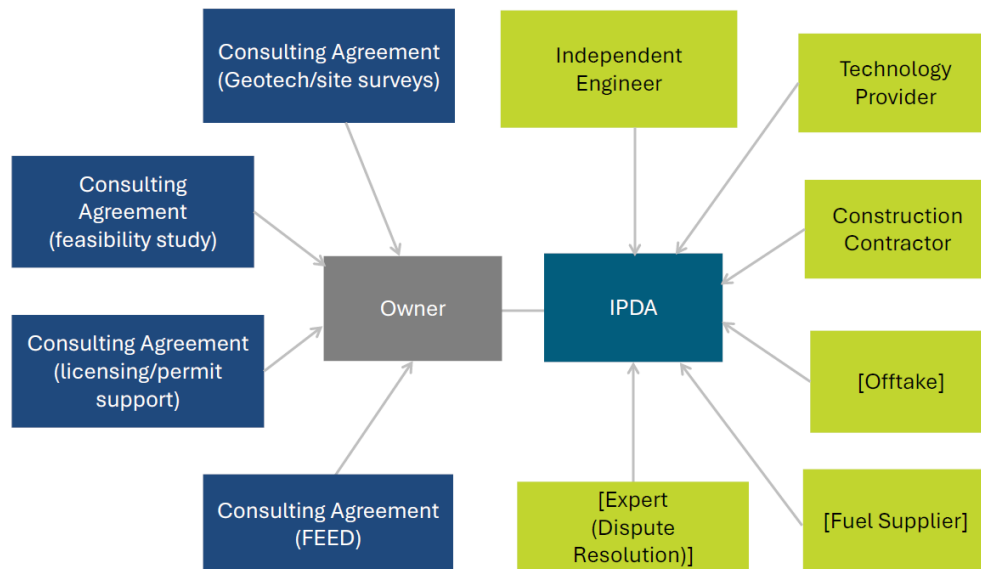
### **CONs:**

- Multiple points of contact; more complex contract structure, and more complex and resource intensive contract administration by Owner, creating risk of miscommunication.
- Separate vendor and construction contracts are needed, in addition to the EPCM agreement, to perform actual equipment supply and construction work.
- EPCM contractor does not take overall responsibility for project cost or schedule (except due to its own negligence, willful breach or fraudulent behavior). Risk allocation for schedule, cost and performance remains with Owner.

- Interface management needed on 4 fronts: physical, functional, contractual and organizational.
- Requires Owner to have a sizeable, experienced in-house team for the project. Initial cost savings can be eliminated if in-house support is insufficient.
- Requires additional agreements and procedures to achieve delivery of project, including (but not limited to): multiparty interface management agreement, template agreements for use with other contractors and suppliers, and a communications plan.
- Little or no performance, schedule and cost guarantees from EPCM Contractor. Owner will need to look to individual subcontractors and suppliers.
- Dispute resolution is typically more complex. Issues can include: determining responsibility for failure, cross claims and liability, difficulty identifying root-cause of a testing failure and allocating appropriate remedies for that failure, centralization of all disputes, and allocation of liability across multiple entities. Owner will be on the “front line” of any disputes with subcontractors or suppliers.

### THE IPDA STRUCTURE

For this diagram, blue rectangles illustrate preliminary activities to be undertaken by Owner, prior to signing the IPDA, and green rectangles illustrate possible streamlined project agreements to be entered into to supplement the IPDA.



### PROs:

- Takes a holistic, collaborative approach to project development and delivery.

- Provides a higher degree of design, schedule and cost certainty by following a phased approach to project development and execution, with each phase including defined activities and conditions precedent which must be met in order to proceed to the next phase.
- Coordinates with the financing element of a project, by building in points for the interim investment decision and the final investment decision.
- Maintains a collaborative team among the key project participants by creating a set of common terms (customizable for each particular project) which remain in effect for the duration of the project.
- Shares risk among Owner and the key project participants by creating a risk pool, to which each party's contingency (and/or profit) can be allocated.
- Allows Owner to be involved in construction and design management of the project alongside all key project participants.
- Contracting strategy and selection of contractors remains with Owner.
- Develops knowledge that Owner may utilize for adding future units or additional projects utilizing similar technology.

CONs:

- Requires Owner to expend more time and effort at the front end of a project for planning and project development, before commencement of construction.
- Separate vendor and construction contracts needed, in addition to the IPDA, to perform actual equipment supply and construction work.

Finally, note that the contracting strategy does not need to be an “either-or” decision. For example, elements of the IPDA, such as the risk pools concept, can be built into an EPC agreement if an Owner prefers the EPC contracting arrangement. Ultimately, the most appropriate contracting strategy will be a project-specific decision, taking into account Owner's experience, preferred degree of involvement and control, and preferred risk allocation, together with the maturity of the selected nuclear reactor technology and the frequency of its deployment.

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The Hunton nuclear team has extensive experience supporting owners on the development and financing of nuclear new build projects globally, both in countries that are new to nuclear, with a need to develop the regulatory and licensing framework as well as the nuclear reactor project, and in countries with a long-standing civil nuclear industry. We have supported and are currently supporting nuclear new build projects utilizing all of these contracting structures. For more information, please contact:

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