



ALTERNATIVE DELIVERY MODEL TO EPC

REALLOCATING RISK TO REDUCE COST

*Circular Solutions Engineering Procurement and Construction
Management Capability Statement – 4 June 2020*

TABLE OF CONTENTS

Contents

Contents	1
1. Circular Solutions	2
2. EPC vs EPCM	3
3. EPCM Scope	5
4. References	2

IMPORTANT NOTE

The content of this document relies heavily on documents in the References. This document is an interpretation and complication of the reference works and content has been added.

For further discussion on how this model can apply to your power project please contact us by email at the following address: info@circularsolutions.com.au.

1. Circular Solutions

Circular Solutions is a specialised renewable energy consultant and contractor. Our services include:

- Concept development including feasibility, design, strategic planning, and regulatory advice;
- Project delivery as a turnkey or EPC contractor, as in house project and contract management for the owner, or as a fully financed (BOO) solution.

Our team are specialists in:

- Concept design and specification of micro-grid and island power systems;
- Detailed design and project delivery of renewable energy projects with significant experience in remote locations; and
- Systems integration and commissioning including thermal power and batteries.

Because we are a consultant and a contractor, we are uniquely placed to provide practical advice to our clients and partners based on current costs and on-site experience.

For more information about Circular Solutions, our team, capability and experience please visit our website www.circularsolutions.com.au.

To contact us to discuss your renewable power projects please email the team at info@circularsolutions.com.au.

2. EPC vs EPCM

ENGINEERING PROCUREMENT AND CONSTRUCTION (EPC)

In the last 10 to 15 years the main contracting structures have included some form of fixed time and cost arrangement. These include:

- Construct only
- Design and construct
- Engineering, Procurement and Construction (EPC)

The advantage of these structures is that they aim to provide certainty on the time and cost of the construction work. The added advantage of the EPC structure is that there is a single source of responsibility for the whole project including final engineering and construction.

Because the EPC contractor carries the majority of the risk and provides a guarantee that they will deliver at a fixed price, the certainty provided with an EPC contract improves the ability for the owner to secure finance.

The draw back to this form of project delivery structure is that it is necessary for the contractor to include a risk premium in the contract price.

ENGINEERING PROCUREMENT AND CONSTRUCTION MANAGEMENT (EPCM)

In the Engineering Procurement and Construction Management (EPCM) model, an experienced Contractor manages all aspects of the delivery on behalf of the owner in a similar manner to the EPC structure. However, in the EPCM model the owner retains overall responsibility and the majority of the project risk. This approach allows the Owner to avoid paying large risk premiums and margin to the contractor resulting in a cost reduction of the build.

The EPCM approach also allows Owners to involve Contractors in the development process much earlier than in the EPC approach, where the competing tenders are kept at arm's length and Consultants help the Owner (developer) with the project definition and design. Involving the Contractor early has the advantage of bringing an understanding of sub-contract pricing and constructability issues to the development process. Involving the Contractor early also allows to the Owner to build confidence in the Contractor's ability to deliver.

EPCM CONTRACT STRUCTURE

In its simplest form, an EPCM Contract is a consultancy, procurement and supervision agreement for the provision of professional or technical services. At one end of the spectrum, an EPCM could be considered to be a pure consultancy-type arrangement and, at the other end, an integrated EPCM Contract could look more akin to an integrated alliance style contract.

EPC VS EPCM

The EPCM Contractor is typically responsible for:

- Design
- Procurement including:
 - Sourcing
 - Scopes of work
 - Contract negotiation
- Contractor management
- Quality Control and Assurance
- Safety Management
- Site Management
- Project Management:
 - Scope management
 - Cost Management
 - Integration management
 - Communications management
 - Resource management
 - Risk Management
 - Program management
 - Construction Supervision

Traditionally, the construction and procurement agreements for the project were managed by the EPCM Contractor, with the agreements being signed by the Owner directly. Depending on the project structure, the Owner and the industry, the EPCM Contractor may enter into contracts directly with Contractors and suppliers, as agent for the Owner, (with the EPCM Contractor assuming no or limited liability under such contracts). Where this is the case, there are generally clear procedures and limitations on the EPCM Contractor's ability to execute such contracts.

EPCM Contractors usually do not take full responsibility for:

- delivery of the project by certain key milestone dates
- care and custody of the works (with certain exceptions for arranging security and management of safety etc.)
- the project being delivered in accordance with the project budget.

The EPCM Contractor is usually heavily incentivized to bring the project to commercial operation on time and under budget, but is not required to indemnify the Owner for failing to do so.

EPCM CONTRACTOR LIABILITY

Depending on the scope of services to be provided by the EPCM Contractor, potential liabilities may relate to wilful default, fraudulent behavior and, after some form of negligence or recklessness, in respect of matters such as:

- performance of the design and engineering
- preparation of the project budget and project schedule
- management of procurement, including a failure to implement an objective and competitive tender process
- management, administration and supervision of the work packages
- coordination of the design and construction works between works package Contractors.

EPC VS EPCM

Ordinarily, the maximum liability of the EPCM Contractor is much lower than is usually the case under fixed time and cost arrangements. It is often limited to the correction of defective services and capped out at between 5-20% of the total EPCM remuneration (or, more recently, to the value of the profit and sometimes the overhead component as well). There are generally a number of carve-outs from such a limitation, including for losses resulting from fraud or wilful misconduct. Obviously, these arrangements depend on a number of factors and vary widely from project to project.

Table 1 – Comparison between EPC and EPCM (Reference: [Slideshare](#))

Project Area	EPC	EPCM
Accountability	Contractor fully accountable	Owner has multiple points of accountability, including options to review, inspect and approve.
Risk	Contractor holds risk	Owner holds risk
Time	Fixed date for completion	No liability to meet completion schedule. Reputation and or incentive provide the drive to deliver on time and budget
Price	Fixed price contract	Schedule of rates / Cost plus for the construction. EPCM services can be on a rates basis, fixed basis or a combination of both.
Procurement	Contractor responsible for procurement	Procurement contracts can be directly with the Owner or with the Contractor acting as an agent for the Owner.
Quality / Performance Guarantee	Contractor guarantees performance of completed facility	Contractor does not provide performance guarantees
Owner's Involvement	Contractor in control	Owner in control
Defective works / services	Contractor to rectify any defects	Assists Owner to manage rectification of defects

3. EPCM Scope

Through our team and partners Circular Solutions can deliver a full service EPCM offering.

Because we are an EPC contractor as well as a consultant, we have an understanding of project risk that can only be gained from project delivery. We specialize in the integration of complex projects with multiple stakeholders.

The Sections below provide a high-level list of the services that Circular Solutions offers as an integrated solution. These services can be provided on a fixed price or rates basis, or a combination depending on the scope and the client's risk allocation.

DEVELOPMENT PHASE SERVICES

- Development Approval, Community and the Environment
 - Community engagement
 - Indigenous Engagement
 - Environmental and Heritage
 - Geotechnical investigation
 - Development approval
- Solution Engineering
 - Design optimization
 - Generation design
 - Network design
 - Communications and Control design
 - Current and future system load assessment
 - System stability studies (GPS)
- Operating models
 - Cost assessment
 - Commercial
 - Risk management
 - Financial model
 - Billing models
 - Sources of funding
 - Project plan and budget
 - Feasibility Report

DELIVERY PHASE SERVICES

- Design
 - Civil
 - Structural
 - Electrical
 - SCADA
 - Studies
- Procurement including:
 - Sourcing
 - Scopes of work
 - Contract negotiation
- Project Management:
 - Scope management
 - Cost Management
 - Integration management
 - Communications management
 - Resource management
 - Risk Management
 - Program management
- Contracts and Contractor management
- Quality Control and Assurance
- Safety Management
- Site and Construction Management

REFERENCES

4. References

PWC paper “EPCM Contracts: Project delivery through engineering, procurement and construction management contracts”. The original document is available on the PWC website www.pwc.com.au.

IFC paper “Utility Scale Solar Photovoltaic Power Plants – A Project Developer’s Guide”