

# Construction Management Task Force Workshop #1

26-March-2012

Boundless Energy



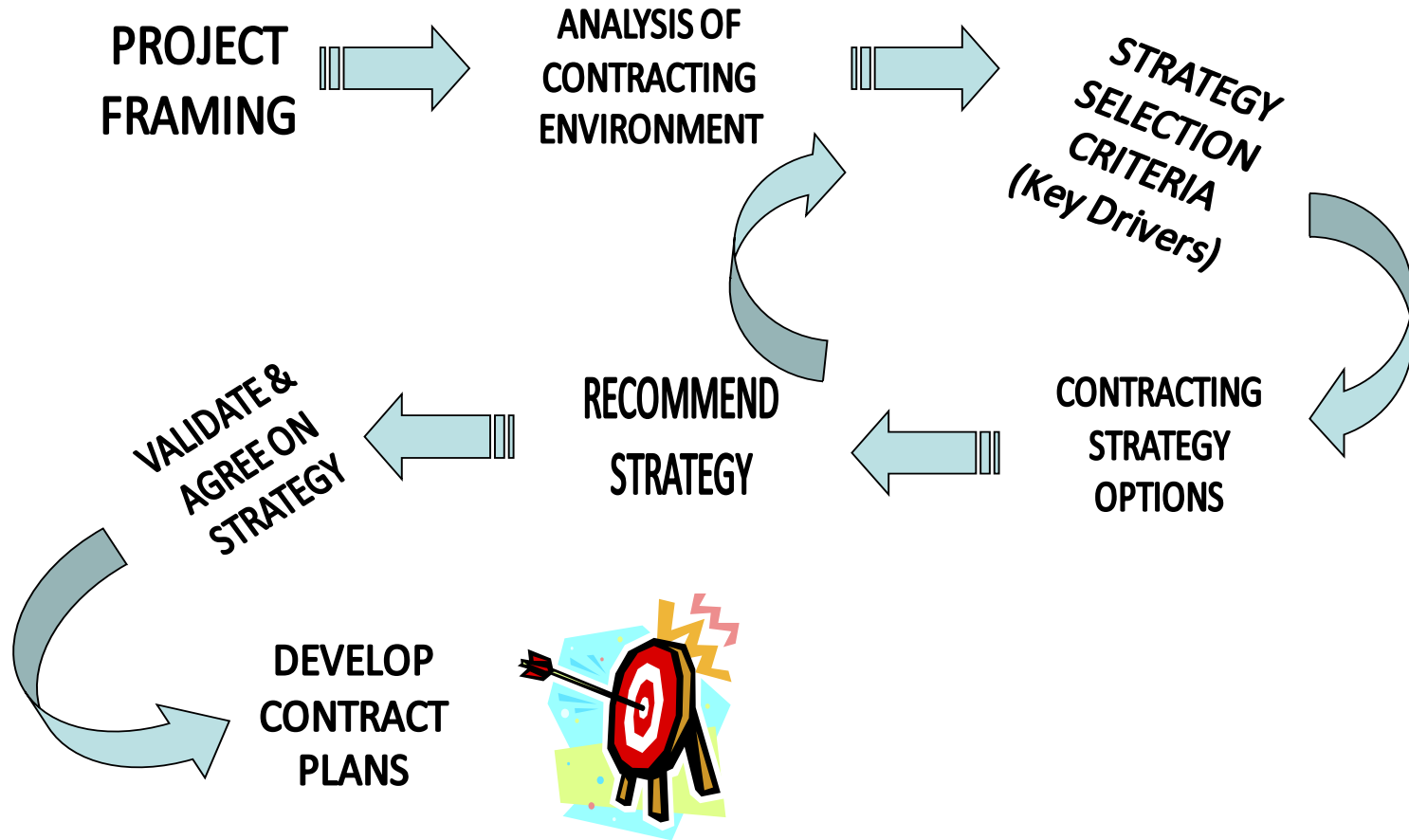
# Construction Management Riverbanks

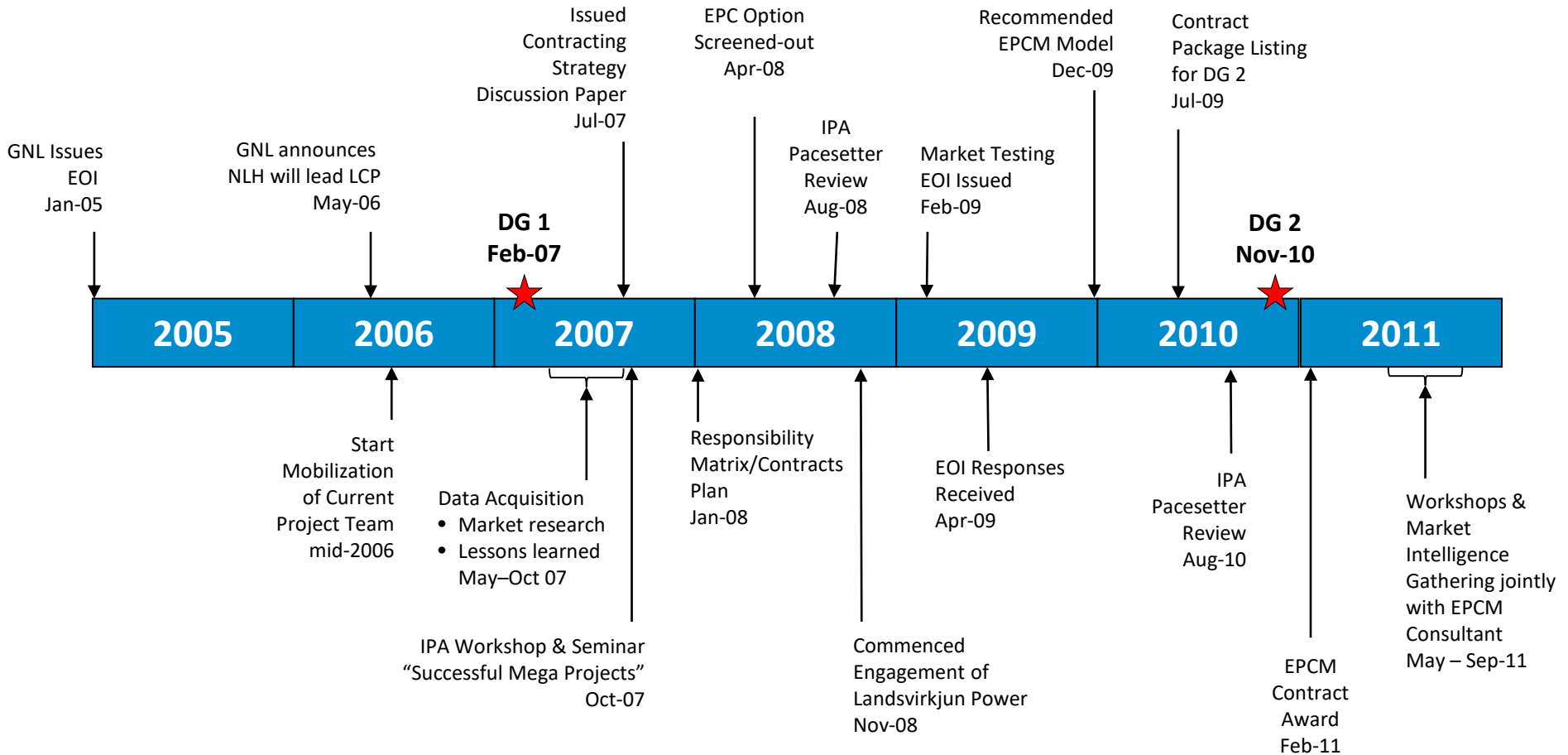


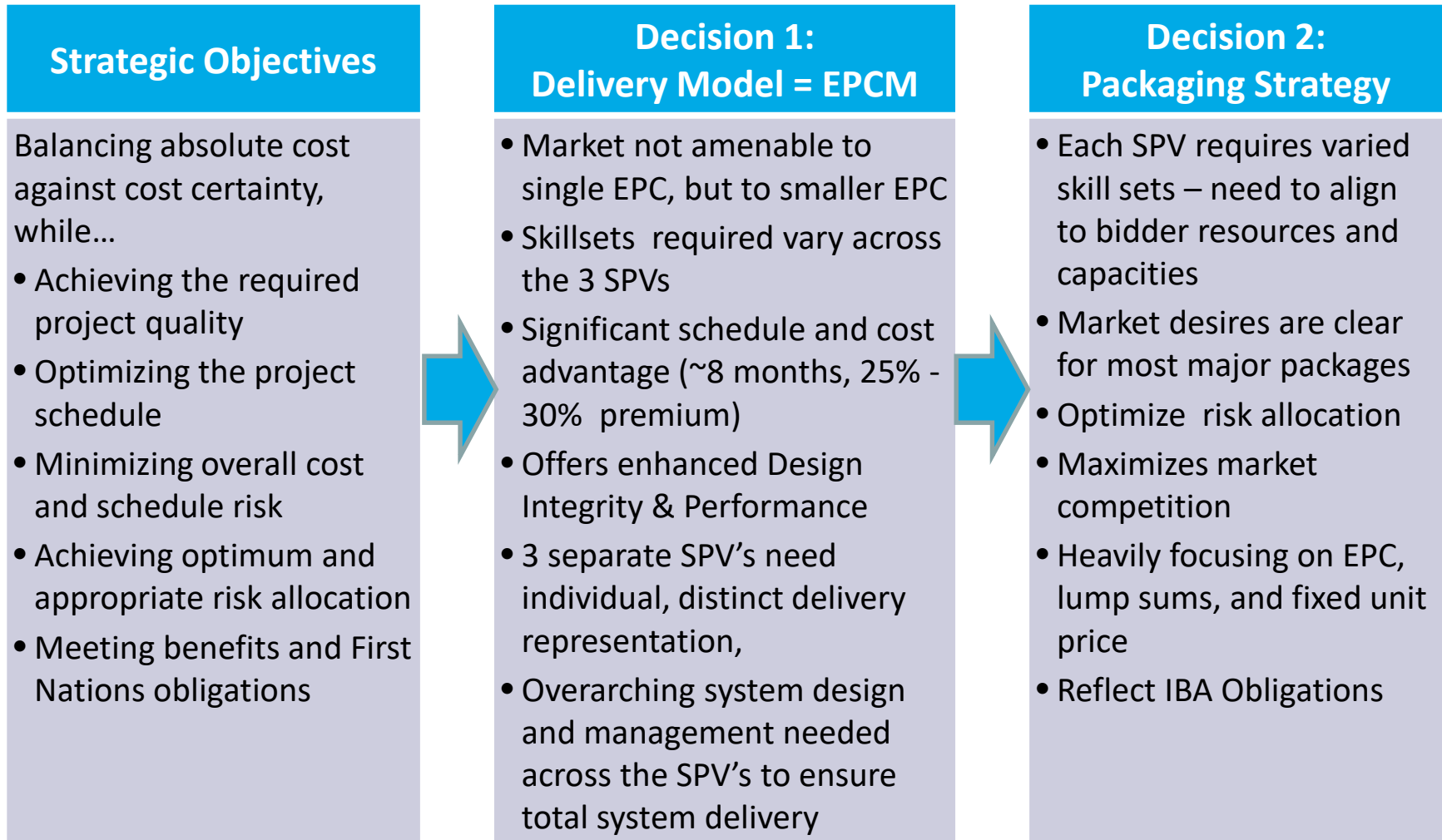
# Execution Strategy Development

- LCP Execution Strategy devised using a formulation process during Gateway Phases 1 and 2 (FEL 1 and FEL 2).
- Strategically shaped by the Province's decision it to lead the development of the LCP through Nalcor Energy.
- If warranted, strategy adjustments can occur, with change being addressed through MOC Process.

# Execution Strategy Formulation Process



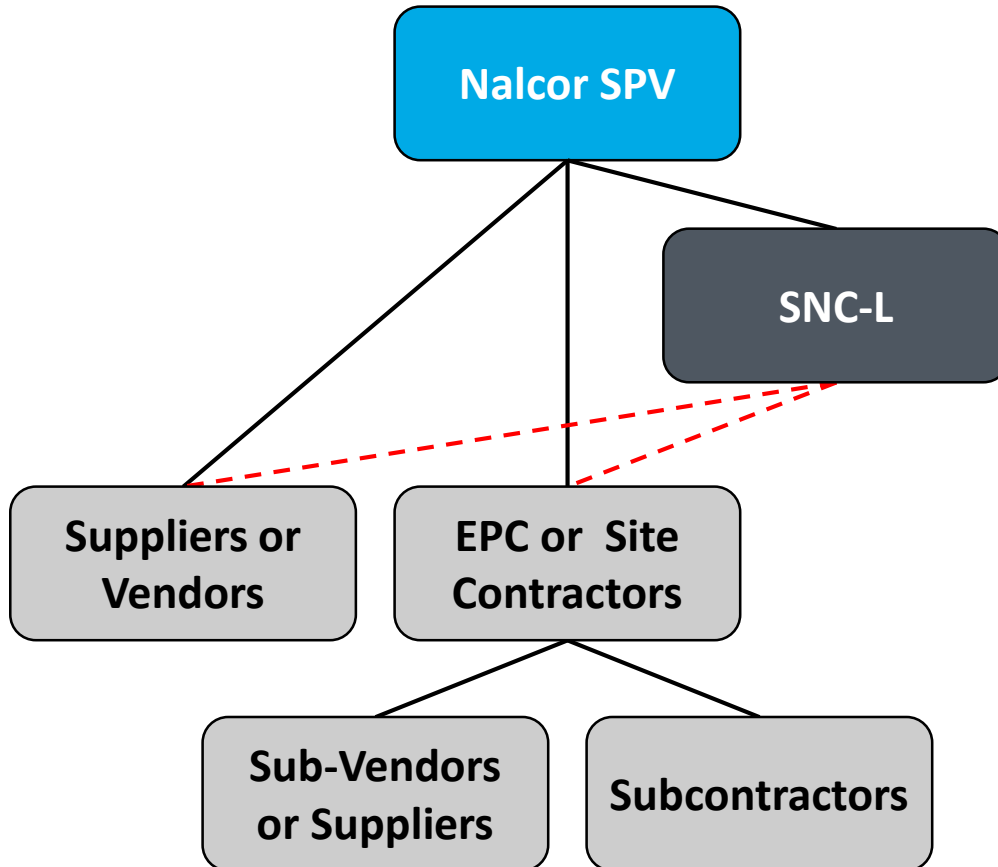




# Nalcor as Integrator

- Nalcor and its EPCM Contractor will manage contract interfaces, resulting from the optimal balance between cost, execution risk and execution certainty. This will be accomplished through actions such as:
  - Aligned interests of the Nalcor/SNC-Lavalin team;
  - Ensuring appropriately sized and skilled owner/EPCM team;
  - Keeping interfaces to single points where practical; and
  - Implementing a rigorous project wide interface management process.

# Typical SPV Delivery Structure



— EPCM Agent Role

SNC-L performs detailed engineering, procurement and construction management services.

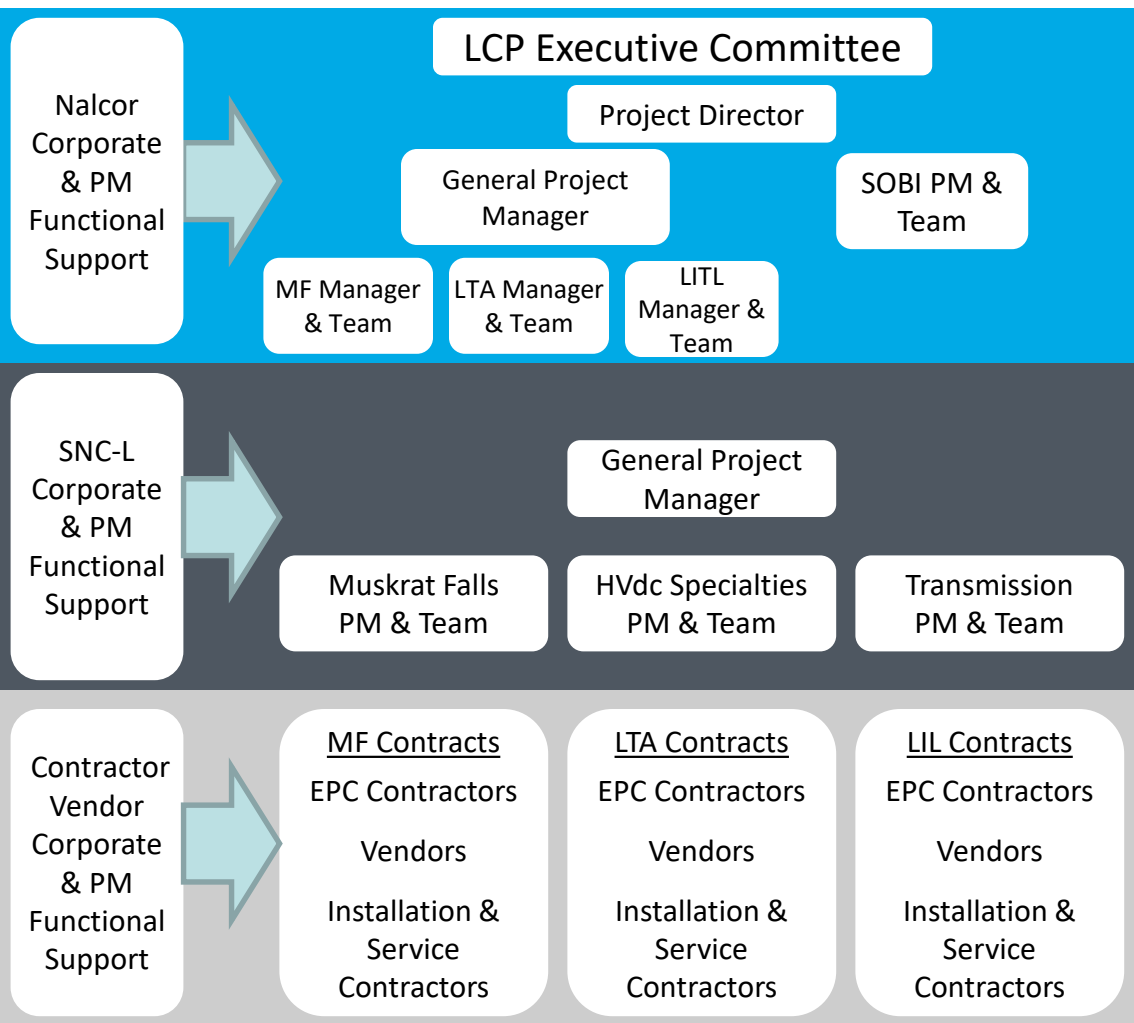
Agreements are between Nalcor SPV and Contractors

The EPCM Consultant acts as representative for the Nalcor SPV in both procurement and construction management activities.

**Note:** The above is not applicable for SOBI Crossing, where Nalcor provides all procurement and construction management for this specialized scope.



# Organizational Structure



## Nalcor provides:

- + Strong Owner direction, guidance & leadership
- + Overall integration
- + 35 years operational experience
- + 30 years front end loading, PM best practices
- + Responsibility for finance, aboriginal, regulatory, insurance, environmental approvals, Shareholder, marine works, governance and decision making

## SNC-L provides:

- + World class track record of hydro-electric and transmission project execution
- + Extensive corporate resources to call on
- + Strong corporate support for Projects
- + Commitment to Project Excellence

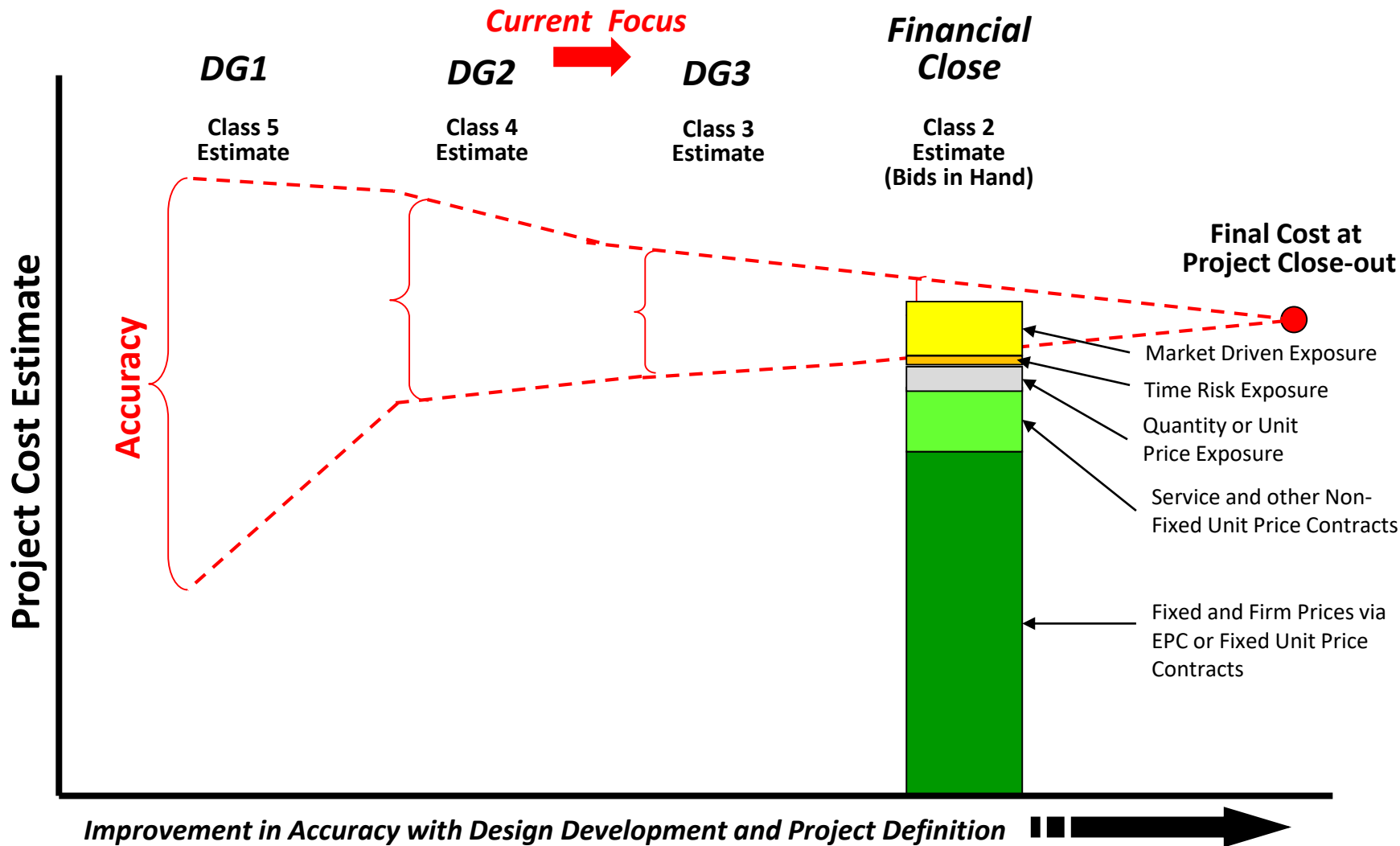
## Contractors & Vendors provide:

- + Only top quality, reputable Tier 1's will be selected to bid
- + Only those with sound financial basis will be chosen
- + Compliance with contract format, terms and conditions

# Contract Packages

SPV	Major Construction Contracts by Type			Major Procurement Packages	Other Packages	Total
	Lump Sum	Combination Lump Sum & Unit Price	Unit Price			
Muskrat Falls Generation	6	7	4	3	45	<b>65</b>
Labrador Transmission Assets	n/a	3 (1,2)	n/a	9 (1,2)	3	<b>15</b>
Labrador – Island Transmission Link	3 (1,2)	8(1,2)	n/a	9 (1,2)	8	<b>28</b>
Common (3)	n/a	1	n/a	n/a	11	<b>12</b>
<b>Total</b>	<b>9</b>	<b>20</b>	<b>4</b>	<b>21</b>	<b>66</b>	<b>120</b>

# Contracting Strategy will enable Sound Cost Basis at Financial Close



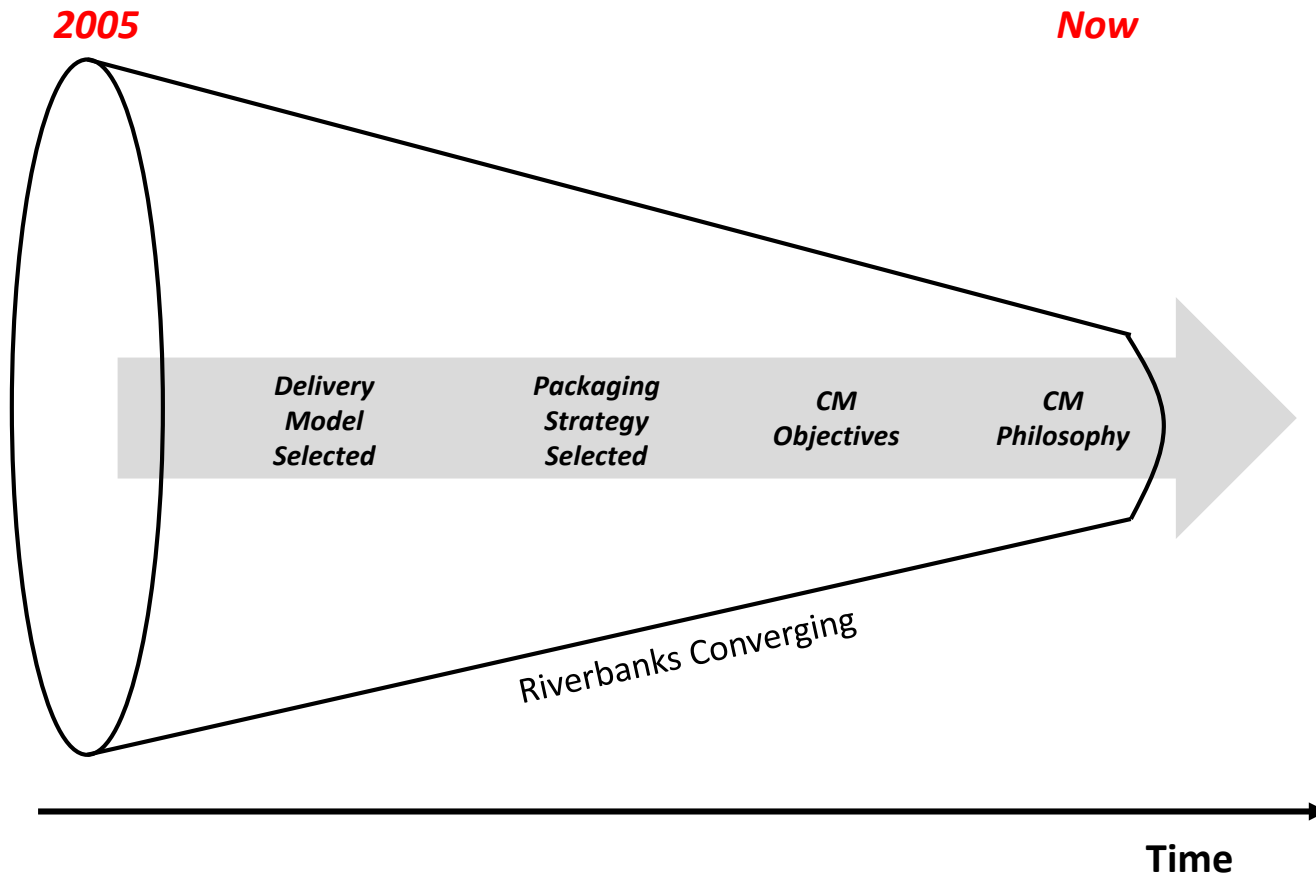
# Working within the Riverbanks



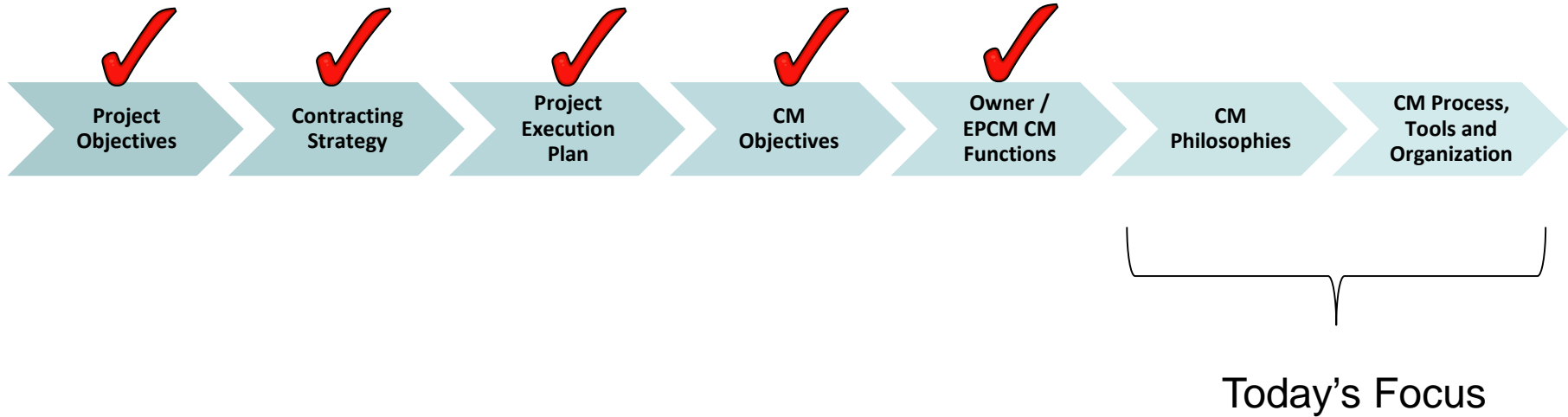
# Strategic Decisions Made

- Overall Project Delivery Approach
- Owner team with financial responsibility
- Application of Front End Loading
- Project execution using Decision Gate Process
- World Class EPCM Contractor – SNC-Lavalin Inc.
- We will engage top tier Contractors and Suppliers
- Contract Packages will be large and minimize interfaces
- CM will be lean and mean using large, experienced Contractors using their own processes/systems

# CM Plans contained within these Riverbanks



# Key Steps CM Plan Formulation Steps



# CM Objectives

- Complete all construction work:
  - Safely
  - In conformance with specifications
  - Within budget
  - On schedule and,
  - To provide an optimum level of protection against controllable risks



# Owner / EPCM CM Function

- Owner's Construction Management role must fulfill three (3) key primary functions:
  1. To ensure that work was carried out according to approved contracts, specifications, drawings and schedules, within authorized budgets and in compliance with safety and environmental standards.
  2. To manage the interface between various contract packages so as to ensure timely completion and avoid claims.
  3. To oversee the smooth operation of jobsites, and for Muskrat Falls includes the provision and operation of camp and site services.

# CM Philosophies

- CM Philosophies are the fundamental guiding principles that dictate how a construction management will be undertaken on the Project.
- Approaches to achieve CM objectives must be aligned with the CM philosophies established for the Project.
- Subject of our discussion today.

# Construction Management Philosophies



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# Decision Making and Communication



- A level of financial approval and decision making authority will be necessary at site offices (i.e. Muskrat Falls) in order to facilitate the efficient administration the Owner's contractual responsibilities.
- All contract changes (including field work instructions) will require approval of the Owner.
- Timely decision making is imperative to avoid delay claims from the contractors.

# Decision Making and Communication

(Continued)

# Decision Making and Communication

(Continued)



# Decision Making and Communication

(Continued)

# Constructability



# Constructability (Continued)

# Constructability (Continued)

# Constructability (Continued)

# Contracting and Procurement



# Contracting & Procurement

# Contracting & Procurement (Continued)



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# Free-Issue of Goods and Services to Contractors



# Free-Issue of Goods and Services

# Free-Issue of Goods and Services (Continued)

# Site Administration and Control



# Site Administration and Control

# Site Administration and Control



# Contractor Oversight and Coordination



# Contractor Oversight

# Contractor Oversight (Continued)

# Contractor Oversight (Continued)

# Contractor Oversight (Continued)

- Optimize size of site organizations in consideration of Home Office support, experience of contractors, value achieved and common industry practice.
- CM site organization to expand with requirements and will take advantage of synergies so as to keep site team size to a minimum level.

# Contractor Oversight (Continued)

# On-Site Quality Control



# On-Site Quality Control



# On-Site Quality Control (Continued)

- Establish witness and hold points for each contractor's Inspection and Test Plan
- Audit contractor's quality control activities and documentation
- Verify status of quality files and as-builts before approval of monthly progress billings

# On-Site Quality Control (Continued)

- Examination of foundations and approval by the EPCM of the quality of foundations before any earthwork or concreting can be done.
- Approves all concrete pours before pour is undertaken by contractor.
- Quality checks of concrete at the mixing plant.
- Request and approves of remedial work.

# On-Site Quality Control (Continued)

- Pre-testing concrete materials before they arrival at the batch plant.

# Safety and Security



# On-Site Safety and Security

# On-Site Safety and Security (Continued)

# On-Site Safety and Security (Continued)

# On-Site Safety and Security (Continued)



# On-Site Safety and Security (Continued)

# Environmental Management



# Environmental Management

# Environmental Management (Continued)

# Change Management



# Change Management

# Change Management

# Industrial Relations





# Industrial Relations

# Industrial Relations (Continued)

# Productivity Management



# Productivity Management

1. Front-End Loading / Workface Planning – Site Layout, job preparation, competency
2. Concept of Constructability and Productivity drives design and execution approach
3. Union alignment and labour relations
4. Worker Motivation, Morale & Retention
5. Establishing a Safety Culture
6. Effective Supervision – Quantity and Quality
7. Avoid Silos – Manage Interfaces

# Productivity Management (Continued)

# Post Design Technical Support & Field Engineering



# Post Design Technical Support / Field Engineering

# Post Design Technical Support / Field Engineering (Continued)



# Application of Technology



# Application of Technology on Site

# Application of Technology on Site (Continued)