



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

Essence of Industrial Involvement, with introduction to Major Element 1: National Survey on capacities of local industries

Satoru Yasuraoka

Nuclear Infrastructure Development Section

February 2020

IAEA Milestones Approach: Infrastructure Issues



“Industrial Involvement” is one of the 19 infrastructure issues in Milestones Approach.

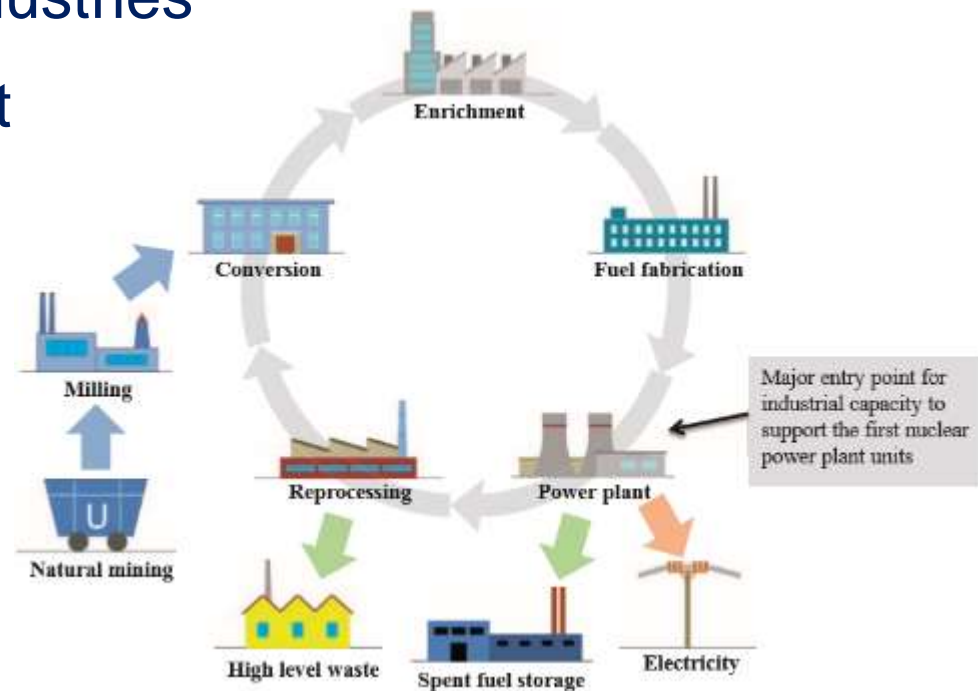
NPP Project and Industrial Involvement

□ Expectation to NPP Project

- Stable energy source
- Development of local industries
- Technology development

□ NPP Project requires:

- Advanced technology
- High quality standards
- Special material
- Long-term schedules
- Strict safety culture applied to supply chain overall



Benefits of Localization

❑ For **EPC Contractor**

- Secure supply chain
- Efficient employment
- Effective logistics

❑ For **Government**

- Job creation
- Support to high skilled jobs
- Impact on GDP growth

❑ For **Local Industries**

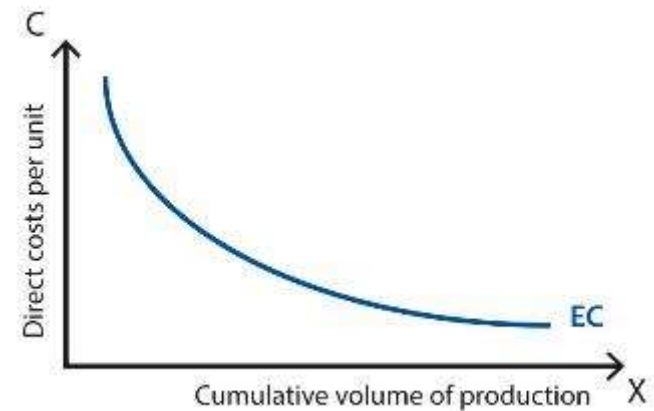
- Technology transfer
- Strengthen Partnerships
- Access to world market for nuclear/non-nuclear areas



Challenges of Localization

❑ In terms of **Cost**

- Require additional local investment (e.g. machine tools) as well as capacity building
- Need to wait “Experience Curve Effect” in localization
- Confront risks of delivery delay (i.e. 1-day delay in construction often causes M-dollars per day)

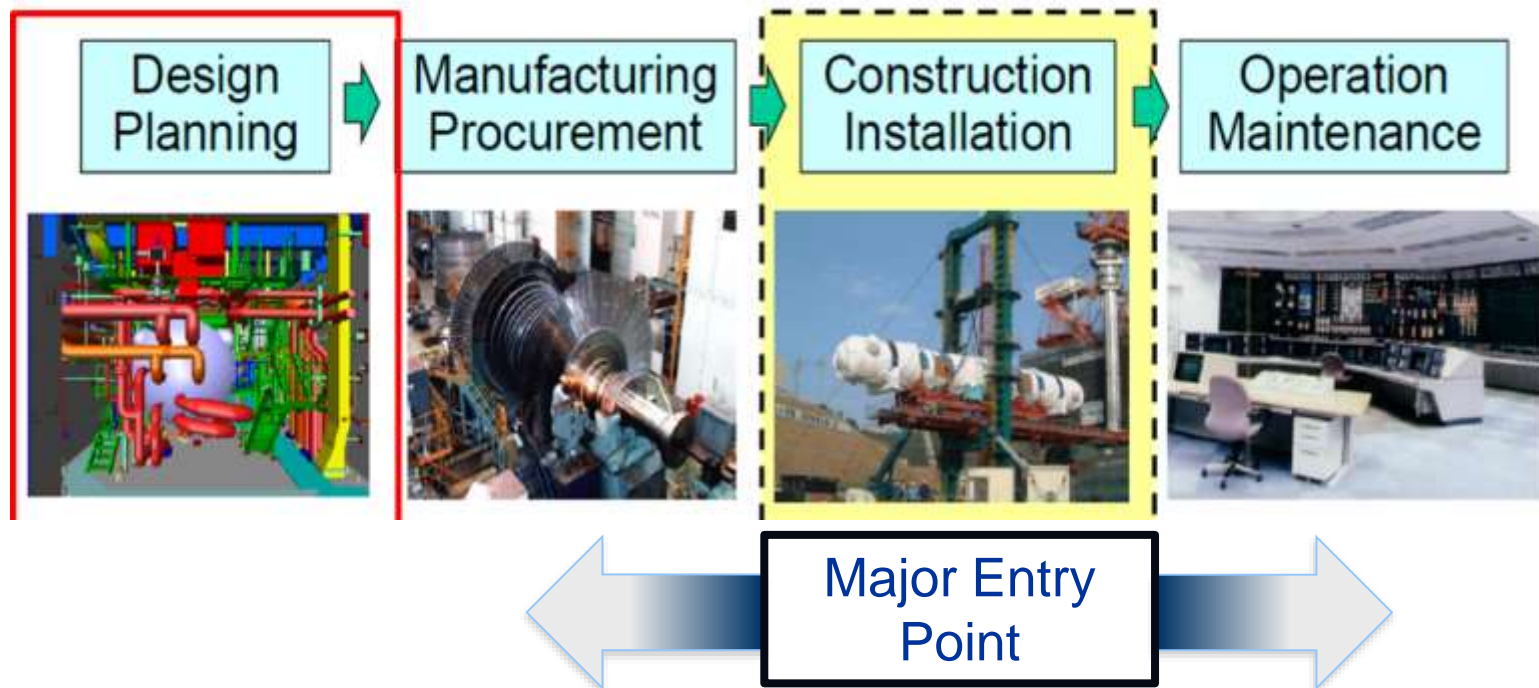


❑ In terms of **Quality**

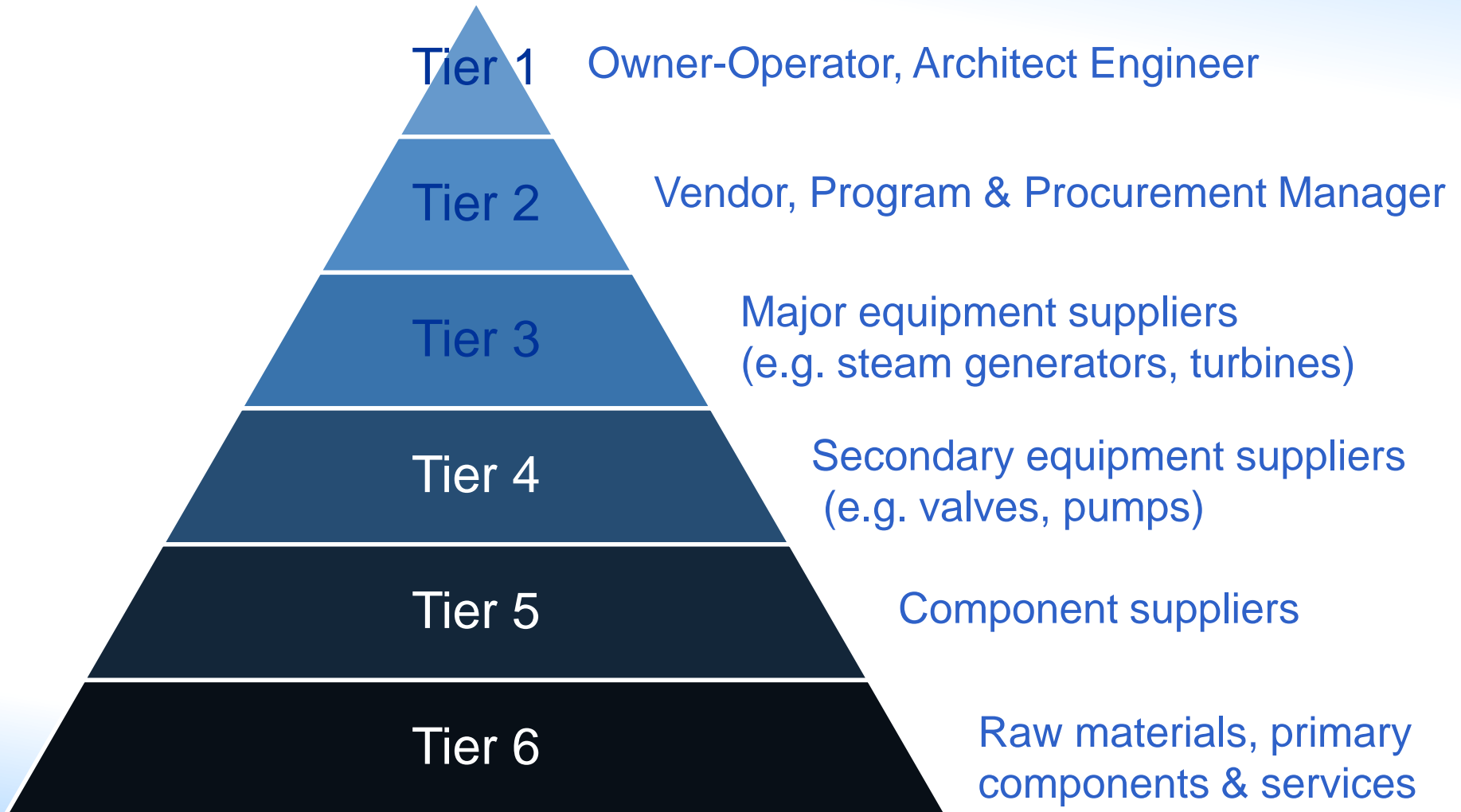
- Require strict specification including Quality Assurance & Quality Control management skills



Industrial Involvement Needs Long-term Strategy



Graduation of Suppliers in new NPP



Typical Activities for embarking countries



Phase 1 (Pre-project Activities)

Phase 2 (Project Development)

Planning, Decisions & Approval of **Project Development**

Execution of **Project Development**

Planning, Decisions & Approval of **Contract & Agreements**



Phase 3 (Manufacturing & Construction)

Execution of **Contract & Agreement**

- 1) Key NPP Supplier Negotiation
- 2) Power Generation & Supply Agreement Negotiation
- 3) Nuclear Installation License Application



Execution of **Early Preparation Activities**

Planning of **Manufacturing and Construction**

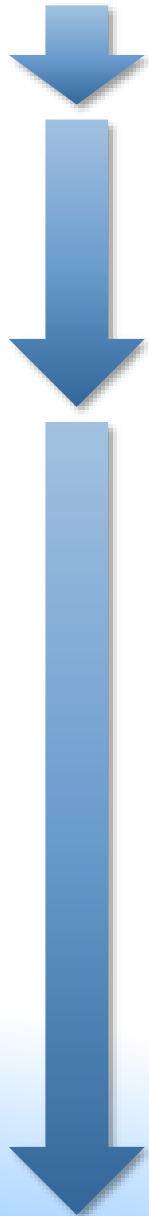
Decisions & Approval of **Final Investment**

Execution of **Manufacturing and Construction**

(incl. site integration designs, transportation, installation)

Planning of **Commissioning & Operations**

Decisions & Approval of **Commissioning & Operations**



Industrial involvement : Phase 1 (Consider to Decide)

❑ NEPIO (Nuclear Energy Project Implementation Organization) to **Assess**;



- Local industrial capabilities
- Interest of business / industrial leaders in participating in the NPP project considering the special requirements
- Investment for intended upgrading of industrial facilities

❑ NEPIO to **Develop**;

- Short term and long term policies on the area/level of local participation that is practical and desired

❑ NEPIO to **Initiate** dialogue with potential vendor(s)



Industrial involvement : Phase 2 (Prepare to Contract)

❑ NEPIO to **Consider**;

- Which local suppliers can reliably supply commodities, components and/or services.
- Which upgrades in skills & capabilities are realistic in the time-frame required to support NPP construction.



❑ NEPIO to **Determine**;

- Bid specification which should include information about domestic industry capabilities & requirements related to technology transfer.

❑ NEPIO to **Implement** policy regarding capacity building, incentives, etc.

Industrial involvement : Phase 3 (Construct to Commission)

❑ NEPIO to **Implement**;

- Industrial Involvement Policy continuously



❑ Owner/Operator to **Conduct**;

- Reassessment of the supply sources to support operation

❑ Local manufacturers to **Obtain**

- Necessary qualification for not only construction but also operational support by Owner/Operator



Examples of **Suggestions/Recommendations** from INIR Missions (1)



- ❑ Set up a target for local content for NPP construction utilizing the result of the survey of domestic industrial capability.
- ❑ National Programme for local industrial involvement should be developed based on the assessment of local industries' capability.
- ❑ Communications between possible NPP vendors and the relevant Ministries, Electric Utility and possible national suppliers should be adequately coordinated.

Examples of **Suggestions/Recommendations** from INIR Missions (2)



- ❑ (NEPIO) with the support of (Ministry of Economy) and other relevant agencies should develop a policy on industrial involvement for the Gov approval.
- ❑ The list of potential local suppliers for goods and services for the first NPP which was prepared XX years ago should be updated by (NEPIO) and included in the specification for contracting.
- ❑ It is suggested to include a determination of the needs for future investment in the potential local suppliers for goods and services for the first NPP during the detailed survey to be performed by (NEPIO) together with selected NPP vendor.

Elements for successful Industrial involvement



Receiving countries need to develop/prepare/conduct;

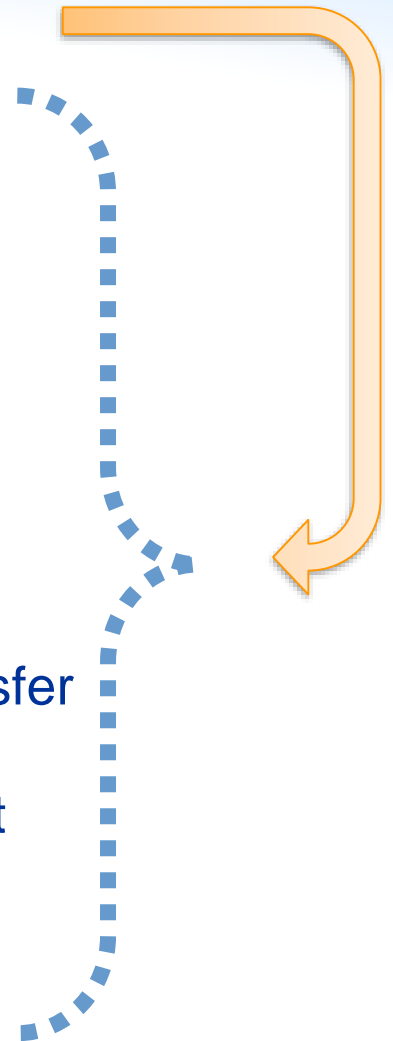
- Capacity surveys of local industries**
- Policies for developing industrial capacity
- Industrial standards & quality assurance mechanisms
- Capacity building activities such as:
 - ✓ National R&D programme
 - ✓ Partnership w/ competent players for technology transfer
 - ✓ Long-term and low-interest loan for capital investment
- National/Local investment for the above activities
- Negotiation with vendor and/or EPC contractor

Summary (so far)

- ❑ NPP can be a trigger of developing national industries through self-efforts and technology transfer.
- ❑ NPP requires high-level technology & effective industrial relation, so it is advisable to understand major elements for successful Industrial Involvement to prepare strategically.
- ❑ NEPIO plays an important role to develop policy regarding industrial involvement, conduct capacity survey, and facilitate capacity building of local industries.
- ❑ IAEA offers continuous services like Technical Meeting, National Workshop, Training Course, NE-Series Document to help Member States in terms of Industrial Involvement.
You can/should utilize the resources!

Capacity Survey impacts on other elements!

- ❑ **Capacity surveys of local industries**
- ❑ Policies for developing industrial capacity
- ❑ Industrial standards & quality assurance mechanisms
- ❑ Capacity building activities such as:
 - ✓ National R&D programme
 - ✓ Partnership w/ competent players for technology transfer
 - ✓ Long-term and low-interest loan for capital investment
- ❑ National/Local investment for the above activities
- ❑ Negotiation with vendor and/or EPC contractor





Indonesia has conducted national surveys properly..

Evaluation Result of National Survey



13 companies that were identified capable with various level of capability

Evaluation was based on its financial status, employee, equipment and tools, major experience records, quality assurance system, and finally conclusion about that company.

Most of company should improve their Human Resources, Financing, revised their QA system to include more specific requirements, equipments

Performing Survey



Number of companies were studied

Companies	Selected for General Criteria	Selected for specific criteria
Civil construction company	9	3
Mechanical equipment manufacturing	19	8
Electrical equipment manufacturing company	5	
Architectural companies	6	2

Evaluation Result of National Survey



From the investment point of view, the result of the study are:

The localization ratio (national participation / local content) for the first two NPP (step-1) in Indonesia is about 20%.

The first step is referred as technology accumulation for NPP localization with turnkey approach.

For step-2, comprise of the next four NPPs construction, will reach about 50%, and so called as the joint implementation for NPP localization.

Concluding Remark



National survey is done to determine level of national industrial participation to nuclear power program

The survey result can be used to setup program for industrial involvement, to preserve the high quality and safety of the reactor and to reduce investment.

In order to preserve the high quality and safety the use of Standard and Quality Assurance must be prioritized.

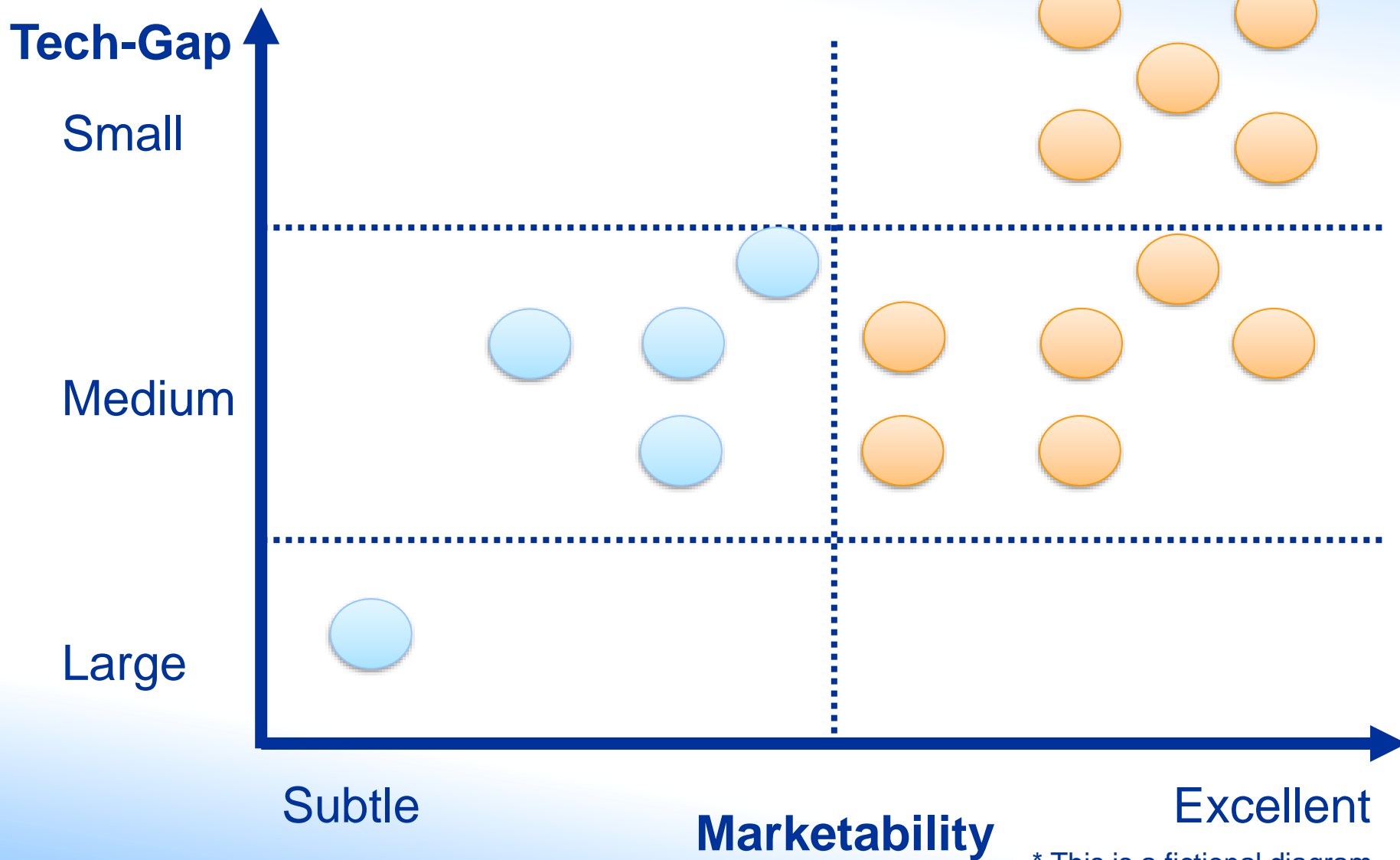
Negotiation must be performed in order to check the fulfilling of quality and safety and to reduce investment.

Key points for successful capacity survey



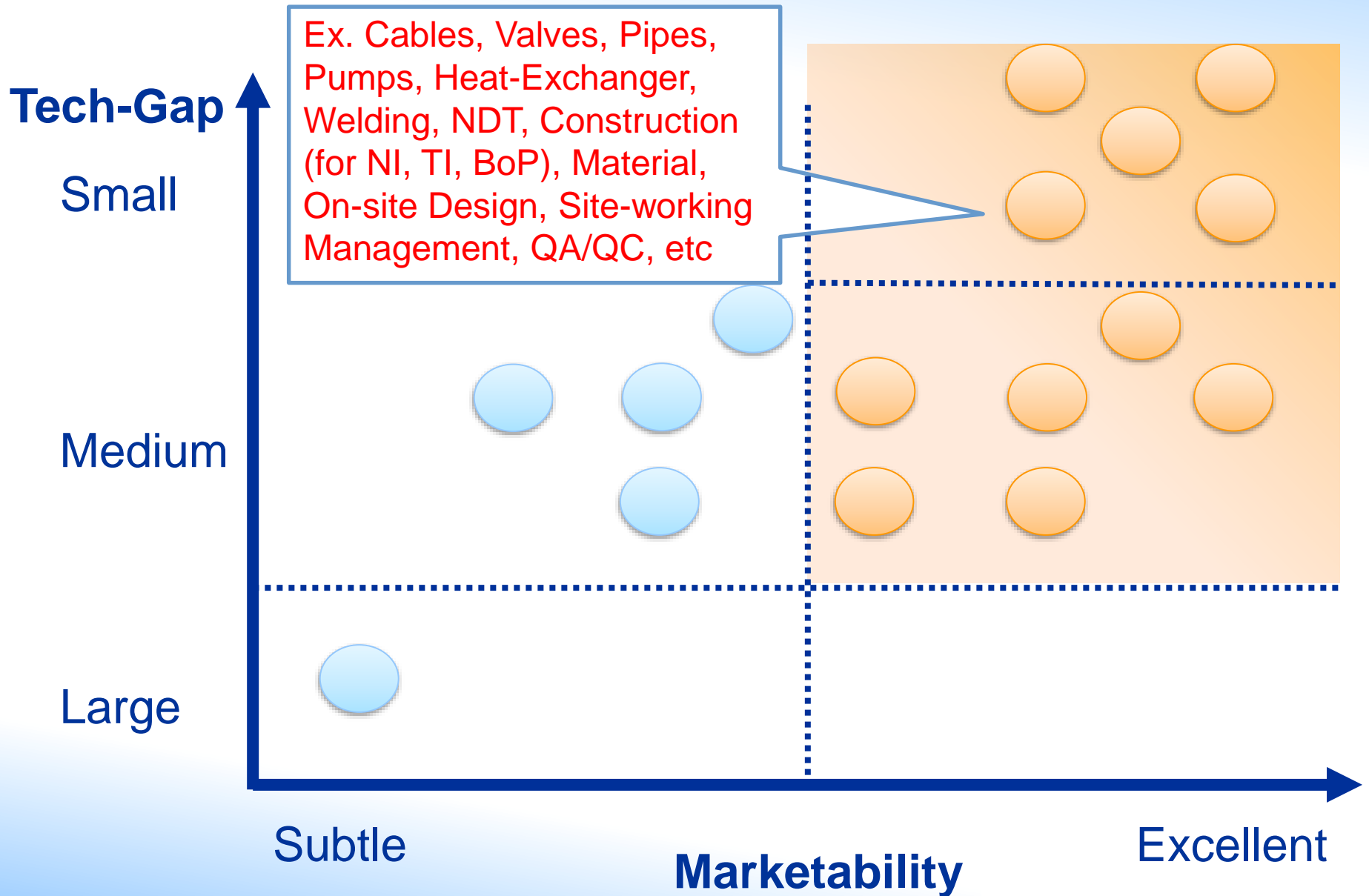
- Objective: Analyze the local participation possibilities.
- It can be involved in NEPIO, relevant ministries, industrial organizations, consultants, potential vendors & EPCs, etc.
- It is not “one-shot”, but multiple as industrial development.
- It needs methodology (e.g. breakdown of components, list up relevant industrial firms, define required services).
- It needs evaluation axes (e.g. technology gap, marketability).
- It needs criteria (e.g. language capability, ISO9001 holder, financial stability, manufacturing products in relevant fields).

Example of “Mapping”



* This is a fictional diagram.

Example of “Mapping” (2)

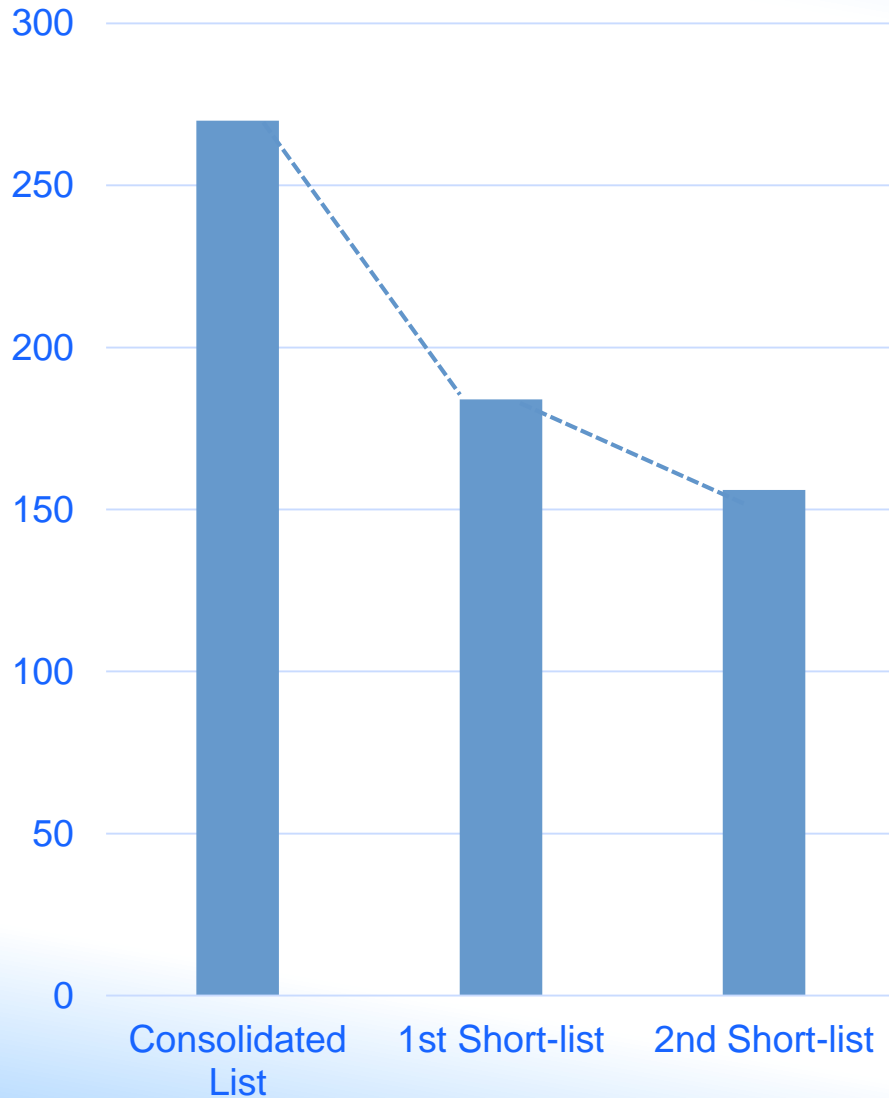


Example of “Short-list”

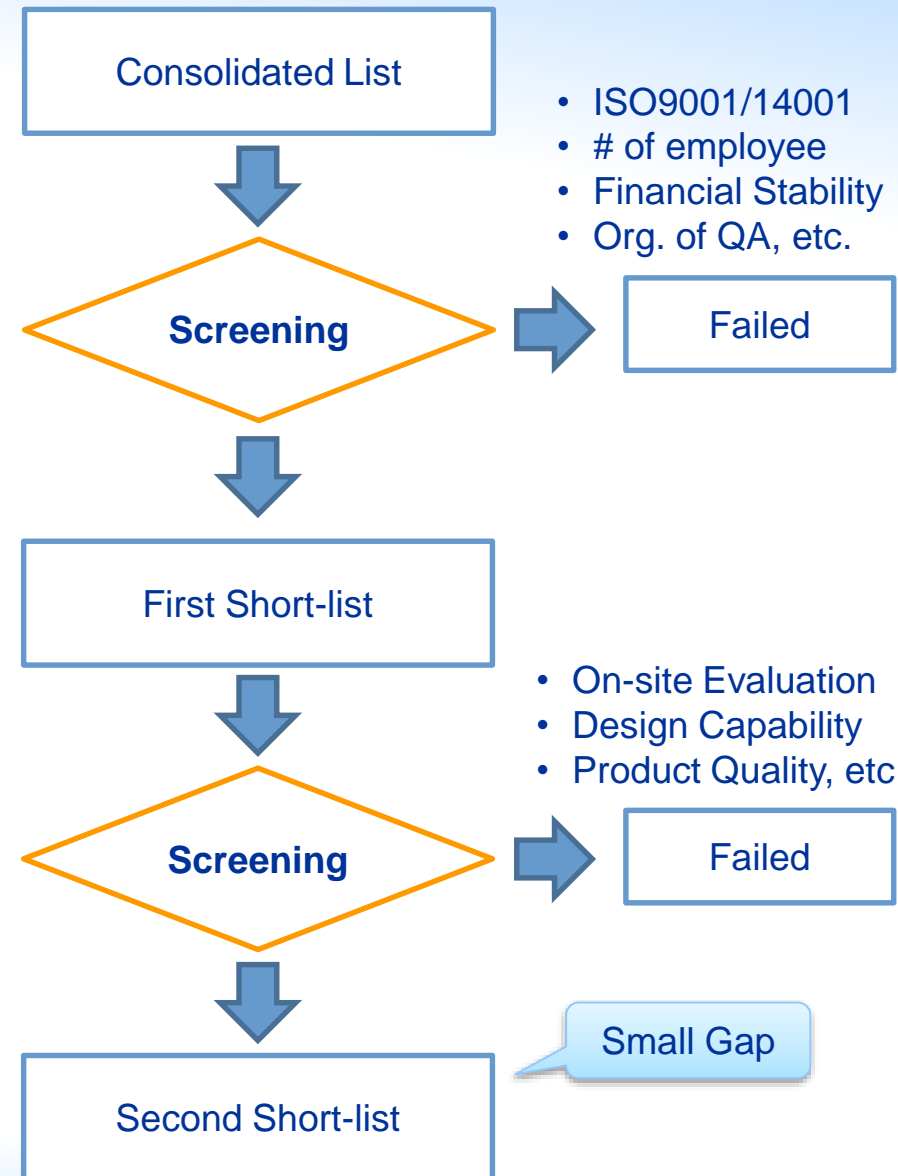
#	Vendor Name	Product	Remarks
1	AGR Manufacturing	Tank	SUS Tank Supplier
2	Tolstoy & Chekov Co.	Tank	
3	BRS Crane Ltd.	Crane	Member of XXX group
4	Satoru Piping Industries	Pipe	Steel Pipe only
5	NDT Empowerment Co.	Non-Destructive Testing	
6	Tek Pak Myong Industries	Cable Tray	Member of YYY group
7	KMI Metal Engineering Co.	Crane	
8	Super Piping Power Co.	Pipe	ASME NPT Holder
9	Art Flex NP Co.	Valve	
10	Tank Vessels & Trade. Ltd.	Tank	Partnership with ZZZ
11	Acuros Materials & Eng. Co.	Gear, Heat Exchanger	
12	Yasuraoka Electrics Ltd.	Valve	Supplier of XYZ NPP
13	Zakham Hyper-Pumping Engineering	Pump System	Partnership with ZZZ
14	Meg. SIM Engineering & Service Co.	Insulation	
15	FP Management Co.	Fire Protection	Member of XXX group

* This is a fictional list. All of vendors do not exist.

Example of “Short-list” in Capacity Survey



* This is a fictional chart.



Summary (capacity survey)

- ❑ Capacity Survey is critical: it impacts on quality of overall industrial involvement policies.
- ❑ The main objective of capacity survey is to analyse the local participation possibilities, and to grasp “tech-gap”.
- ❑ The survey process is not “one-shot”, but multiple as industrial development. It’s a continuous activity.
- ❑ The survey cannot be done by a single player — it can be involved in NEPIO, relevant ministries in the government, industrial organizations, potential vendors & EPCs, etc.
- ❑ NPP is a huge project: so the survey may need breakdown analysis, evaluation axes, criteria for screening short-list.

Terima kasih!

