



สัญญาพลังงานและการบริหารสัญญาพลังงาน

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About me



Chanchai Kitprotpisuth

- **Qualifications :**

Bachelor of engineering. (Mechanical), King Mongkut's University of Technology Thonburi, Thailand

Master of engineering. (Energy Management), King Mongkut's University of Technology Thonburi, Thailand

- **Career Progression**

- **2014-Present :**

Energy Optimization (Thailand) Co.,Ltd.

Managing Director

- **1999-2014 :**

Energy Conservation Systems (Thailand) Co.,Ltd.

Marketing Director

- **1993-1999 :**

EEC-Energetics Co.,Ltd.

Energy Engineer

ESCO Energy Performance Contract (ESCO EPC) and ESCO EPC Management

EPC Private Contract – Overall Flowchart

Project Initiation

- Owner & ESCO
- Various type of EPCs
- Preliminary Analysis

Project Development

- Investment Grade Audit
- Project Procurement

Project Implementation

- Detail Engineering
 - Installation
- Commissioning

Project Operation

- Commercial Operation
- Operation and Maintenance



Energy Performance Contract

An EPC is a contract which is used between energy services businesses and their customers to implement energy efficiency opportunities, and which has some performance guarantees.

Services include design, engineering, construction, installation, commissioning, and measurement and verification (M&V) of the resulting cost savings.

Optional services may also include providing and/or arranging financing, facility operations and maintenance (O&M), and training.

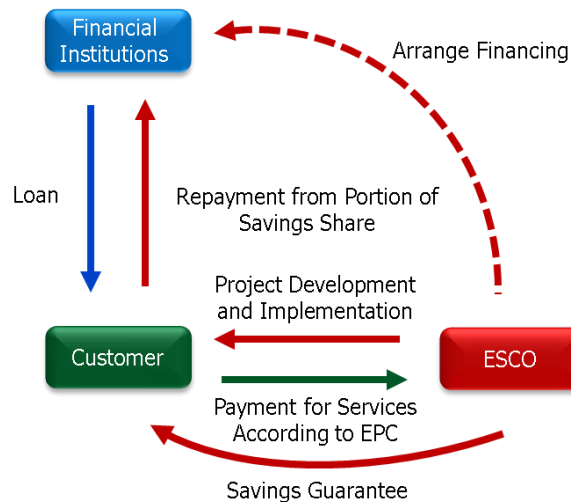


EPC Private Contract

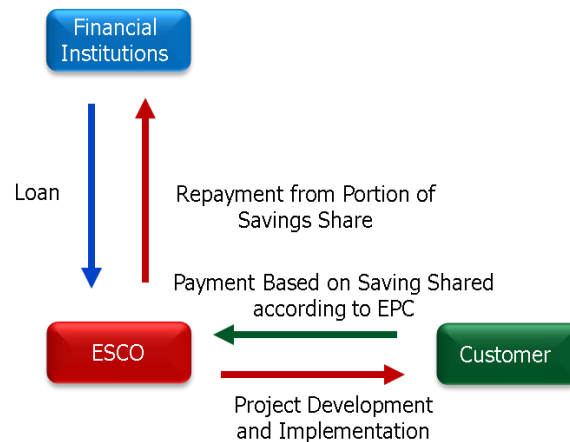
Energy Performance Contract

RECAP

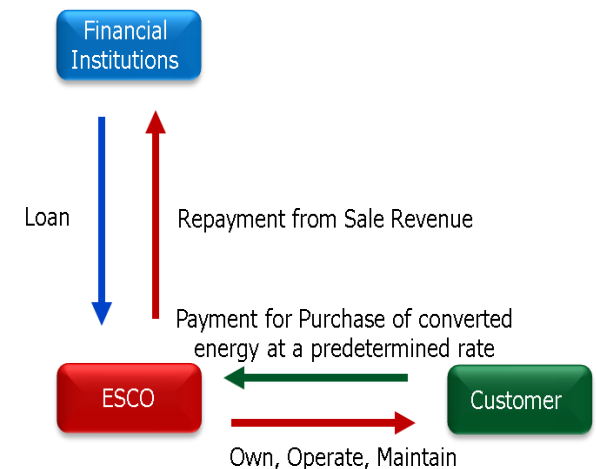
Guaranteed Saving Model



Shared Saving Model



Guaranteed Rebate (CHAUFFAGE)



EPC Private Contract

What is Main Business Issues in EPC Contract?

- **Project definition**
 - **Project financing**
 - **ECMs - Implementation and execution planning**
 - **Excess savings**
 - **M&V options - measured or stipulated?**
-
- **Energy savings M&V**
 - **Facility modifications (Adjustments)**
 - **O&M responsibilities**
 - **Operating conditions**
 - **Other protective standard contractual terms**

EPC Private Contract

Structure of ECP Contract

IDENTIFICATION

AGREEMENT entered into in the city of [xxx] on the day of between

The Client (hereby referred to as the CUSTOMER)

[Note: To personalize this contract, the writer can make a global search and replace with the word CUSTOMER in capital letters] and

[ESCO name], [address] represented by [name of ESCO representative], [position of ESCO representative] (hereby referred to as ESCO)

EPC Private Contract

Structure of ECP Contract	
	IDENTIFICATION
	RECITALS

Intentions & Background & Scope

AND WHEREAS in [date xxx] was founded [ESCO name], a company wholly owned by [xxx] and registered with the Commercial Court in [City] for the management and funding of energy efficiency projects;

AND WHEREAS ESCO presents a [letter of intent/ cooperation agreement / implementation agreement] re: ["project name"] to the CUSTOMER and the CUSTOMER accepts the Letter of Intent [letter of intent/ cooperation agreement / implementation agreement] on ____;

AND WHEREAS in [dates], ESCO prepares an Investment grade audit incorporating the feasibility analysis in a selection of [buildings] adequate for the implementation of energy efficiency project;

AND WHEREAS the conclusions of this investment grade audit are contained in [one or more] reports prepared by ESCO, are dated,(hereinafter referred to as the Reports) and are approved by the CUSTOMER;

AND WHEREAS the financial plan for investment payback from energy savings signifies the calculation of monthly installments as well as the investment payback period (hereinafter referred to as the Financial Plan);



EPC Private Contract

Structure of ECP Contract	
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION

ESCO hereby declares its commitment to provide integrated services as per the provisions stated in Article 3 for the implementation of an energy efficiency project at the CUSTOMER's Facility and in the manner and within the scope and quality agreed upon, and the CUSTOMER agrees to pay the contract price as established in the final Financial Plan.



EPC Private Contract

Structure of ECP Contract	
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION
2	DEFINITION



Definition of the most important terms for common understanding

"Energy savings" refers to the savings in electricity costs resulting from reduced energy consumption and demand in the Facility over a period of time agreed upon by both Parties bound by the present Agreement.

"Energy efficiency measures" refers to the upgrade, modification and/or replacement of mechanical and/or electrical equipment and controls that have been analyzed in the investment grade audit (IGA) and have been approved by the CUSTOMER for implementation in the Project.

"Facility" refers to the [building(s), network(s) or structure(s)] of the CUSTOMER where the project is to be implemented. The list of these [building(s), network(s) or structure(s)] is provided in Appendix A. The singular form "Facility" is used herein, regardless of the number of sites included in the Project

EPC Private Contract

Structure of EPC Contract	
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED



List of activities and services by the ESCO

The CUSTOMER hereby retains the services of ESCO for the completion of the Project. These services shall include:

1. the preparation of drawings and specifications of the works forming the subject matter of the Project (hereafter referred to as the "Work"), as per the provisions stated in Article X.
2. Supervisory services for construction
3. Savings measurement and verification services
4. Financial services
5. Operation and maintenance services
6. Energy management services
7. Assignment of the Project Manager

EPC Private Contract

	Structure of ECP Contract
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED
4	WORK DESCRIPTION



Summary of the measurement, according to the proposals contained in the Investment Grade Audit (IGA) Report

1. The Work included in the Project shall consist of the modification of the systems that consume energy within the Facility, according to the proposals contained in the Investment Grade Audit Report (IGA). Said modifications are hereto summarized in Appendix B and are described in detail in Report(s) referenced in Appendix C.
2. The CUSTOMER hereby acknowledges that the modifications prescribed by ESCO shall be undertaken with the goal of saving energy and that as a result, these modifications will not necessarily contribute to the improvement of existing conditions of temperature, humidity and ventilation of the Facility. If the CUSTOMER wishes to correct certain existing conditions which cause discomfort within the Facility, a specific agreement must be concluded with ESCO prior to the preparation of the IGA which should then specifically mention such improvements and the comfort objectives.

EPC Private Contract



Structure of ECP Contract	
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED
4	WORK DESCRIPTION
5	COPERATION OBJECTIVE

The Parties bound by the present Agreement shall collaborate in implementing the Project so as to achieve the following objectives:

- upgrade the electrical and/or mechanical systems as applicable to improve their energy efficiency;
- reduce the costs of energy consumed by the Facility;
- promote the development and implementation of new technologies within the Facility
- that the collaboration hereby established be maintained until the investments in the Project be paid back from the achieved savings.

EPC Private Contract



Structure of EPC Contract	
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED
4	WORK DESCRIPTION
5	COPERATION OBJECTIVE
6	BASIC PRINCIPLES

The Parties hereby agree to base their relations, which are the subject of this Agreement, on the following principles:

- [Shared planning and preparation],
- that ESCO be responsible for the financing and implementation of energy efficiency improvements in the Facility as well as the monitoring of the operation and maintenance of the upgraded part of the Facility's systems;
- that the total cost of completion of the Project and financing charges will be paid back from the savings achieved through the implementation of targeted measures

EPC Private Contract



Structure of ECP Contract	
	IDENTIFICATION
	RECITALS
1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED
4	WORK DESCRIPTION
5	COPERATION OBJECTIVE
6	BASIC PRINCIPLES
7	PROJECT PHASES

The Project shall be implemented in three phases:

- Preparatory activities for the implementation of energy efficiency measures : Phase 1 shall encompass the following activities : [xxxx]
- Implementation of energy efficiency measures : Phase 1 shall encompass the following activities : [xxxx]
- Operation, maintenance and invoicing of energy savings until project reimbursement Phase 1 shall encompass the following activities : [xxxx]

EPC Private Contract



Structure of EPC Contract	
	IDENTIFICATION
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1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED
4	WORK DESCRIPTION
5	COPERATION OBJECTIVE
6	BASIC PRINCIPLES
7	PROJECT PHASES
8	COORDINATION

- Both Parties hereby agree that all issues of significance for the execution and delivery of this Agreement shall be settled by mutual agreement of their representatives.
- Both Parties hereby agree to appoint a team of experts to form a joint Expert Commission to prepare and implement the Project; these experts shall be duly authorized representatives from each Party and shall be responsible for all decisions. Each Party shall assign up to 3 experts to the Commission.

EPC Private Contract



Structure of ECP Contract	
	IDENTIFICATION
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1	SCOPE DECLARATION
2	DEFINITION
3	SERVICES RENDERED
4	WORK DESCRIPTION
5	COPERATION OBJECTIVE
6	BASIC PRINCIPLES
7	PROJECT PHASES
8	COORDINATION
9	PROJECT FINANCING

- ESCO agrees to provide financing for the entire Project and to complete the funding scheme.

EPC Private Contract



Structure of ECP Contract	
	IDENTIFICATION
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1	SCOPE DECLARATION
2	DEFINITION
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6	BASIC PRINCIPLES
7	PROJECT PHASES
8	COORDINATION
9	PROJECT FINANCING
10	SPECIFICATIONS

Drawings, Specifications and Estimates

- The drawings, specifications and estimates shall be prepared according to the forms customarily used by ESCO. The identification and folding of drawings and the compilation of the estimates shall be performed according to ESCO standards. In the event that the CUSTOMER has already established standardized estimates, ESCO agrees to make use of these estimates.
- All original drawings, estimates and documents prepared by ESCO engineers, agents and technical personnel shall remain the property of ESCO and shall not be used by the CUSTOMER without the express written consent of ESCO and providing for the payment to ESCO of additional fees and subject to mutual agreement, except for the completion of the Project and the operation and maintenance of the Work included therein.

EPC Private Contract

Structure of EPC Contract

11 PROCUREMENT AND WORK



ESCO may delegate the performance of the Work proposed in Article 4 to contractor(s) to suitably complete the requested Work at the best quality/price according to a ranking grid prepared in the Agreement with the CUSTOMER.

ESCO agrees to remunerate said contractor(s) according to the method prescribed in its service contract.

EPC Private Contract



Structure of ECP Contract	
11	PROCUREMENT AND WORK
12	PROJECT ACCEPTANCE

- The CUSTOMER and ESCO shall start the Project acceptance procedure upon the completion of all energy efficiency measure implementation.
- The CUSTOMER shall be authorized to engage experts on its part, at its sole discretion, to participate in the acceptance procedure, in order to establish whether the carried out improvements are in compliance with this Agreement. Each Party hereto shall bear the costs of acceptance relating to their respective representatives.
- The Commission shall prepare the Statement of Acceptance which shall contain the following specific data [XXX]
- Each Commission member shall sign the Statement of Acceptance. If one member refuses to sign said document, this fact shall be entered into the Statement along with the reasons for such a refusal. Each Party shall keep one copy of the Statement of Acceptance. The Statement shall then
- be considered accepted by both Parties.
- If more than one member of the Commission refuses to sign the Statement of Acceptance, this fact shall be entered into the Statement along with the reasons for such a refusal. Each Party shall keep one copy of the Statement of Acceptance. The Statement of Acceptance shall then be considered

EPC Private Contract

Structure of EPC Contract	
11	PROCUREMENT AND WORK
12	PROJECT ACCEPTANCE
13	FINAL ESTIMATIONS



Final Estimation of Total Costs of Project Implementation, Energy Savings and Financial Charges

- The total cost of implementation of the Project, as established in the preliminary Financial Plan model in Appendix D, shall be adjusted following acceptance of the Project or, if applicable, following the completion of additional work identified and agreed upon in the Project Acceptance Report.
- The final estimation of the total cost of implementation for the Project will be carried out in the presence of duly authorized representatives of both Parties, namely, the entire Expert Commission, Commission representatives or any other person nominated by each Party.

EPC Private Contract

	Structure of ECP Contract
11	PROCUREMENT AND WORK
12	PROJECT ACCEPTANCE
13	FINAL ESTIMATIONS
14	FINANCIAL PLAN



A preliminary Financial Plan for the Project prepared by ESCO and approved by the CUSTOMER is attached to this Agreement (Appendix D). The preliminary Financial Plan is based on the estimated total cost of Project implementation, estimated savings from the IGA, agreed loan financing schemes, VAT, investment payback period and due dates.

- The Financial Plan sets out monthly amounts in [local currency] to be paid by the CUSTOMER to ESCO equal to the estimated monthly savings;
- The sum of all monthly installments to be paid by the CUSTOMER shall equal the total cost of implementation of the Project and the financing charges;
- The preliminary Financial Plan included herein (Appendix D) shall be adjusted at the end of the energy efficiency measure implementation using the updated figures, as per Article 13. The adjusted figures and reimbursement term calculation shall become the final Financial Plan, shall be approved by both Parties and shall be added to this Agreement as Appendix E. Payment from the CUSTOMER shall then be based on this final Financial Plan

EPC Private Contract

Structure of ECP Contract	
11	PROCUREMENT AND WORK
12	PROJECT ACCEPTANCE
13	FINAL ESTIMATIONS
14	FINANCIAL PLAN
15	PAYMENT



Energy Savings Guarantee. ESCO has formulated and, subject to the adjustments provided in Appendix F, guarantees the annual level of energy and operations savings to be achieved as a result of the installation and operation of the equipment and provision of services provided as per this Agreement and in accordance with the savings calculation formula as determined in Appendix F (M&V Plan). The Energy Savings Guarantee is set forth in annual increments for the term of the Agreement, as specified in Appendix I (Energy Savings Guarantee) and has been structured by ESCO to sufficiently cover any and all annual payments required to be made by the CUSTOMER, as expressed in Appendix J (Compensation to ESCO).

ESCO Project Management at each project phase

ESCO Project Management at each project phase

Project Initiation

- Owner & ESCO
- Various type of EPCs
- Preliminary Analysis

Project Development

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- Project Procurement

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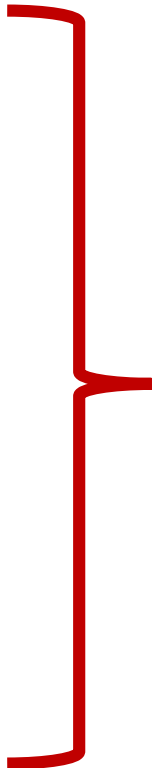
**ESCO
Project Delivery
Methodology**

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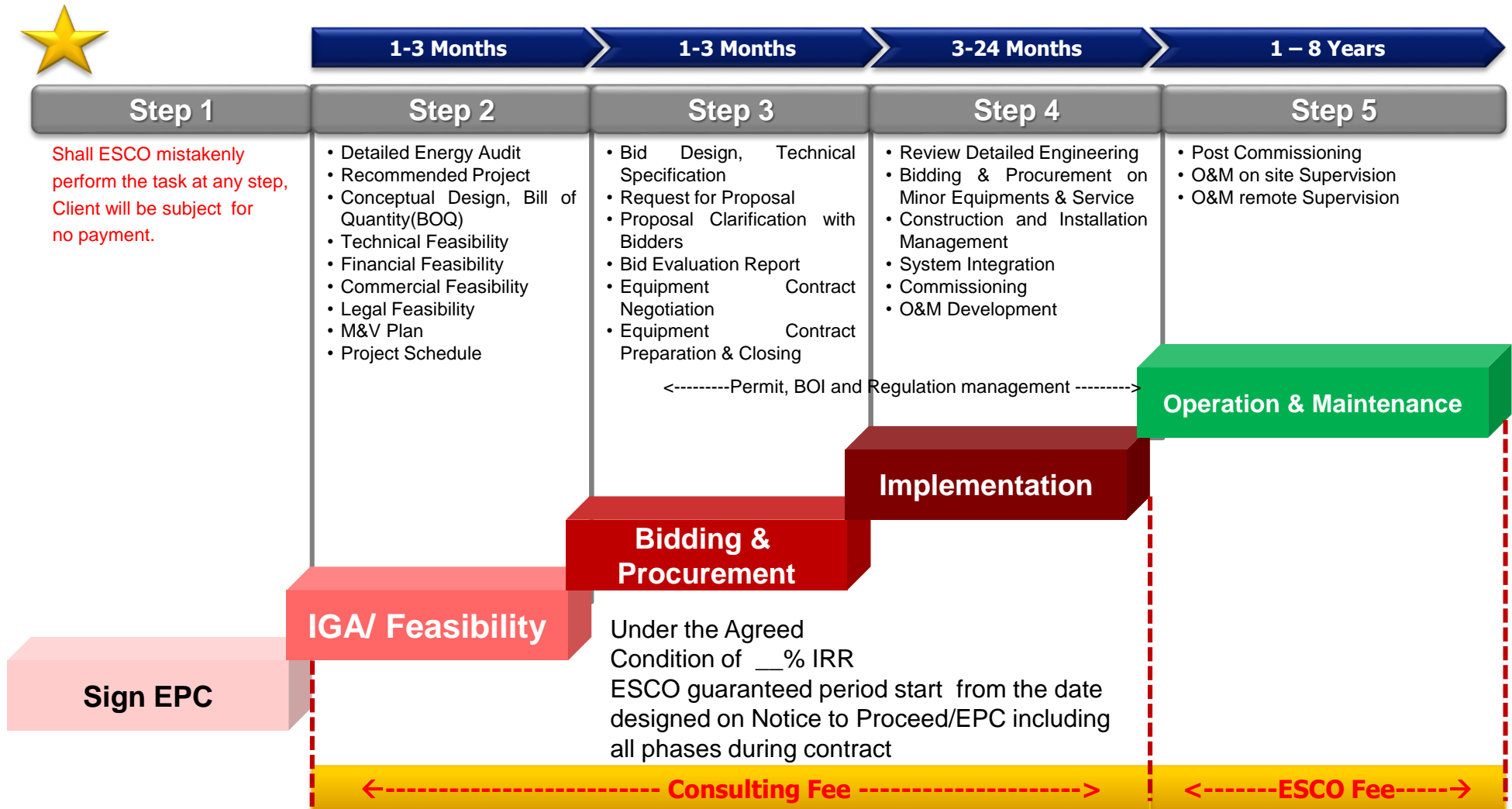
ESCO Method

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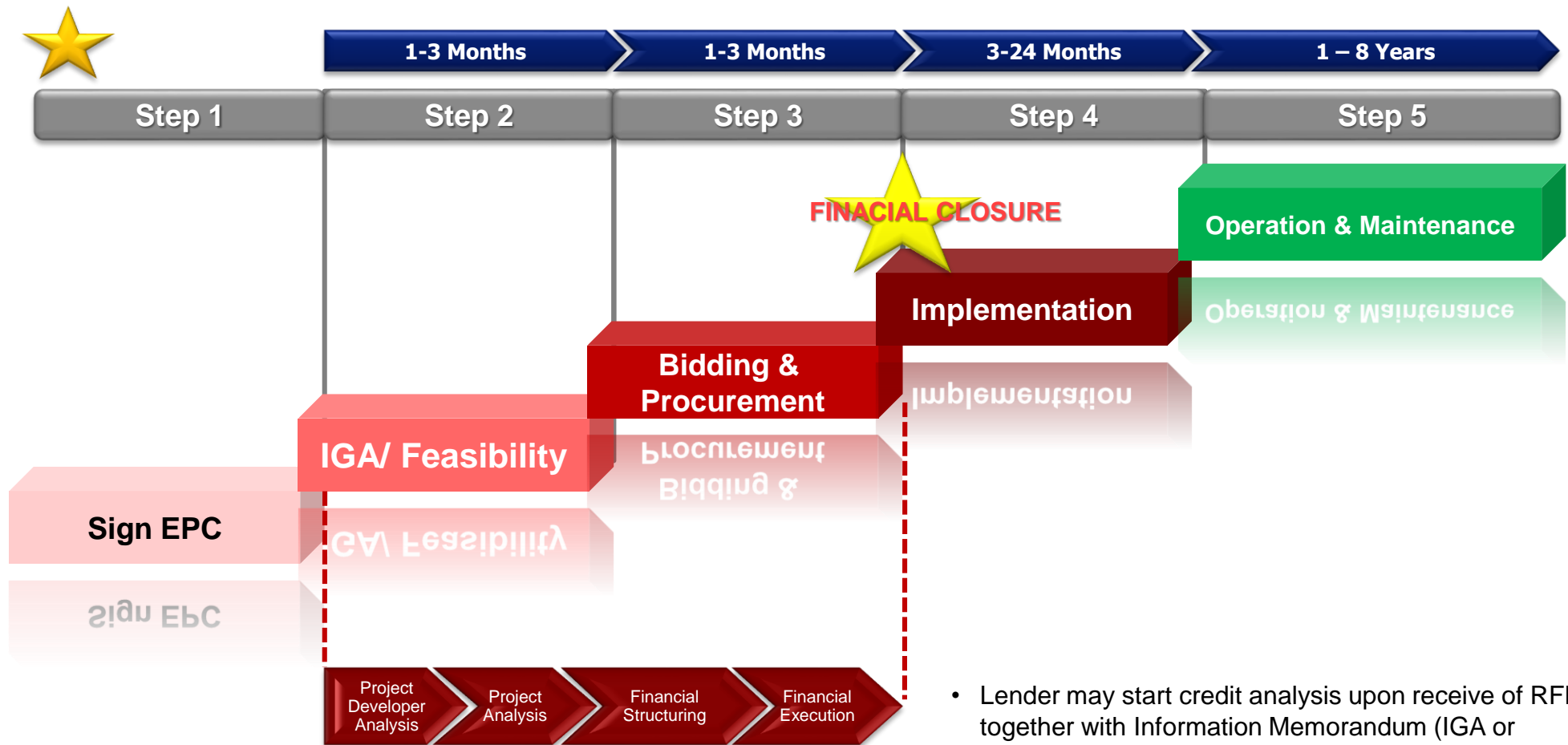
**Best-Practice Project
Delivery Methodology
+ EE Specific Tasks
+ESCO Specific Tasks**



Understanding ESCO Method



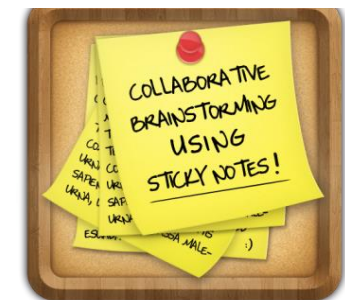
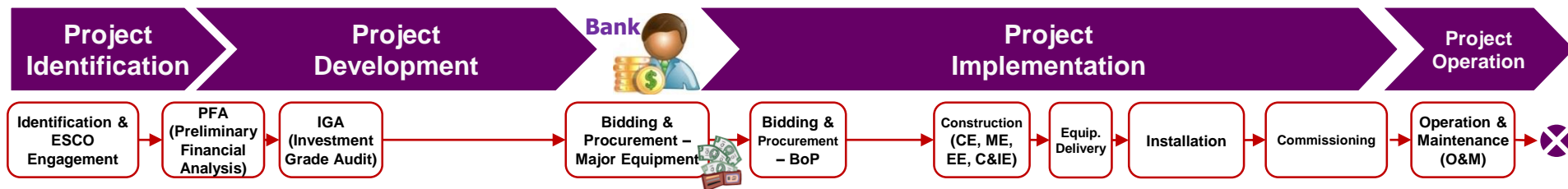
Understanding ESCO Method



- Lender may start credit analysis upon receive of RFP together with Information Memorandum (IGA or Feasibility as the case may be).
- Lender may review the key terms in Supply Contracts.

Group Activity:

What must be in ESCO Method?



...for example...

**ESCO
Project Delivery
Methodology**

=

ESCO Method

=

**Best-Practice
Project Delivery Methodology**

**+ EE Specific Tasks
+ ESCO Specific Tasks**

- Task (What)
- Time (When)
- Responsibility (by Whom):
Owner/ESCO/3rd Party (think of Scope Matrix)

- 3 post-it colors
- For 3 types
- Commissioning
- Energy Audit
- M&V, O&M?

...for example...

Thank you