ENERGY PERFORMANCE SERVICES

EPS

"Reg. U.S. Pat. & Tm. Off."

# *"ESCO/EE Barriers and Solutions in Southeast Asia"*

## First Malaysia ESCO Conference


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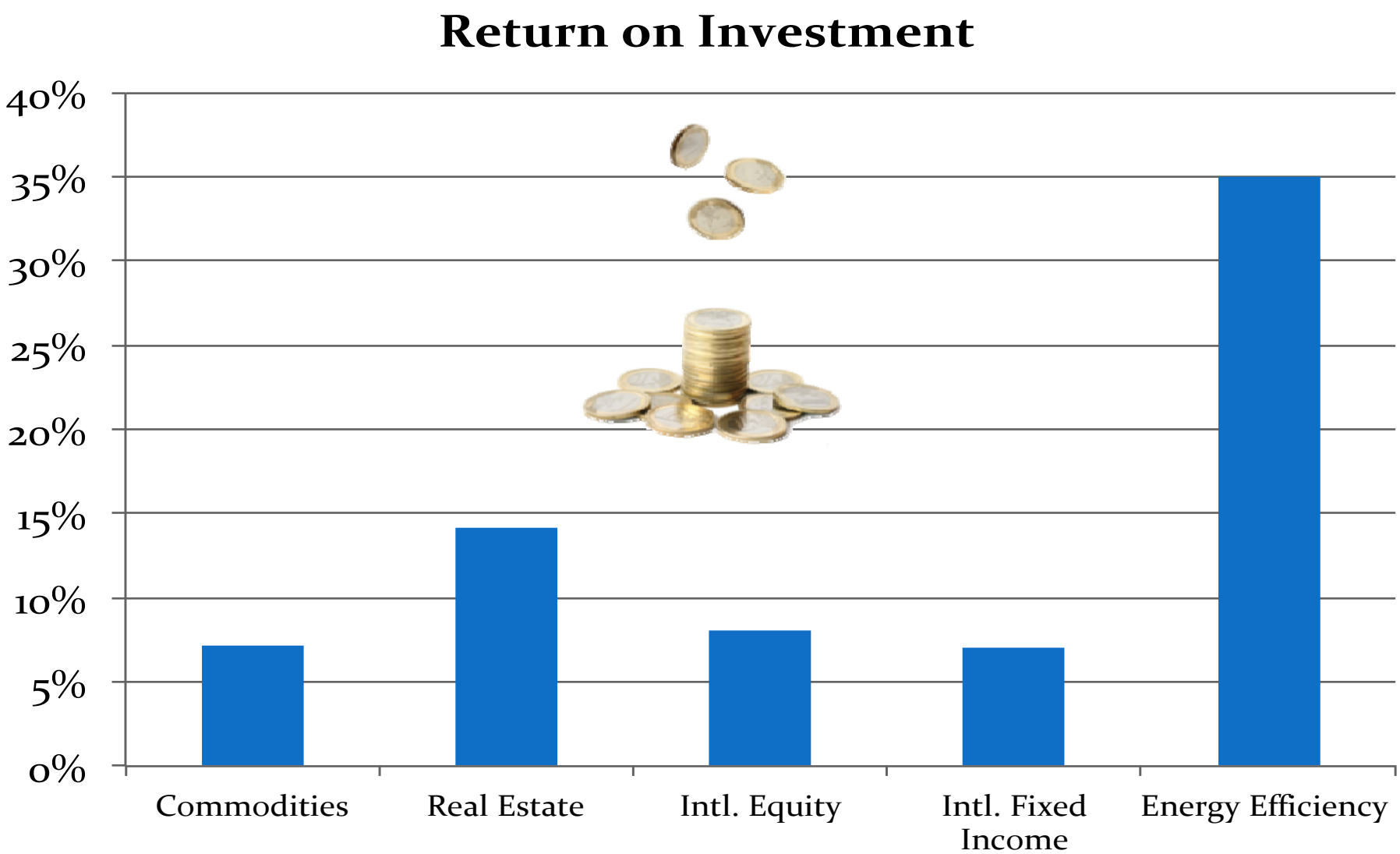
# *Why Energy Efficiency?*

- Energy Efficiency can apply "proven" cost-effective technologies to supply the World's projected electricity growth for Next 20 Years!
- EE is the "Cleanest" and "Cheapest" Energy:
  a. Don't generate EE = "0" GHG Emissions!!
  b. Costs less than 50% of Generated Power

- Quick paybacks = "Paid-From-Savings"
- IEA 2016 Report estimates EE must account for 38% of total cumulative emissions reductions to 2050 (versus 32% RE) to achieve 2º C scenario

# *Energy Efficiency Profitability - ROI*



# *Why EE Priority vs. Renewable Energy?*

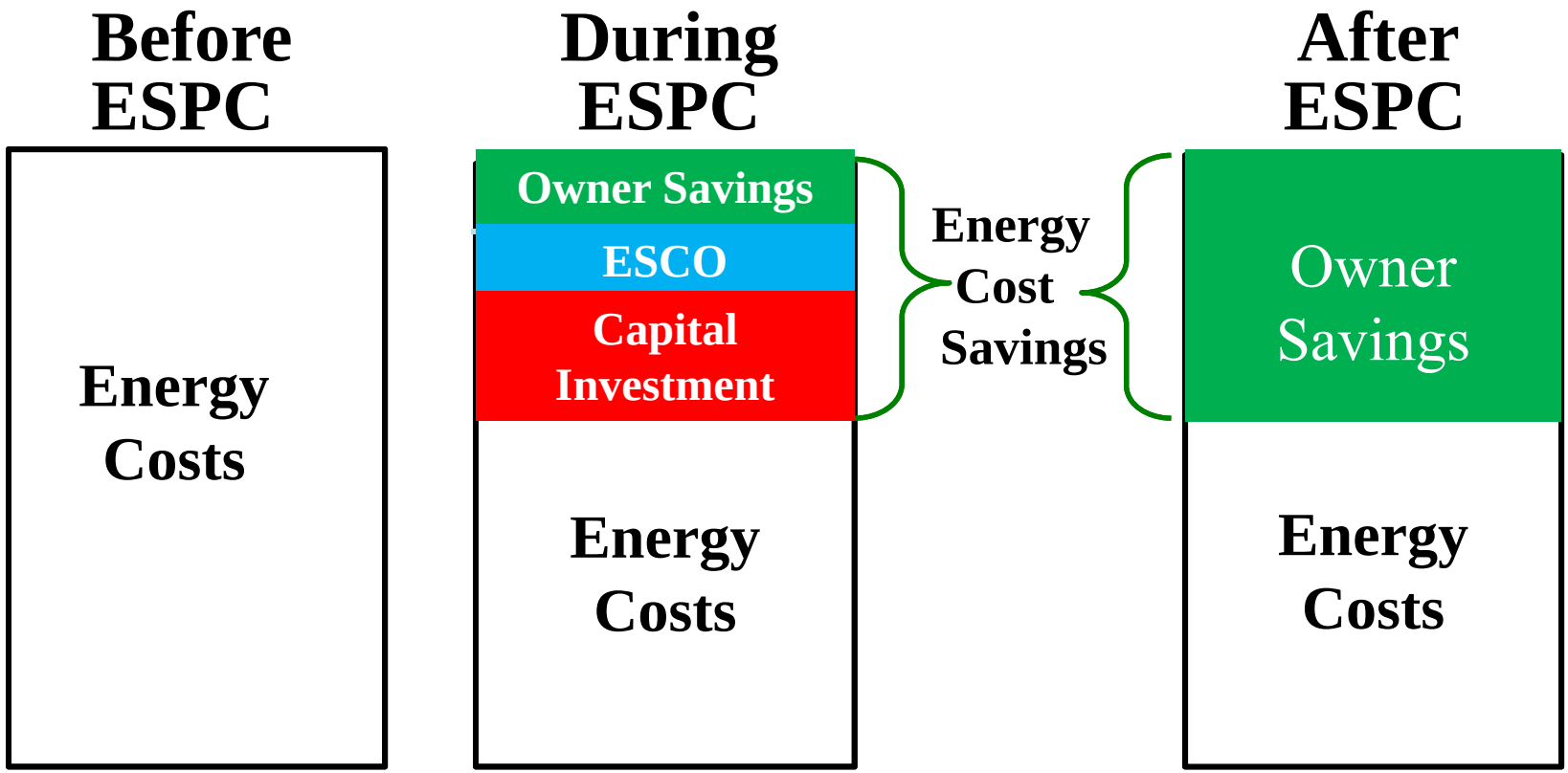
- ***RE*** displaces electricity supplied from the utility and ***does not reduce energy consumption,*** like EE
- ***EE*** should always be implemented before RE in order to reduce: **i)** the amount of electricity to be supplied and **ii)** size/capital cost of RE project
- The capital cost of a kWh saved with EE is at least 50% less than a kWh generated with RE
- EE profitability is not dependent on Feed-In-Tariffs subsidized by the government

# *Energy Services Company (ESCO) and Energy Savings Performance Contracting (ESPC)*

A Service Company that:

- develops, finances & implements energy efficiency and savings-based projects on a "turn-key" basis in end-use facilities.
- risks payments for its services on actual savings performance of EEP equipment installed.

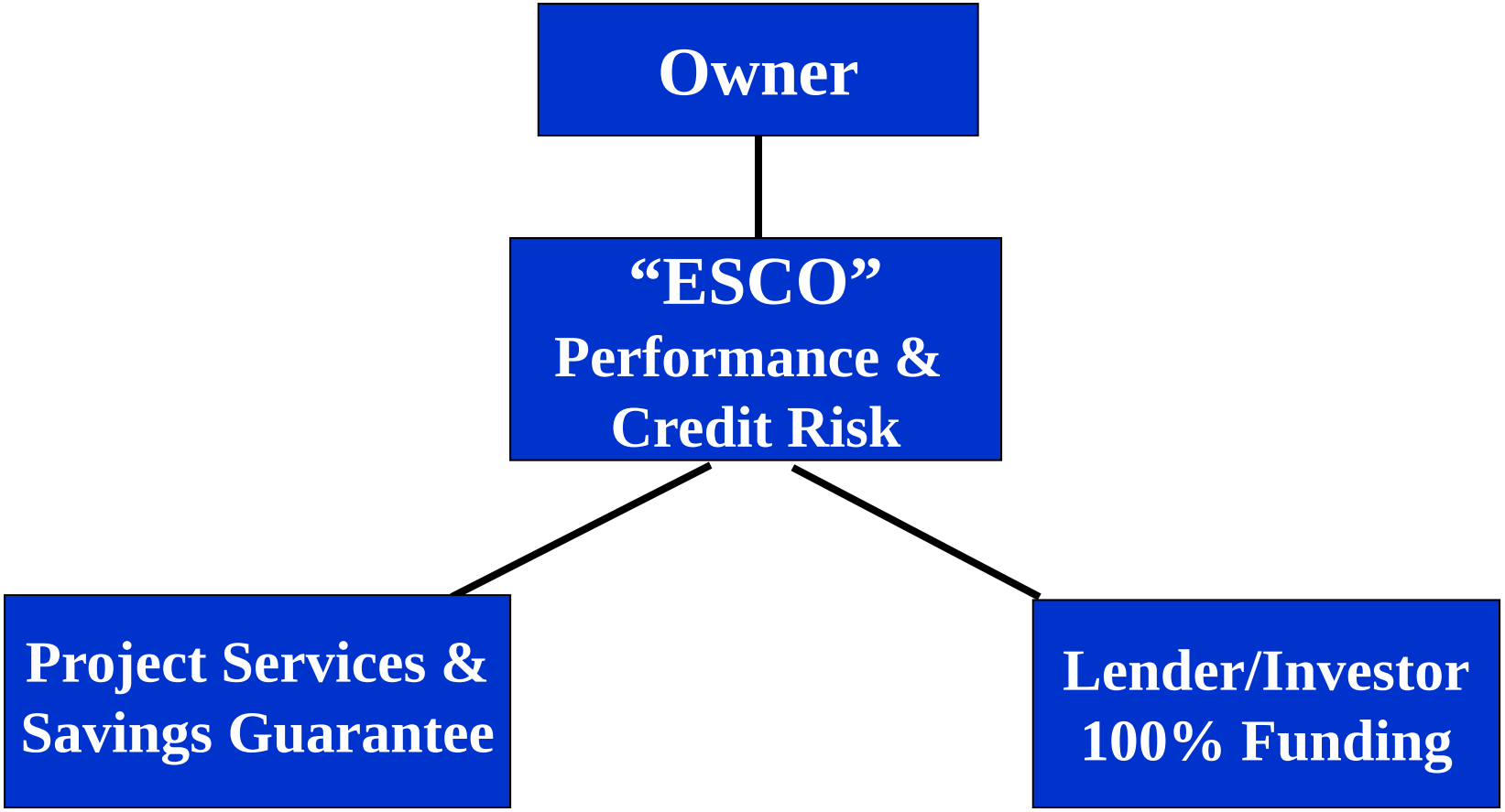
# *ESPC Illustration*



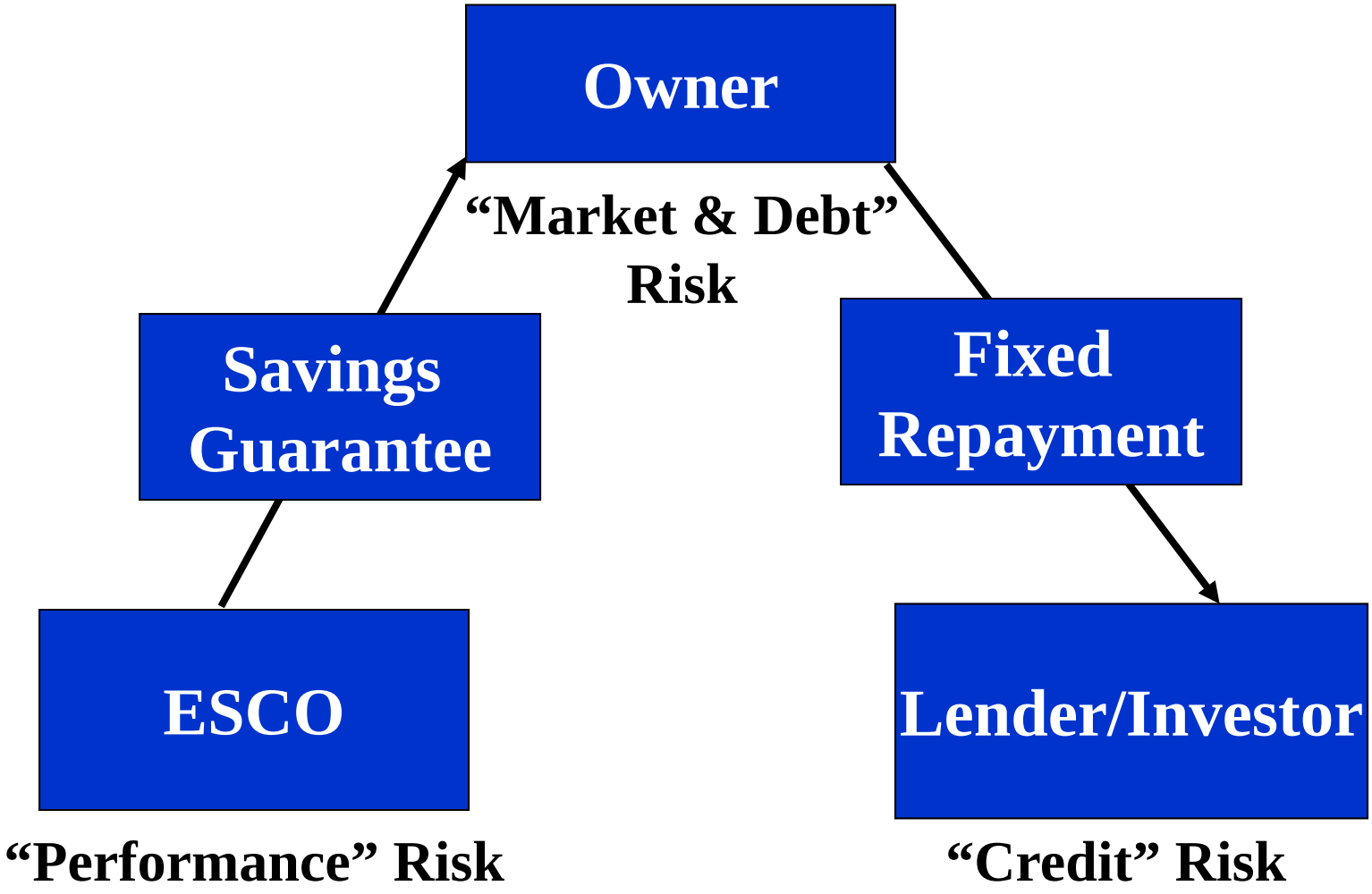
# *Facility Owner Benefits from ESPC*

- Capital Cost for new EE technologies paid from existing operating costs
- No risk for development, implementation and performance of EEPs
- Measured reductions in operating costs and GHG emissions (including CO2) from EEPs
- At end of term of the ESPC Agreement with ESCO, Owner owns EEPs and receives 100% of savings for long useful life of EE equipment

# *ESCO Shared Savings Structure*



# *ESCO Guaranteed Savings Structure*



# *Market Application Summary*

- ***Shared Savings*** Structure:
  - Good introductory model for developing markets because Owners assume no risk
  - Limits long-term growth and competition of the ESCO industry
- ***Guaranteed Savings*** Structure:
  - Difficult to use in introducing ESCO concept for developing markets because requires Owners to assume investment risks
  - Creates sustainable robust growth of ESCO Industry

# *ESCO "Bundled" Services*

- ***Project Development***
- ***Project Finance***
- ***Investment Grade Energy Audit (IGA)***
- ***Savings Measurement & Verification (IPMVP) and Performance Guarantees***
- Engineer, Procure and Construct (EPC)
- Ongoing O&M

# *What is an IGA?*

- Technical and economic foundation of an EEP for implementation (versus Project Concept)
- Purpose is to provide sufficient data to evaluate the feasibility and risks of implementing an EEP
- Documents all savings & cost estimates with assumptions, calculation and M&V methods
- IGA should minimally include:
  - Complete analysis of Base Year Energy for each fuel and costs and reconciliation to current operating conditions
  - Rationale and detailed analyses supporting the savings, EPC, O&M costs and payback for each ESM
  - Full description of all analysis methods, calculations, data input and assumptions for each measure

# *What is M&V?*

- M&V is the ***meter of an EEP***
- Required to calculate achieved energy savings with any degree of accuracy/reliability
- Calculating energy savings is unique:
  - Represents the absence of energy uses (not produced)
  - Cannot be 'measured' like generated kWhs
  - Is determined by measuring actual energy use versus an 'energy ***'Baseline***' (prior to EEP installation)

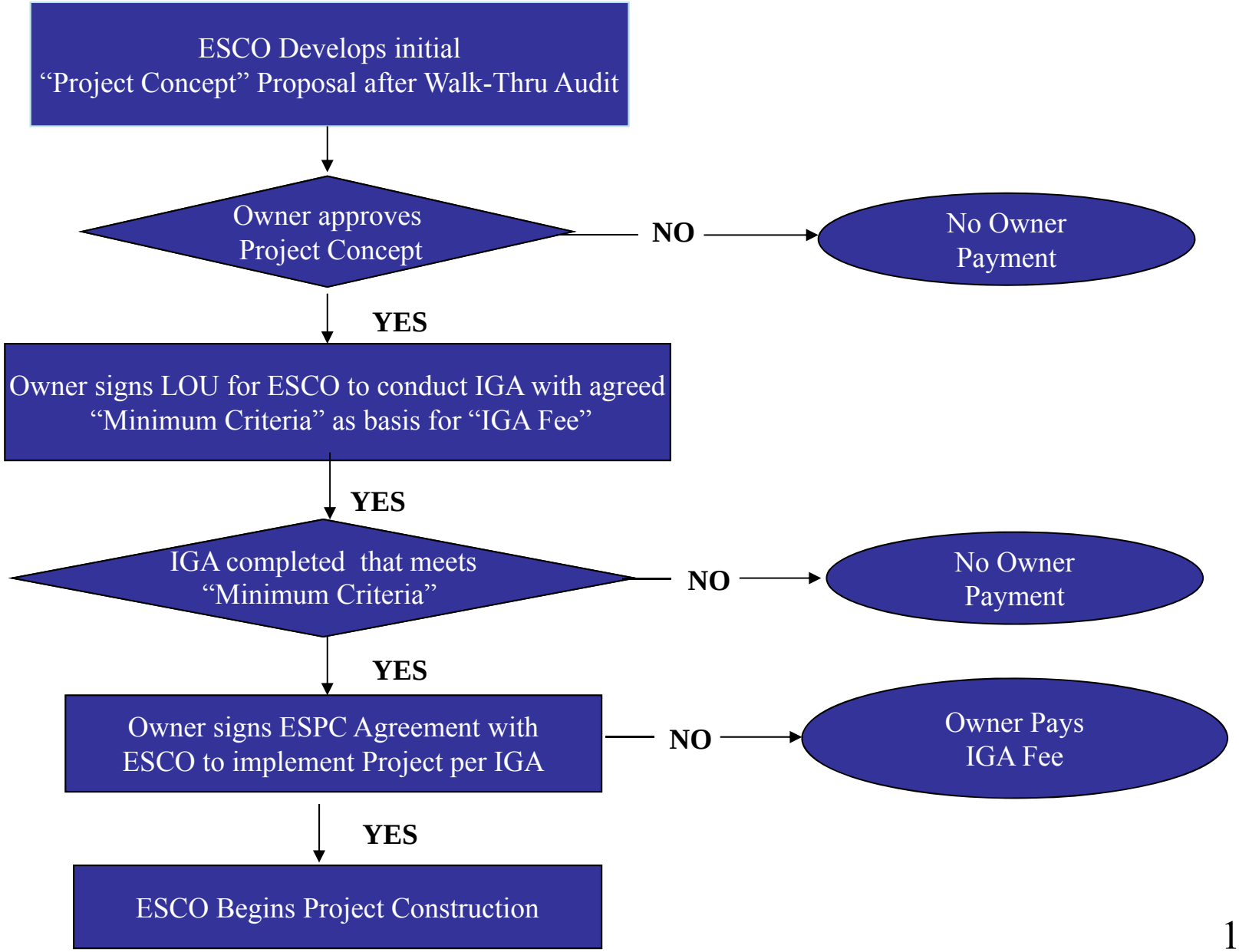
# *What is IPMVP?*

- Developed in 1996 and currently managed globally by Efficiency Valuation Organization (**EVO**): http://www.evo-world.org/
- Created by international energy engineering–based committee to reduce uncertainty to Measure & Verify End-Use energy savings
- **IPMVP is a "framework" of "definitions"** and "**guidelines**" on methodologies for assessing and measuring energy savings

# *ESCO Must Manage Risks*

- Development (Working Capital Investment)
  - ‘Paid-From-Savings’ EEP exists
  - Available long term project-based financing
- Construction (On time & On Budget
- Performance (Estimated Savings achieved)

# *Risk Mitigating ESCO Development Approach*



# *Financing is Key to ESCO Business*

- ESCO is a Service Company <u>not a Bank</u>
- ESCO cannot invest its Working Capital to Develop & Implement EEPs unless "Reliable" and "Commercially Viable" Long-term Project Financing is Available
- Project-based EE financing is mandatory to allow them to deliver "Shared Savings" business model
- ESCOs are '**SMEs**; who cannot provide the credit and equity needed to access debt from LFIs

# *Status of ESCOs in Indonesia*

- Huge opportunity but no EE market penetration due to market-wide '***EE Knowledge Void***'
  - Not aware of EE opportunities
  - No confidence in energy savings
  - Limited technical capacity
- No commercially-viable EE financing
- ESCO performance-based approach is great solution but industry is new and hampered by no project-based financing and limited technical capacity
- New ESCO Regulation (passed June 2016)

# *Purpose of Indonesia ESCO Regulation*

**<u>Provide credibility to ESCO industry:</u>**

- Standard Definitions
- Guidelines:
  - IGA
  - M&V
- Template ESPC Agreement
- Registration of ESCOs

# *Current Indonesia Action: Demonstrate ESPC model in Government Facilities*

## **Barriers**

- Multi-Year Contracts
- Procurement Procedures
- Budget Disincentive

## **Solution**:

- Developed a roadmap of modifications to existing government regulations that preclude ESCOs from providing ESPC services to government facilities

# *U.S. State ESPC Contract Lengths*

| State | Maximum ESPC Contract Term in Legislation (Years) |
|---|---|
| CA | Administrative decision - 7 years |
| CO | 25 |
| FL | 20 |
| IL | 10 years; 20 years for universities |
| KS | 30 |
| MA | 20 |
| MD | 15 |
| MO | 15 (legislation), 10 (administrative decision) |
| NY | 35 |
| PA | 15 |
| TX | 20 |
| WA | State financing terms - 30 years |

# *Current Indonesia Action: New ESCO Regulation for Government Facilities*

- Permits government agencies to enter into multi-year contracts
- Permits contracting outside the normal bidding laws
- Includes all facilities
- Designates a capable governmental entity to champion ESPC projects
- Funds technical resources required to facilitate developing/implementing ESPC projects
- Creates a common set of ESPC terms and project implementation and funding requirements

# *Long-Standing Barriers to Implementing Energy Efficiency Projects (EEPs)*

- Small and Complex transactions
- Barriers with Facility Owners (Gate Keepers!)
- No ***'Commercially-Attractive'*** financing
- In many developing markets:
  - ***Subsidized energy rates***
  - ***Limited EE Knowledge or complete 'Void'***
  - ***Limited Development or Technical capacity***
- No '***silver bullet***' solution to ***'scale-ability'***

# *EEP Barriers with Facility Owners*

- In many commercial buildings, utilities are paid by tenants versus owners of inefficient equipment
- In many industrial companies, EEPs viewed as very low priority ***Infrastructure*** versus ***Core Business*** investments (***don't fix if not broken***)
- Lack of Confidence in ***EE Technologies*** working ***and*** estimated future ***Savings*** being achieved or measured and verified
- Do not want to use their current 'Credit Capacity' needed in 'Core Business' to borrow for EEPs
- There is ***Lack of Confidence in EE Technologies*** working ***and*** in the estimated future ***Savings*** being achieved or measured and verified

# *No 'Commercially-Attractive' Financing*

- Problem is NOT a lack of available funds!
- Problem is that the available funds cannot be accessed by facility owners from local banks (**Banks**) on '***commercially-attractive***' terms
- Caused by ***'DISCONNECT'*** in current lending practices of Banks versus needs of facility owners (and Developers) in funding EEPs

# *What is Bank DISCONNECT?*

- Banks offer asset-based, corporate lending limited to 70% of EEP capital cost requiring:
  - 30% equity investment in EEPs and
  - 100% Collateral or Guarantees on loan amount
- Banks do not believe savings of EEPs = increased credit capacity to Facility Owners
- Only "Collateral Value" of EEPs is the Savings
- Limited interest in EEPs due to small transactions, complexities and inability to evaluate risks/benefits
- ESCOs are an optimum solution to aggregate EEPs, but most are SMEs with limited financial capacity

# *Challenges for Banks to provide 'Commercially-Attractive' EEP Finance*

- Limited EE Knowledge and Capacity
- Not Appealing (small and complex)
- Not 'Business as Usual' (Project-based)
- Insufficient Collateral
- No confidence in future cash flow
- Limited local EEP Development Capacity

# *SOLUTION to EE and ESCO Finance and Facility Owner Barriers:*

## ***NEW EEP FINANCE PRODUCTS***

Develop acceptance of existing EEP Finance Products

- enable ESCOs to apply '*Guaranteed Savings*' Model
- Attractive to Facility Owners
- Reduce barriers, risks and transaction costs for Banks:

1. **EEP Loan Product**

2. **Energy Savings Insurance Product**

# *EEP Loan Product Terms*
## (Indonesia Eximbank/ADB EEP Finance Program)

- EEP Loan is provided as additional debt to current lending capacity of ***creditworthy*** Facility Owners
- Loan Amount = 70%+ of EEP Capital Cost
- No collateral required beyond EEP equipment
- Repayment Term = 2 times EEP's Simple Payback
- EE Savings and Capital Costs must be supported by a properly-prepared IGA
- EE Savings must be Measured & Verified using industry-accepted methods complying with IPMVP

# *Energy Savings Insurance (ESI)*

- Guarantees savings of EEPs (***not Facility Owner Credit Risk)***
- ESI specifically covers any performance-related shortfall in savings versus Facility Owner's debt service payments to Bank on the related EEP loan
- ESI's objective is to eliminate the risk and instill confidence in Facility Owners and Banks that future EEP savings (cash flow) will be achieved

# *Benefits of New EEP Finance Products*

- Creates a new EE lending product for banks that is '***attractive***' to Facility Owners
- Instills confidence in Facility Owners and Banks that estimated EE savings will be achieved
- Reduces need for Facility Owners to use their 'core credit' capacity for financing of EEPs
- Removes risk for Banks to increase credit capacity and reduce collateral on EEP Loans
- Helps overcome the EE knowledge, technical and finance gaps in market
- ESI can facilitate ESCO's ability to apply preferred ***Guaranteed Savings*** financing structure