



# RETROFITTING PUBLIC BUILDINGS

*Bridging the EE  
“Perception Gap”*

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# EPC – essential component of EE

- EE commonly defined as achieving higher energy output per unit input of energy
- EE has always been marketed through government policy and regulation, G2G partnerships, commercially driven labeling programs, etc
- Typical EE “financing” includes government grants, incentives, adjusted tariffs, etc
- Energy Performance Contracting (EPC) is an innovative financing where it allows consumers to repay capital investment through cost savings achieved



# Conventional EPC – common issues

- The idea of EPC has always been repayment of investment (by ESCO) through savings achieved, over the repayment period
- Savings measured from actual consumption (kWh)
- Inhibits client to expand/change operations. Relies heavily on BEI pattern established on Year 1
- Maintenance contract issues – ESCO needs to be involved to safeguard
- Additional component in EPC – standalone metering increases cost
- Risk is skewed towards ESCO – increase in premium/interest



# Conventional EPC – repercussions

- Lack of real ESCO organizations, with real investor portfolio
- Long discussion over contractual issues prior to EPC kick-starting
- Only attractive buildings (with attractive payback) are considered
- Drains ESCO's time commitment to individual projects and limits expansion – not ideal for market expansion!





# New Approach to EPC

*Audit works. EPC negotiations from results. Resulting in agreement.*

*Monitoring. Post installation, M&V done on IPMVP principles. Monitoring and reporting for repayment period.*



*Design phase. Involves technical meeting with contractors. Sourcing equipment with highest eff and ratings.*

*Procurement. Carried out solely by the ESCO. No existing ties with manufacturers.*



# New Approach to EPC

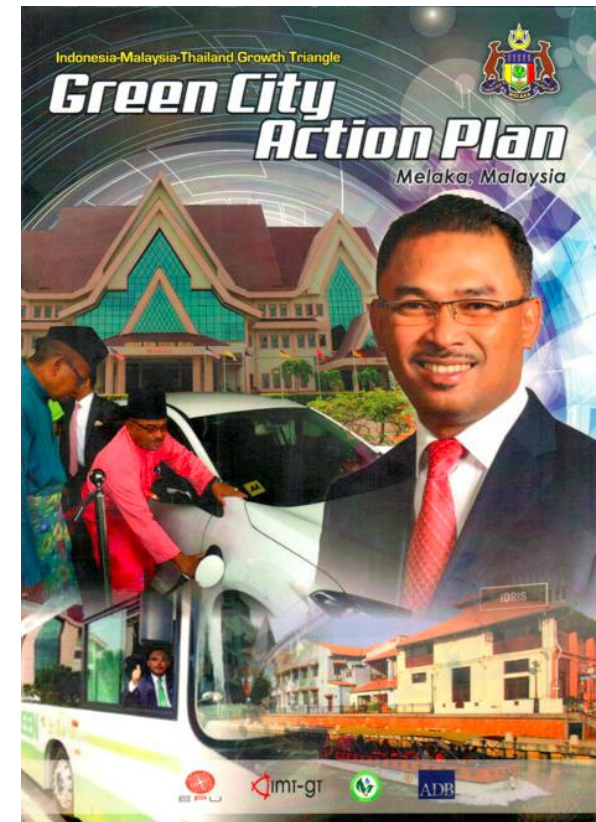
- Savings is measured through kW and kW/ton measured
  - Buildings owners have the liberty to expand and revise operational strategy or building function
  - ESCO does not involve in maintenance contract – building owner is in full control of building O&M or FM
  - No additional metering involved
  - Risk is balanced – better rates!
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- Driven top-down!
  - Crisp planning, with a central project coordinator
  - IPMVP





# Melaka Green City

- The Malaysian State of Malacca has prepared a Green Technology Blue Print in which it plans to become a Green State and Malacca City a Green City by 2020
- ADB provided TA for the Green City Action Plan
- Improve energy efficiency in all State owned buildings – a total of 95 buildings
- 9 Buildings are selected for the pilot phase and will be targeted first



# Building Selection







# Programmatic EE Retrofitting

- EE retrofitting programme for all state-owned buildings
- Bundle large and small buildings
- Standardized measures
- Special projects for larger EE projects in specific buildings





# EE Investment Portfolio

- Danish Energy Efficiency Partners (DEEP) is founded by Danish Energy Management Group and the Danish Investment Fund (IFU) with funding from the Danish Climate Investment Fund (DCIF)
- One stop shop for design, implementation and finance of EE projects
- Investment size expected to reach USD 100 Mill. over the next 5 years
- More than 1.5 Mill. sqm. of building area





# Inspired by Danish Green Cities



- City of Aarhus, Denmark targets CO<sub>2</sub> neutrality by 2030
- Danish Energy Management & Esbensen undertakes retrofitting of 1 Mill. sm. of public buildings in the city
- Planned investment of approx. USD 100 Mill. over the next 5 years





thank you