

# **Energy Conservation Experience of an Energy Service Company**

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**DOE-IPO VISAYAS ENERGY INVESTMENT FORUM**

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# Agenda

- **Energy Service Company (ESCO)**
  - Introduction
  - Services
- **Energy Performance Contract (EPC)**
  - Overview
  - Guaranteed & Shared Saving Contract
- **Energy Conservation Experience**
  - Energy Efficiency Improvement
  - Optimization on IoT Platform
  - Constraints

# Energy Service Company (ESCO)

# ESCO Introduction

- An ESCO is defined as a company engaged in developing, financing, engineering, installing, maintaining and operating *comprehensive, performance-based* projects centered on improving the energy efficiency of a facility over a period of time (depending on the investment amount).
- Projects are *performance-based* when the ESCO's compensation, and often project-financing, are meaningfully tied to the amount of energy actually saved.

# ESCO Introduction

- Employs a wide array of cost-effective measures including high efficiency lighting, high efficiency HVAC equipments, efficient motors, variable speed drives, power quality improvements, and centralized energy management systems.

# ESCO Services

- **Feasibility and energy analysis**
- **Project Development, Design, and Engineering**
- **Ability to finance directly or arrange third party financing**
- **General Contracting**
- **Project and Construction Management**
- **Purchase and Installation of Equipment**
- **Risk management**
- **Monitoring and Verification of Savings**
- **Training**
- **Operations and Maintenance**
- **Administrative services**

# Energy Services Offered by Various Types of Providers

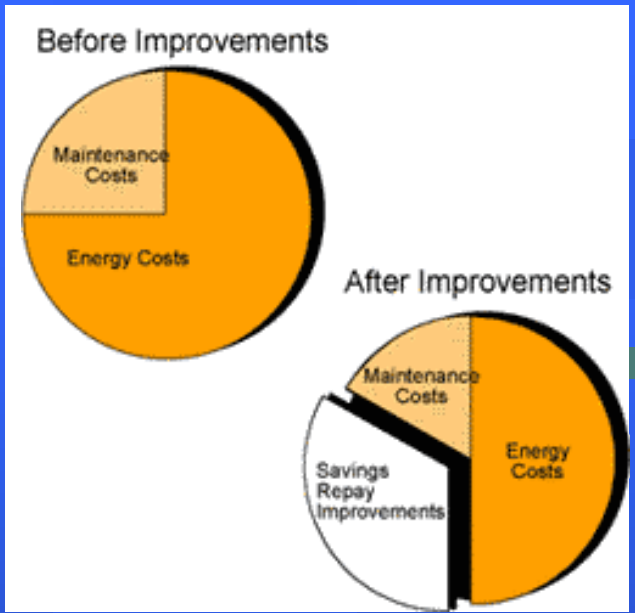
ENERGY SERVICE	ESCO'S	VENDORS	CONTRACTORS	A&E DESIGN/BUILD FIRMS	CONSULTANTS
Energy Audit	X		X	X	X
Engineering Design	X		X	X	X
Equipment Installation	X	X	X	X	
Construction & Proj. Mgt.	X		X	X	
Performance Monitoring & Verification	X				X
Performance Guarantees	X				
Commissioning	X	X	X	X	
Financing	X	X			
Integrator	X	X			7
<b>Source: Goldman &amp; Dayton</b>					

# Energy Performance Contract (EPC)

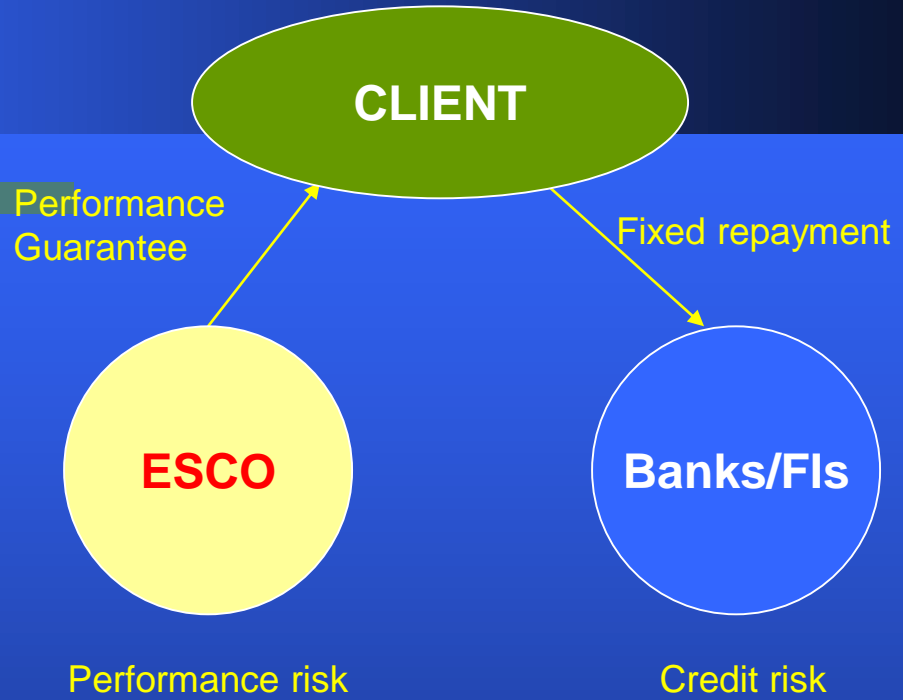


# Energy Performance Contract

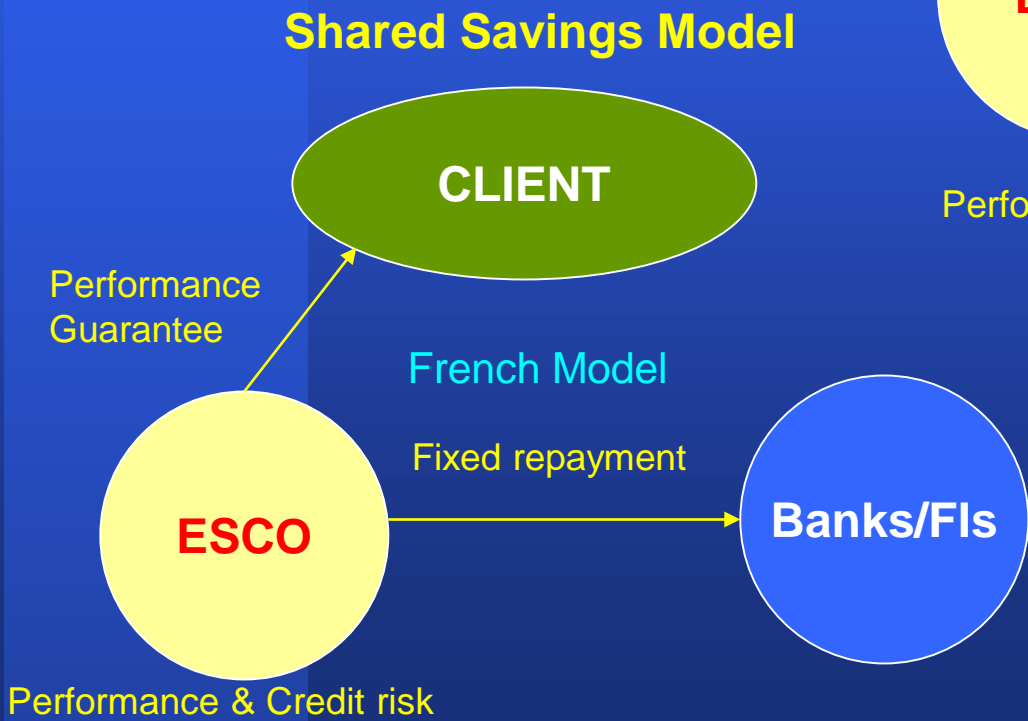
- A contract with payments based on performance. Generally, it is based on guaranteed future energy savings.
- For the Owner: Performance Contracting enables expenses to be redirected into a revenue stream without any upfront capital costs.
- Compensation based on measured results.
- Offered by ESCO as a project that will pay for itself.



## Guaranteed Savings Model



## North American Model



# Guaranteed Savings Contract

- **Type of contract with lower risks for the ESCO**
- **Project is usually financed through a third-party bank or the customer itself. ESCO helps to arrange financing**
- **ESCO provides a guarantee that a certain amount of savings will be realized.**
- **Client must be sure that the ESCO is well established and has credibility as well as experience.**

# Guaranteed Savings Contract

- In the event that the realized savings are below the guaranteed amount, the ESCO pays the Client the difference.
- The Client owns the equipment, and the ESCO is paid partly from a fee on construction management, and partly from a share of any savings above the guaranteed amount.

# Guaranteed Savings Contract

- **Cost: a fixed total cost is presented to the Client**
- **Duration: generally fixed**
- **ESCO will guarantee that the savings would cover debt service costs. However, the ESCO could negotiate to guarantee any benchmark that is appropriate**

# Guaranteed Savings Contracts



Realized energy savings



Option : Payment after monitoring

Client retains 100% of savings

Bank loan to client who provides guarantees.



Client

Client pay the ESCO after the implementation according to the performance.

Client reimburses the loan directly to the bank.

Or pay 100 % of the costs and the ESCO reimburses the savings deficit each year



ESCO



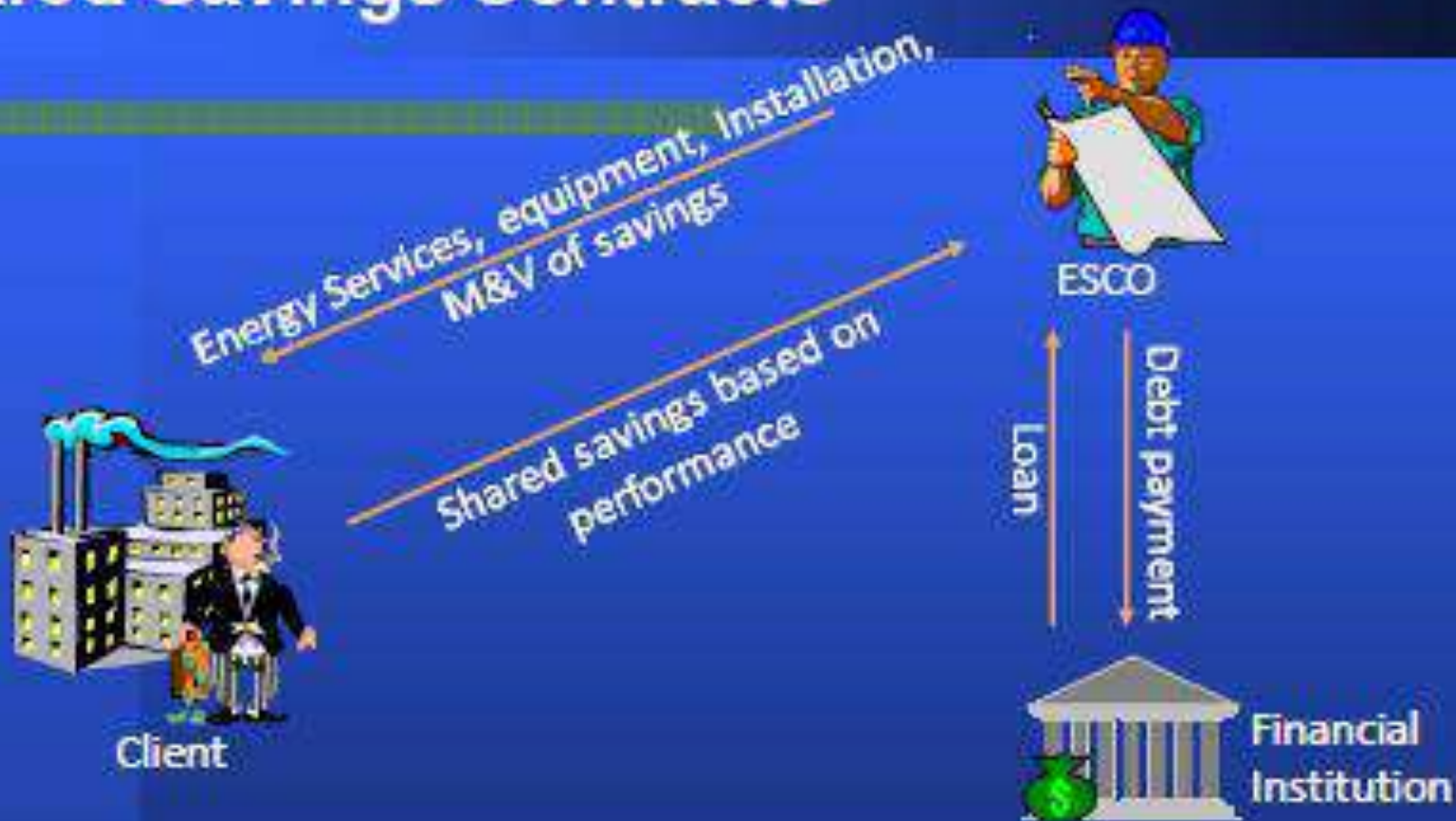
Financial Institution

# Shared Savings Contract

- **ESCO paid solely from a share of the savings**
- **Usually found in market where there is little or no competition**
- **ESCO take usually higher risk in a new market and try to introduce more profitable scheme**
- **If the ESCO provides financing, the ESCO will typically take a large portion of the savings for a fixed period (corresponding to a notional repayment of debt)**

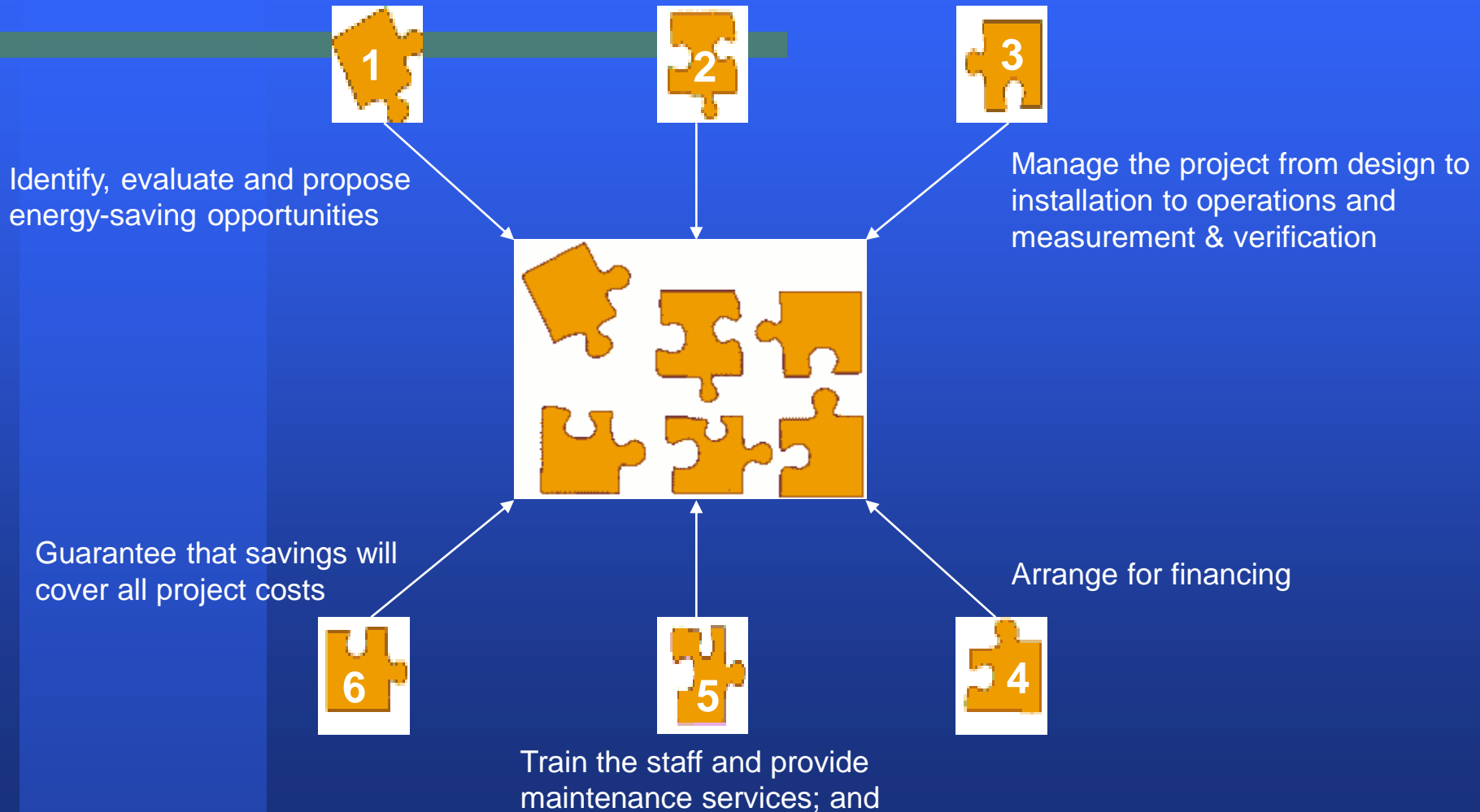


# Shared Savings Contracts





# ESCO Can Help To Put Together the Pieces



# Client Advantages

- Use **FUTURE** energy and operational savings **NOW**.
- Upgrade facilities **without front-end cost**.
- **Cut operating costs** and be more competitive.
- Improve comfort and productivity.
- Gain **opportunity value for money** for use on projects focused on core competence.
- Get **guaranteed performance** and results.
- **Positive** cash flow. (The measures usually generate savings that exceed the guarantee.)
- **Risks** (technical, financial and operational) normally incurred by Client are absorbed by the ESCO.

# **Energy Service Company (ESCO) Experience in the Philippines**

**Energy Service Company (ESCO)  
Experience in the Philippines  
(Energy Efficiency Improvement)**

# HVAC EQUIPMENTS

## (Before Retrofit)

EQUIPMENT	# OF UNITS	RATED kW	BRAND
WATER-COOLED CHILLERS	2	533	TRANE
	2	628	YORK
	1	541	TRANE
PCHWPs	5	37.3	LINCOLN
SCHWPs	5	75	LINCOLN
COWPs	5	75	LINCOLN
CTs	6	22.38	TECO
AIR-COOLED CHILLERS	5	112	YORK
CHWPs	3	15	TECO
CHWPs	4	22.38	TECO

**TOTAL RATED kW = 4,628 kW**

# HVAC EQUIPMENTS

## (After Retrofit)

EQUIPMENT	# OF UNITS	RATED kW	BRAND
WATER-COOLED CHILLERS	4	488	TRANE
CHWPs	5	75	TECO
COWPs	5	45	TECO
COOLING TOWERS	6	56	TECO

**TOTAL RATED kW = 2,887 kW**

# ENERGY INTENSITY

FISCAL YEAR	BILLING PERIOD	ELECTRICITY CONSUMPTION				TOTAL FLOOR AREA (m <sup>2</sup> )	ENERGY CONSUMPTION DENSITY	
		kWh		LOE			kWh/m <sup>2</sup>	LOE/m <sup>2</sup>
		QUARTERLY	ANNUALLY	QUARTERLY	ANNUALLY			
2006	Jul - Sept '05	7,904,800	28,448,662	2,063,153	7,425,101	165,514.3	172	45
	Oct - Dec '05	7,905,000		2,063,205				
	Jan - Mar '06	6,320,467		1,649,642				
	Apr - Jun '06	6,318,395		1,649,101				
2007	Jul - Sept '06	6,207,736	24,807,344	1,620,219	6,474,717	165,514.3	150	39
	Oct - Dec '06	6,246,346		1,630,296				
	Jan - Mar '07	5,950,906		1,553,186				
	Apr - Jun '07	6,402,356		1,671,015				
2008	Jul - Sept '07	5,941,051	23,277,897	1,550,614	6,075,531	165,514.3	141	37
	Oct - Dec '07	5,738,592		1,497,772				
	Jan - Mar '08	5,684,210		1,483,579				
	Apr - Jun '08	5,914,044		1,543,566				
2009	Jul - Sept '08	5,692,533	21,714,335	1,485,751	5,667,441	165,514.3	131	34
	Oct - Dec '08	5,216,241		1,361,439				
	Jan - Mar '09	5,265,508		1,374,298				
	Apr - Jun '09	5,540,053		1,445,954				

# DOE Don Emilio Abello Energy Efficiency Awards

GUARANTEED ● SUSTAINED ● COMPREHEND ● CONSISTENT ● PERSISTENT ● DETERMINED ● COMMITTED



2007



2008



2009



2010



2011



2009  
*(HALL OF FAME)*



2008



2009

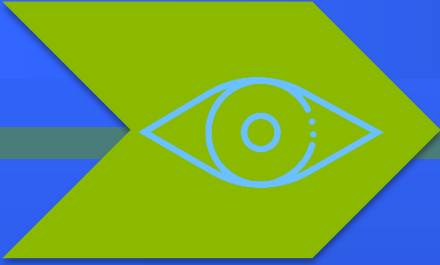


**OUTSTANDING AWARDEE ON ENERGY EFFICIENCY BY THE DEPARTMENT OF ENERGY FOR  
SM NORTH EDSA MALL PROJECT & SM STA. MESA MALL PROJECT  
(CATEGORY: COMMERCIAL BUILDING)**

**5 CONSECUTIVE YEARS OF EXCELLENCE IN ENERGY SERVICE**



# **Energy Service Company (ESCO) Experience in the Philippines (Optimization on IoT Platform)**



## SEE

- Data Collection
- Monitoring
- Alarm

## ANALYZE

- Benchmark
- Rate
- Identify
- Recommend

## ACT

- Implement
- Maintain
- Improve

## SOLUTION



*Web-based pilot tool for decision support and action*

# Multi-Sites Management Software

## DASHBOARDS

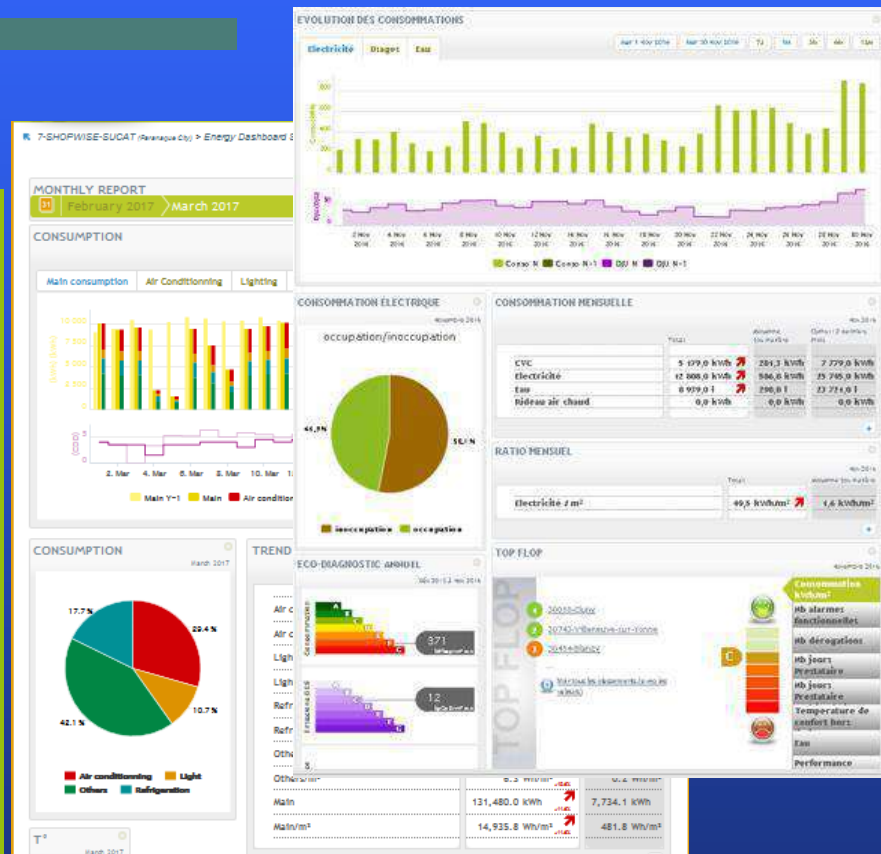
The right information for each user

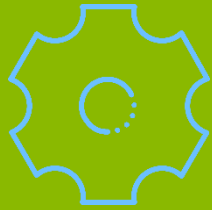
Chart tool for data analysis and export

Turn a collection of datas into usefull information

Simple navigation and user guidance

All important information at a glance





**0**

**Equipment  
replaced**



up to **15** %

**Energy savings**



**12**

**Don Emilio  
Abella Energy  
Efficiency  
Awards 2017,  
Department of  
Energy - Philippines**



**18**

**Months ROI**

# **Energy Service Company (ESCO) Experience in the Philippines (Constraints)**

# Constraints to ESCO Growth

- **Funding**
  - Energy Efficiency Financing Fund
- **Government Incentives (EE&C Law R.A. No. 11285)**
  - Importation Duty Exemption
  - Tax holiday for providers
- **Government procurement, accounting/auditing system does not recognize “Energy Performance Contract Schemes”**
  - Policy change needed
  - Revise provisions of BOT particularly the range in cost of projects that will qualify in order to accommodate ESCO activities which are generally with lower cost component
- **Lack of Certified Energy Managers**
- **Capacity building**

ESCO's approach Energy Savings with a **holistic approach** and look into total systems rather than just "changing bigger and better equipment"

**We do not represent any brand**



Turning down the energy:  
Tuning up the Profits!!!

**ESCO's commitment is for the facility/building optimization. To operate mechanical and electrical equipment and systems in a manner which is mutually beneficial for :**

- **The building owner,**
- **The building operator,**
- **The building occupants, and**
- **The environment.**



# End of Presentation

**Thank you very much  
for your attention  
and have a nice day !**

**Richard A. Uy 5/30/2019**

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