

Energy Savings Performance Contracting

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Energy Efficiency in MENA - Workshop

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The energy efficiency market in the region has finally picked-up and so the need to have in place proper energy performance contracting schemes

The Dubai alone, the government plans to support retrofits for 30,000 existing buildings.

- AED 45 billion annual utility bill
- AED 12 billion in annual energy savings
- **AED 25 billion investment in energy conservation measures**



What is energy performance contracting?

Energy Savings Performance Contracts (ESPC) is the legally-binding contractual model between the Energy Service Provider (ESCOs) and the customer for the implementation of energy and water conservation measures (ECMs).

- Defines scope of works for the implementation, operation, and maintenance of ECMs.
- Provides minimum levels of performance (energy savings / comfort levels).
- Defines the responsibilities of each of the parties (operation, maintenance, information...)
- Defines the baseline and method to Measure and Verify (M&V) the energy savings.
- Defines the termination value

There are basically two types of energy performance contracts

- **Guaranteed savings**

- Upfront investment by customer
- Payments to ESCO based on project implementation milestones
- Measurement & verification of savings over contract period – performance bond



Best fit for companies looking for...

- Maximize energy savings
- No finance / budget constraints for upfront investment
- Commitment from ESCO / guaranteed savings

- **Shared-savings**

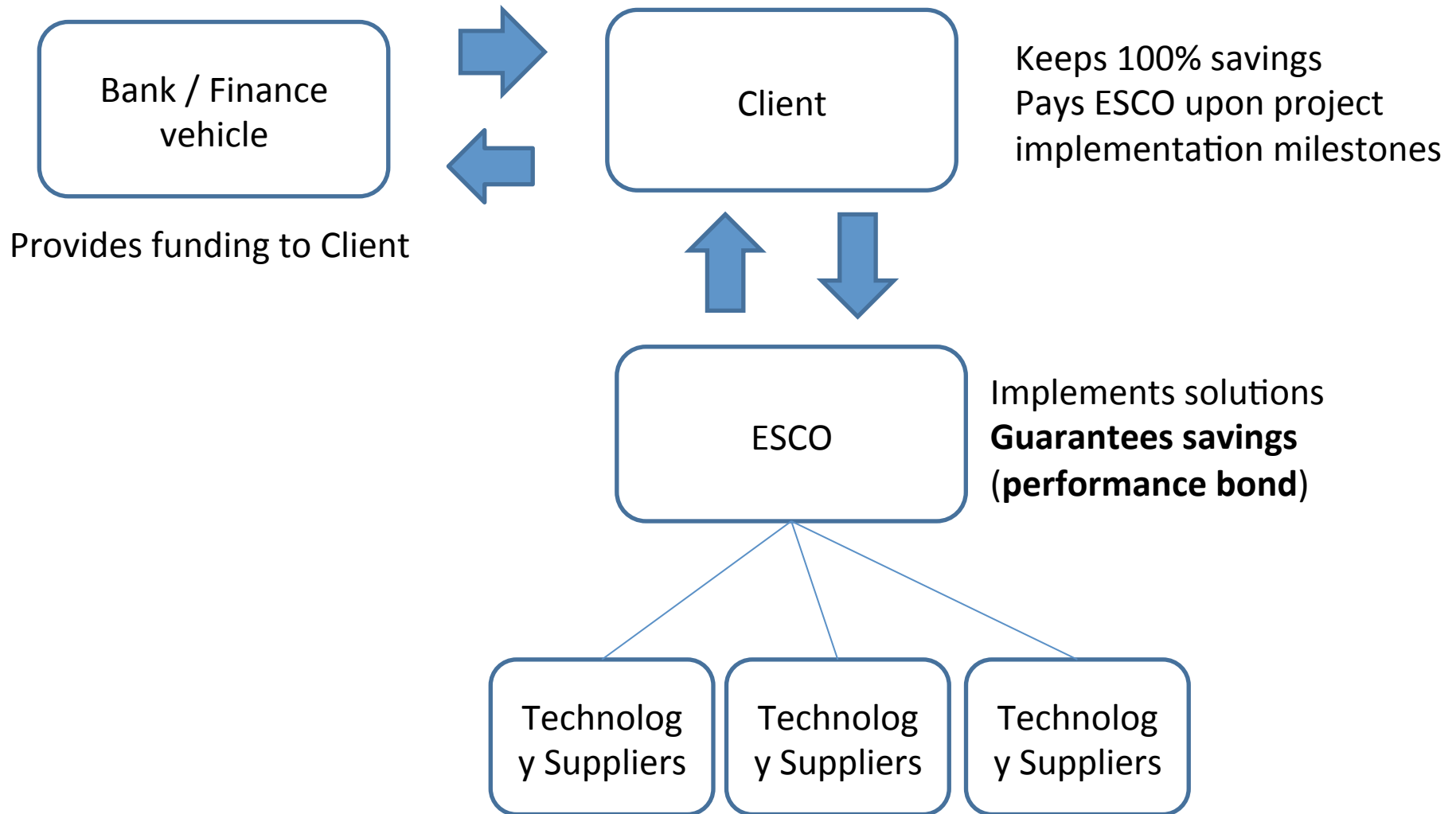
- Upfront investment by ESCO
- Payments to ESCO based on achievement of savings (as % of actual savings)
- Measurement & verification of savings over contract period –



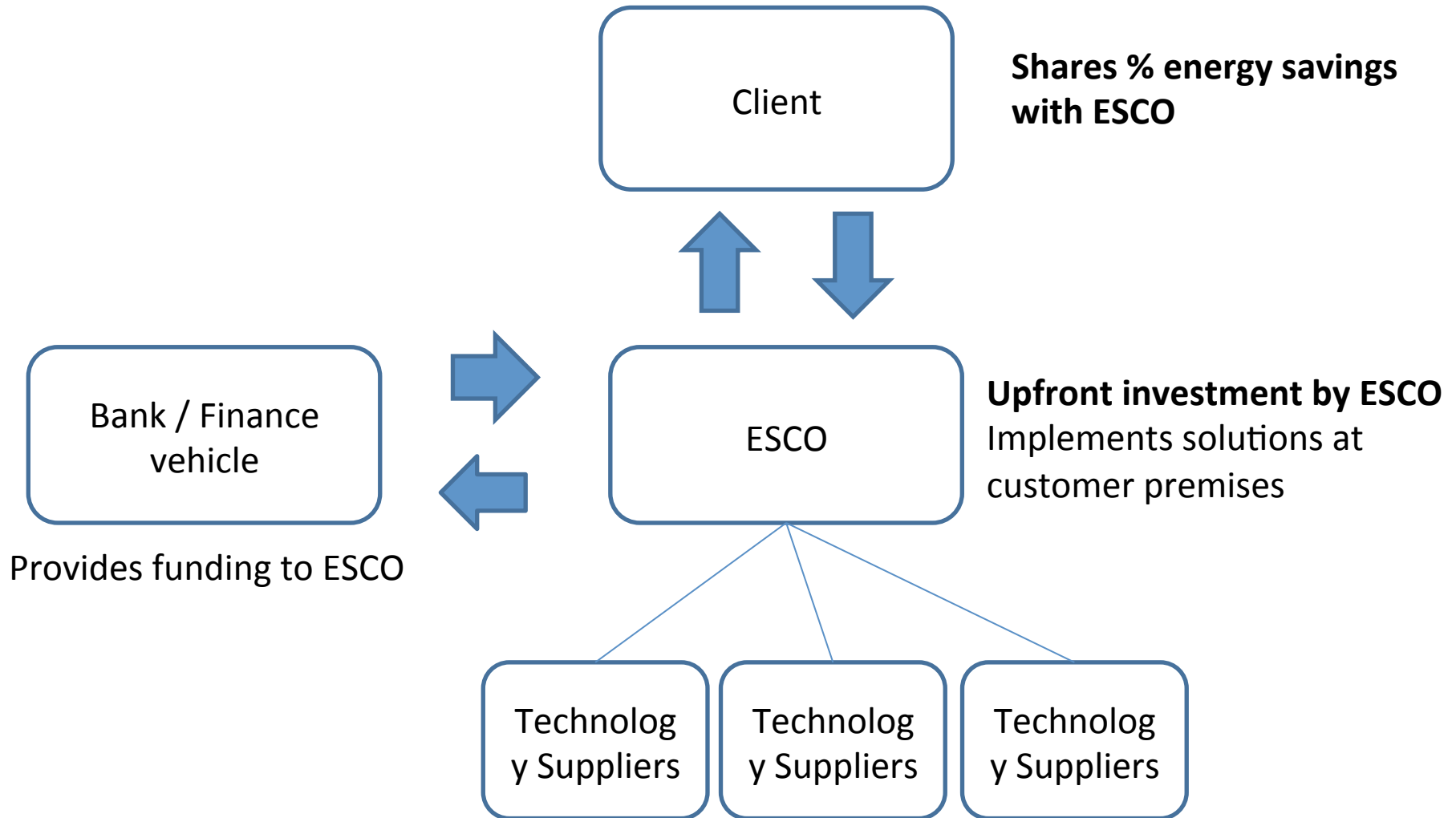
Best fit for companies looking for...

- No upfront capex / Positive cash-flow from day 1
- Ready to share savings with ESCO
- Long-term commitment from ESCO

Energy Performance Contract (ESPC) – GUARANTEED SAVINGS



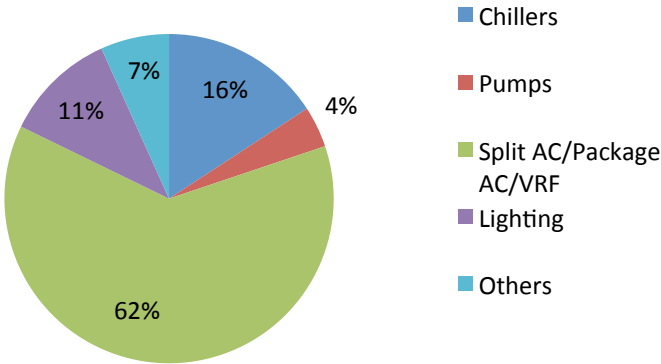
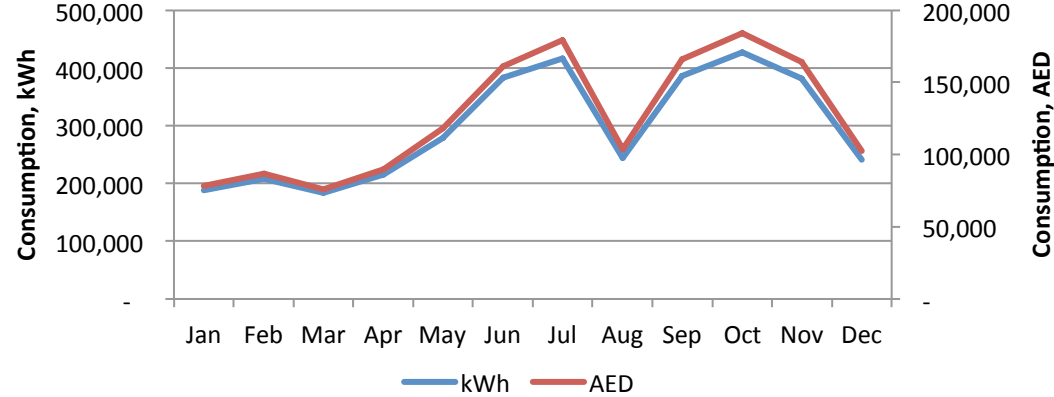
Energy Performance Contract (ESPC) – SHARED SAVINGS



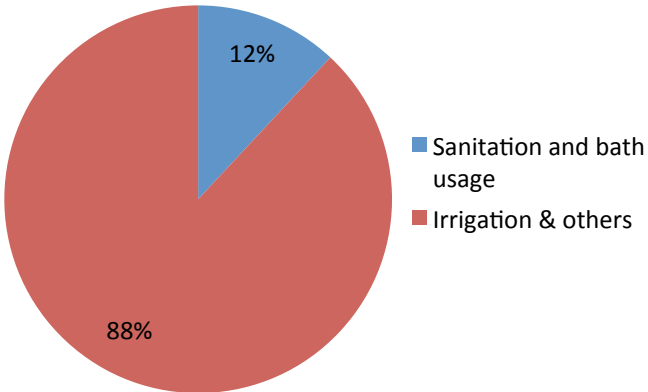
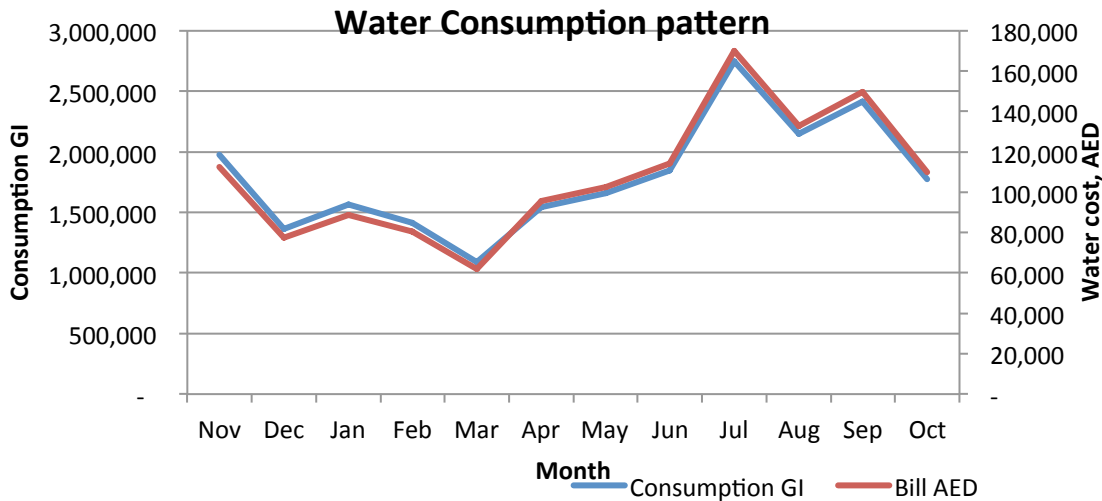
Shared Savings Project: Our school, located in Dubai, houses about 900 students and spends 2.8 mil AED on electricity water annually

Energy performance index: 192 kWh/m2/yr

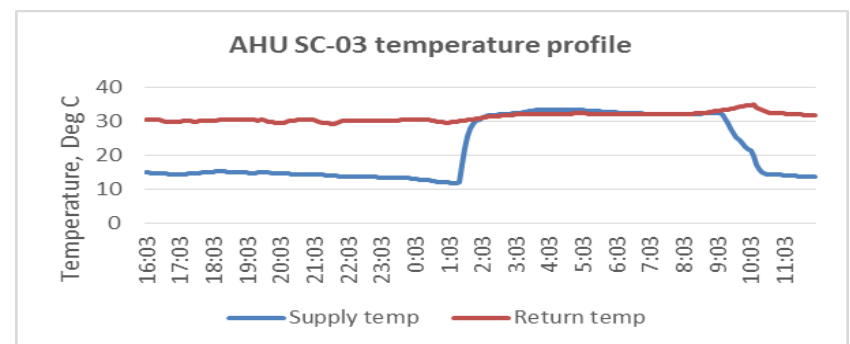
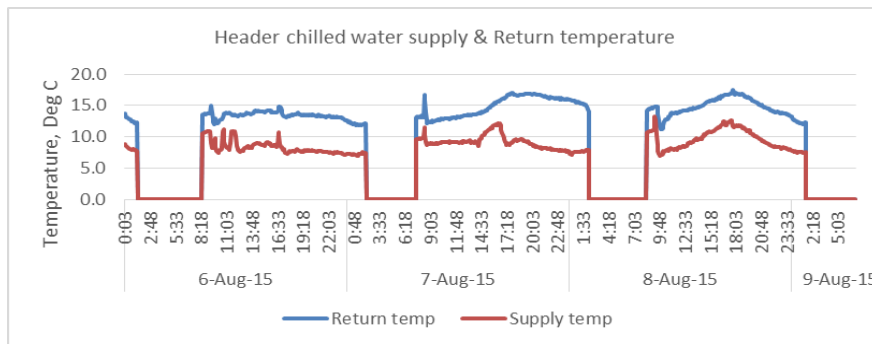
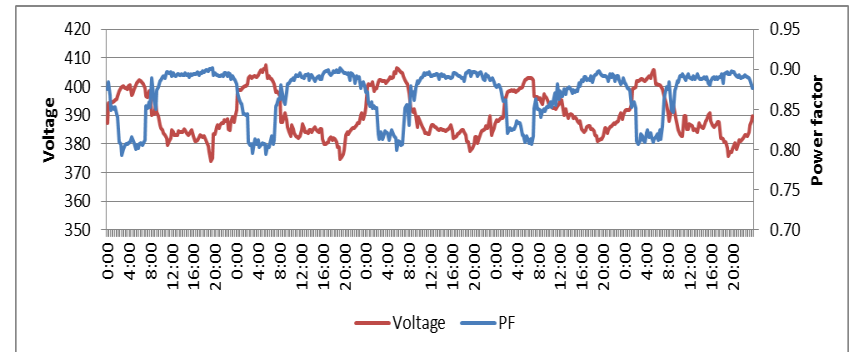
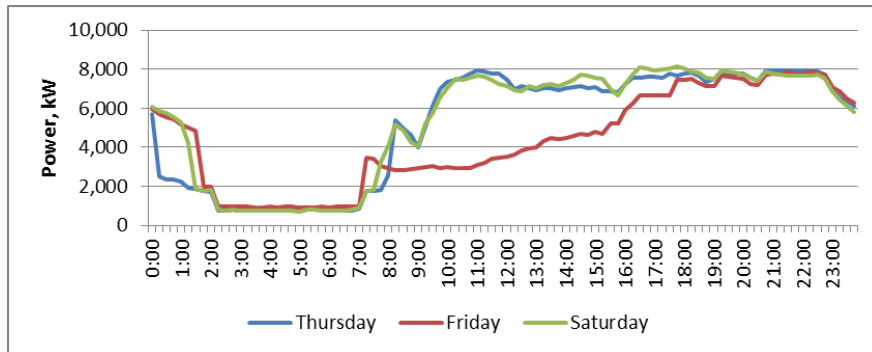
Electricity Consumption pattern



82% of electricity bill is due to Air Conditioning



Through measurements, we identified opportunities to improve energy efficiency and reduce school's overall energy consumption



After conducting energy audit, S4P identified energy & water saving measures that will reduce the energy bill by almost 30% (0.7 million AED yr)

Description		Energy, kWh/IMG	Cost savings, AED	Budgetary Investment, AED	Payback period, Years
HVAC control- Chiller+Pumps+ AHU/FAHU	Conser	124,725	54,879	206,250	3.76
Achievable savings: 15-25%	Best	207,875	91,465	185,625	2.03
Wet wall system for chillers	Conser	60,000	26,400	120,000	4.55
Achievable savings: 8-12%	Best	72,000	31,680	110,000	3.47
DX unit retrofit installation	Conser	172,133	75,738	142,200	1.88
Achievable savings: 10-15%	Best	258,199	113,608	127,980	1.13
DX unit control system	Conser	159,706	70,271	190,000	2.70
Achievable savings: 5-10%	Best	239,559	105,406	161,500	1.53
Lighting replacement	Conser	196,853	103,938	542,980	5.22
Achievable savings: 50-65%	Best	255,908	135,120	461,533	3.42
Soil additives	Conser	6,069,147	315,596	701,813	2.22
Achievable savings: 40-50%	Best	7,586,433	394,495	631,631	1.60
Water faucet retrofit	Conser	205,700	10,696	15,000	1.40
Achievable savings: 20-30%	Best	308,550	16,045	13,500	0.84

The customer decided to engage S4P for the implementation under shared-savings performance contract

		Guaranteed savings scheme (Investment by Client)		Shared-saving scheme (Investment by S4P)	
Years	Energy Savings Target (AED)	Client Shared Savings (%)	Client Net Cash Flow (AED)	Client Shared Savings (%)	Client Net Cash Flow (AED)
Year 0		0%	(1,655,000)	0%	-
Year 1	737,412	100%	737,412	15%	110,612
Year 2	766,908	100%	766,908	15%	115,036
Year 3	797,585	100%	797,585	30%	239,275
Year 4	829,488	100%	829,488	30%	248,846
Year 5	862,668	100%	862,668	45%	388,200
Year 6	897,174	100%	897,174	45%	403,729
Total Yrs	4,891,236		3,236,236		1,505,699

Guaranteed Savings Project: Comprised implementation of Energy Conservation Measures at DIA & RWA (Innoventures Group)

School Profile



- Total built-up area of 21,097sq.
- 2,000 students
- Annual consumption: 4.5 million kWh
- Annual electricity cost: 1.98 million AED

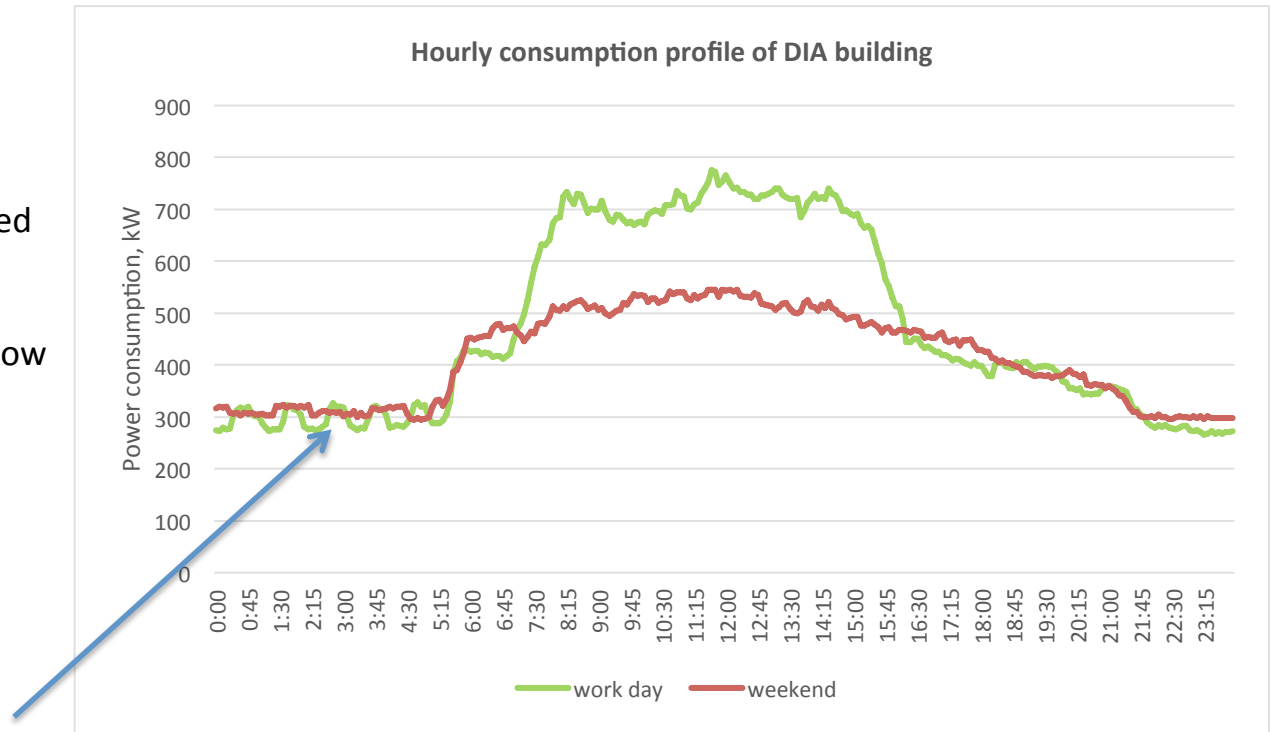
School Profile



- Total built-up area of 18,120sq.
- 1,400 students
- Annual consumption: 3.7 million kWh
- Annual electricity cost: 1.5 million AED

During the energy audit, we were able to spot the major opportunities for energy savings

- Chillers and pumps were operated for 24 hours
- Constant flow chilled water circuit and 3way valves installed in the building' side
- Chillers are operating at very low Delta T
-



constant load of 300 kWh at night

... and identify the most cost-effective energy savings solutions

Energy Savings measures description	Electricity savings		Budgetary investment	Pay back period	% savings on
	kWh	AED	AED	Years	utility
Installation of Chiller plant manager	1,138,697	487,536			24.6%
FAHU/AHU/FCU scheduling	170,291	74,928			3.8%
Installation of evaporative cooling system - chiller	151,686	66,742			3.4%
Installation of control device to DX unit	42,866	18,801			1.0%
Swimming pool heat pump scheduling	45,014	19,806			1.0%
Sub-total	1,548,554	667,873	1,016,700	1.52	34%
Other ECMs					
Chiller & FAHU heat recovery wheel maintenance	85,751	37,731			2%
Grand total	1,634,305	705,604	1,076,700	1.53	36%

Smart4Power has guaranteed annual savings of 23% through the implementation of proposed ECMs

The investment on the proposed energy conservation measures will be paid back in just 2.3 years

All Energy Conservation Measures

Cost Savings Summary:

791,000 AED / year

Budgetary Investment Summary:

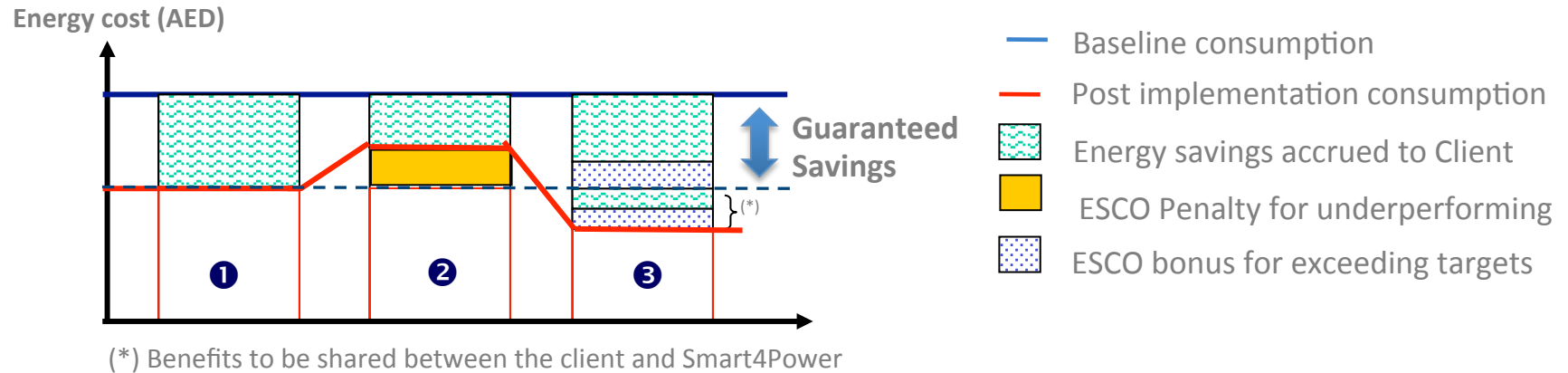
1.8 million AED

Payback Period , Years Summary:

2.3 years

Under the GUARANTEED SAVINGS, Smart4Power contractually guaranteed a minimum ROI to the client

Client is ensured minimum savings and long-term commitment from ESCO

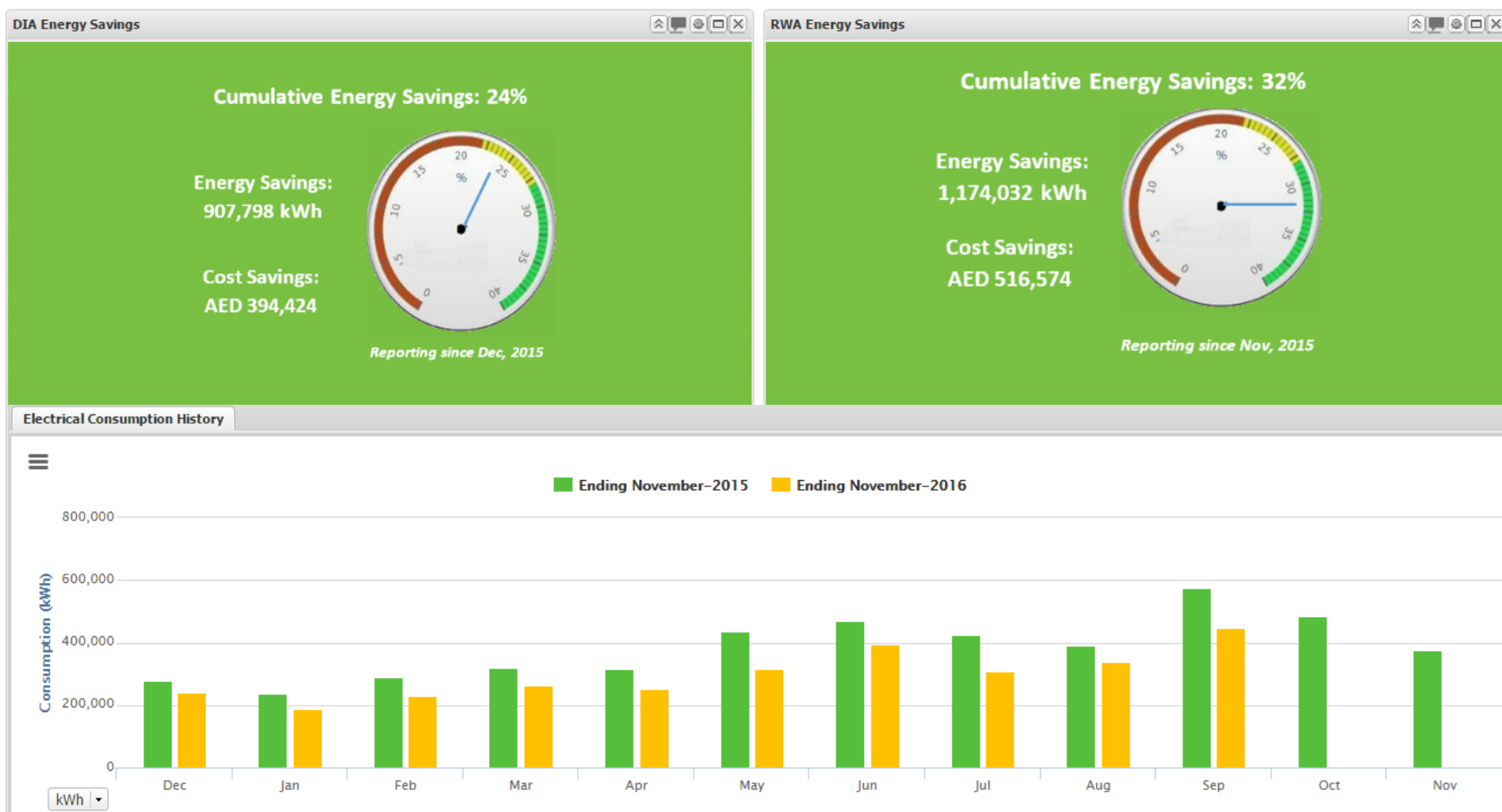


① ACTUAL COST = TARGET COST

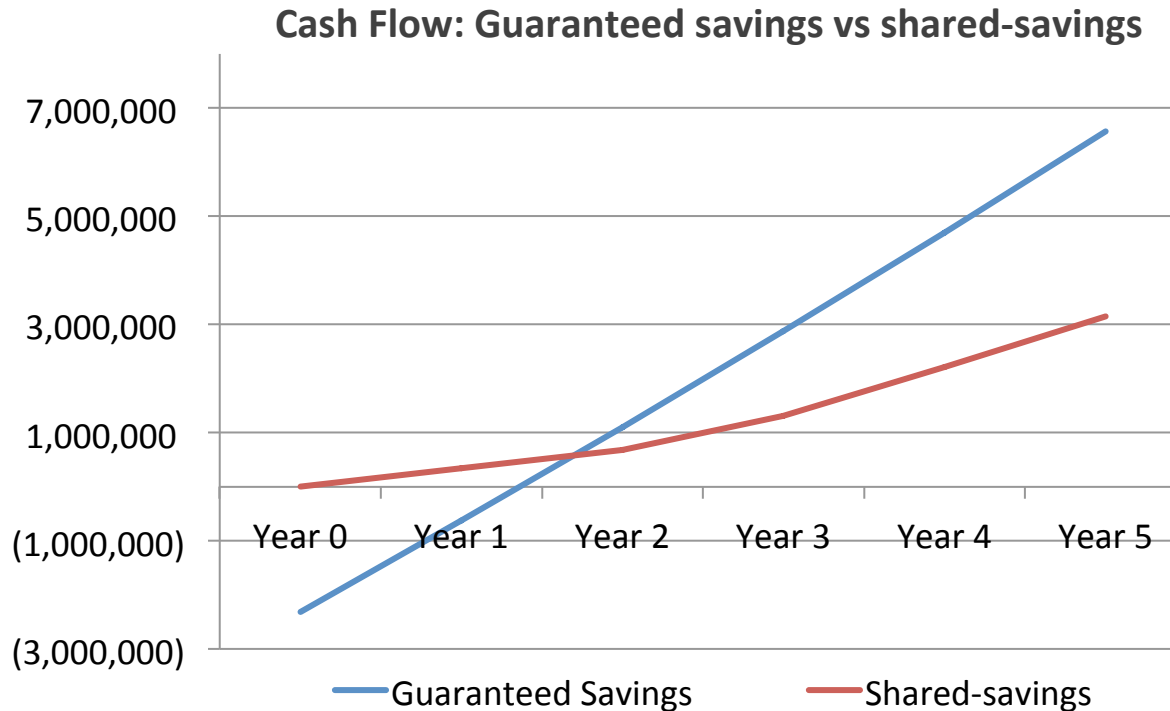
② ACTUAL COST > TARGET COST

③ ACTUAL COST < TARGET COST

Net savings achieved exceeded 0.9 million AED after only 10 months



Shared Savings vs. Guaranteed Savings?? The question is not about the savings but the financial model that best suits our customers



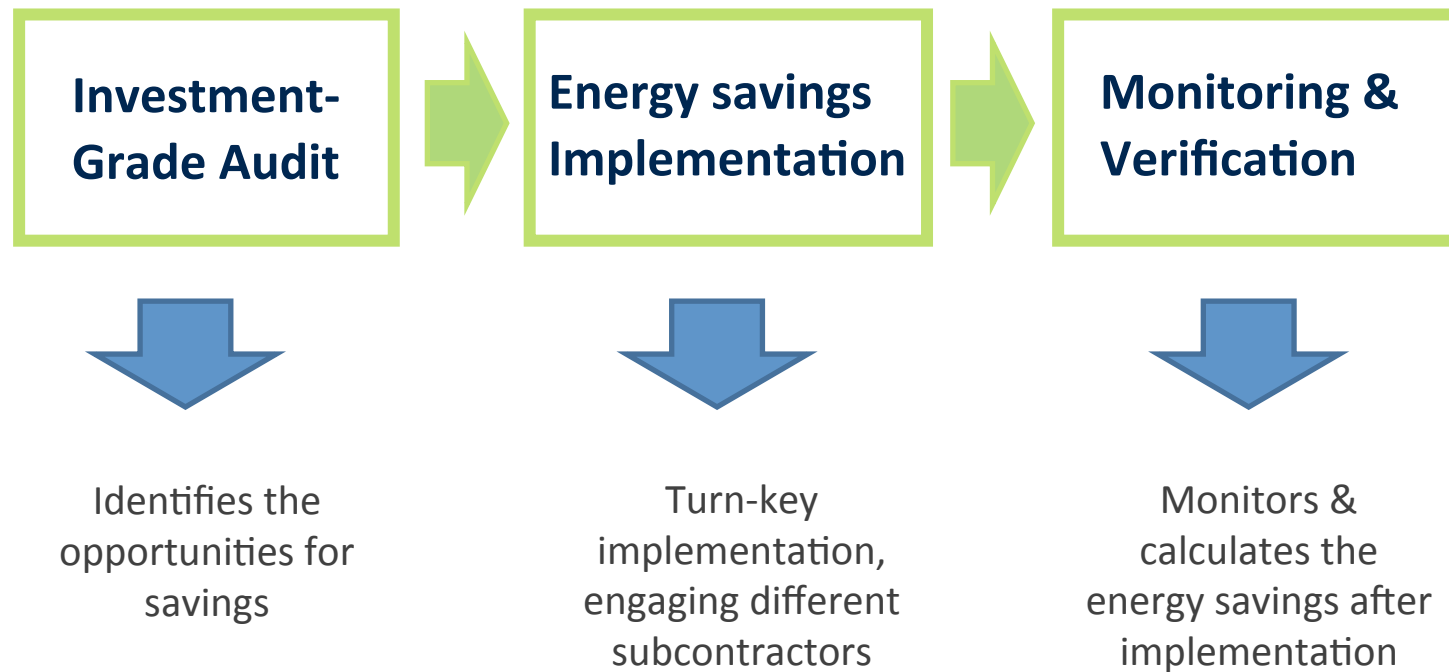
Figures based on following conditions:

- Baseline annual consumption: AED 8.2 million
- Annual savings: 21% (AED 1.7 million)
- Energy conservation measures capex: AED 2.3 million

Four Key Success Factors for Energy Performance Contracting Projects

- **Investment-grade audit:** identifies the most cost-effective ECMs and sets the basis for minimum guaranteed savings/ROI
- **Energy Savings Performance Contract, including M&V,** defines clear terms for the implementation of solutions and calculation of savings
- **Remote monitoring & control of building consumption,** ensures proactive management of savings
- **Client creditworthiness / ESCO EE expertise & contracting capabilities,** along with stable environment and collaborative approach between the parties

Recommended Steps for Contracting Energy Performance Projects





Company Profile

Who We Are

Smart4Power is an independent provider of energy savings services & solutions for existing buildings

Smart4Power By the Numbers (2015)

+110

Energy Audits Completed

+40

Energy Efficiency Projects Implemented

14,5 million

Annual Energy Cost Savings Achieved (AED)

18,000

Annual CO₂ Emissions Reductions Achieved (tons)

Regional Presence



Accreditations



Clean Energy Business Council



مكتب التنظيم والرقابة لقطاع الكهرباء و المياه
RSB FOR ELECTRICITY & WATER

Energy Auditor & ESCO accredited

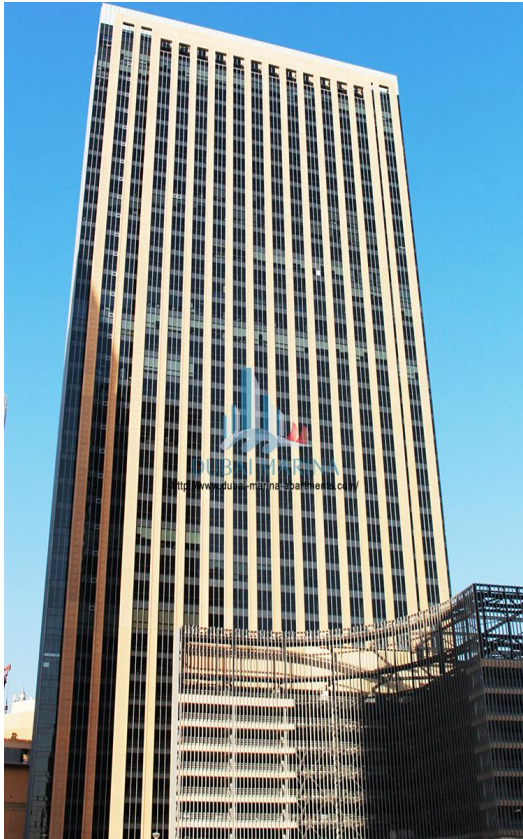
S4P International Team

- HVAC Engineers
- Controls Engineers
- Lighting specialist
- Energy Auditors
- Project Managers



Who We Are

Smart4Power became part of ALEC in 2014



- ALEC is one of the largest and respected contractors in the region.
- Turnover to over USD 1 billion annually.
- Related business: MEP, Fit-out, Solar, Precast, FM... Energy Efficiency

Diversified Business



Our Clients

We have a strong base of trusted and loyal clients across the UAE



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