Accessing Funding for Lighting and HVAC Retrofits Projects

Ark Energy | Energy Efficiency Advisory Services

14 July 2021
Version 1
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Agenda

1. Energy Efficiency Perspective
2. Funding Models
3. Project Development Approach
4. About Ark Energy
AREF ABOUZAHR  MBA, P'Eng, PMP, CEM, CMVP, PCF
Chief Executive Officer

Energy, Water, and Utilities expert with 23 years of North American and GCC experience in management and project development consulting, new business setup, and strategic program design and PMO implementation within conventional and renewable energy, Demand Side Management and Energy Efficiency sectors. At Ark Energy, Aref is focused on Energy Transition program design and implementation PMO, Energy Efficiency and distributed Solar projects development and financing, Energy Efficiency policy design, and digitalization of energy management information systems (EMIS). He heads Ark’s business in globally, focusing on GCC and Africa.

HIGHLIGHTS

Founder and Executive Director of TAQATI, the dedicated Program Management Office mandated by Dubai Supreme Council of Energy to implement the Demand Side Management Strategy of Dubai and attain its energy efficiency targets (Dubai, UAE)
Principal at Ernst and Young – Power and Utilities Advisory Services (Dubai, UAE)
Head of Infrastructure and Utilities at General Secretariat of the Executive Council (Abu Dhabi, UAE)
Global Market Program Leader of Alternative Energy at General Electric - Power and Water (NY, USA)

Key executive management and senior advisory roles within the public and private sectors at General Electric (Power and Water), A.T Kearney, ITT (Water and Wastewater)

EDUCATION

Masters in Business Administration
University of Texas

Post-MBA, McGill Canada

Bachelor of Engineering
American University of Beirut (AUB)

LANGUAGES (Spoken & Written)

English (fluent), Arabic (native) and French (advanced)

RELEVANT PROJECTS

<table>
<thead>
<tr>
<th>Project</th>
<th>Typical Project Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dubai DSM Strategy 2030</td>
<td>Project Partner: Identify, qualify and create project opportunities, support clients to get the buy-in for, develop, fund and execute building retrofits, delta-t rehabilitation and solar projects, manage the relationship with the C-level client with project oversight, QA/QC and complex technical, commercial and legal consulting</td>
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<tr>
<td>DCPs (1, 3, 4, 5, 6 and 11)</td>
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<tr>
<td>Index Tower</td>
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<td>Al Seef Tower</td>
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<td>EREIT building portfolio in Dubai</td>
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<td>Sheraton Jumeirah Beach Hotel</td>
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<td>Al Ain Mall, Abu Dhabi</td>
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<tr>
<td>Sol Star Building</td>
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</tbody>
</table>

Note: Refer to section 6 (Relevant Case References) in our technical proposal for more information on each project
Section 1
Energy Efficiency Perspective
Net Operating Income as a strategic priority

While there is focus on decarbonization, Net Operating Income remains to be a critical KPI and is under tremendous pressure with rising O&M costs and decreasing revenue.

To preserve its Net Operating Income, businesses must cut costs or increase revenue.

... but these metrics are under tremendous pressure with rising labor and O&M costs, reducing traffic and increasing competition.

Utilities constitute 15 - 30% of total O&M costs in most businesses and are hence a primary target for cost-cutting initiatives.

Net Operating Income

Reduce Costs

- Protect Revenue
- Quick short-term fixes
- Individual OpEx improvement measures
- Integrated sustainable measures

Utilities

- Utility Bills
- Cost of Diesel/Gas
- Cost of Labor
- Competition (existing/future)
- Customer traffic and spend

O&M costs

- Others 70%
- Utilities 15%
- Electricity & District Cooling 60%
- Water 30%
- Gas/LPG 10%

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Energy End-Use Analysis

Cooling and Lighting contribute 66% of energy end-uses in a typical commercial building (hot and humid climates)

Typical Energy Load Split (Commercial Building)\(^{(1)}\)

- CW Plant Opt & dT: 54%
- FAHU Measures: 14%
- AHU Measures: 6%
- Energy Management Control System: 7%
- FCU Thermostat Setback: 5%
- Lighting Retrofit: 12%
- Pumps (CW Optimization + Heat Pumps): 6%
- Other: 2%

\(^{(1)}\) Source: Ark Energy team analysis based on Dubai Energy Efficiency Strategy (2019). Number may change based on the energy mix.
Energy Transition: Energy Efficiency

Energy Efficiency Retrofit cuts down utility costs, enhances asset lifecycle, improves standards of comfort and reduces your carbon footprint with a 2 to 3-year average payback time.

Lowers utility costs and enhances equipment lifecycle with sustainable and integrated energy conservation measures

... and improves standards of comfort across different key areas of the building

... and decarbonizes your operations

Focus of the document

- Efficient and Smart Lighting
- Upgrade of HVAC Systems and Reduction of Cooling Load Requirements
- Power Quality and Harmonics Improvement, and Enhanced Equipment Lifecycle
- Upgrade of Building Envelope
- Digitalization of Energy Operations and Building Automation Systems
- Efficient Indoor and Outdoor Water Systems
- Delta-T Rehabilitation

Translates to 20 - 50% Lower Utility Bill

Notes: CO2 – MWh conversion is based on Dubai Energy Efficiency Strategy (2019). Number may change based on the energy mix.
Corporate Challenges

市场调查中的1900位受访者得出的结论如下：

Constrained resource bandwidth or capacity, and lack of focused project ownership (52%)

Lack of relevant technical or legal knowledge or capability within the client’s procurement, contracts, engineering or maintenance team (60%)

Lack of available capital to spend on non-core projects due to depleted cash reserves or lack of access to investors/financiers (72%)

Low client awareness, and confidence in energy efficiency and optimization projects (38%)

Project-related Challenges

- Stakeholders
  - Internal stakeholders’ buy-in (Ops, legal, finance, proc)
  - Project ownership
  - Source of funding

- Legal
  - Performance contracting model: Shared or Guaranteed
  - Safe-guarding Client’s investment
  - Duration, terms and standards of comfort
  - Roles & responsibilities of ESCO vs. Client’s O&M team

- Commercial
  - Business case assessment
  - Share split between ESCO and Client
  - Measures to reduce cost of financing and project risk
  - Exit (termination) terms
  - Performance assurance and savings guarantees

- Technical
  - ESCO selection
  - Technical feasibility assessment
  - Site-relevant specifications and applicable standards
  - Detailed engineering and design optimization
  - Construction supervision and functional tests
  - Pre-commissioning and commissioning tests
Section 2

Funding Models
Funding Options

Capital allocation and risk appetite drive decision-making to select the most suitable funding mechanism

Financing Options

Self-Funded

Capital Reserves

Loans

3rd Party Financing

Energy-as-a-Service (EaaS)
Shared Savings
Energy Performance Contracting

Cooling-as-a-Service (CaaS)
B1. Traditional CaaS
B2. CaaS with BTU

Highlights

• Working capital depletion
• NPV and IRR driven selection process
• Board decision

• Bonds
• Collateral
• Corporate guarantees
• On Balance sheet

• 3rd party investor
• Off Balance sheet
• OpEx, not CapEx
• Savings guarantee

• 3rd party investor
• Payments are agreed upon as a function of actual usage
• OpEx, not CapEx
EaaS with Energy Savings Performance Contracting (ESPC) Models

Funding mechanism selection then drives the energy savings performance contracting model

1. Shared Savings ESPC Model

- Payment for services
- Engineering, Financing, Implementation, O&M and M&E
- SSEPC and Repayment through savings share split

**Highlights**
- Investor puts 100% of CapEx or Co-Invests
- Savings are shared
- Investment paid back based on performance
- Aligned-interest partnership
- Off the books
- Long-term agreement (5 to 8 years)

2. Guaranteed Savings ESPC Model

- Funds (if applicable)
- Payment for services
- Engineering, Implementation, O&M and M&E
- Savings Guarantee

**Highlights**
- 100% Investment sourced by Client
- Savings are 100% to client
- Savings are guaranteed by the ESCO (with contractual limitations)
- Agreement is at the client’s discretion

3. Non-ESPC Model (e.g., Design-Build-Operate)

- Funds (if applicable)
- Repayment based on the agreement
- Engineering and Implementation

**Highlights**
- 100% Investment by Client (or thru loan)
- Savings are 100% to client
- Not savings guarantee
- ESCO may stay for operational period
A funding mechanism with On-Bill payment can significantly reduce cash flow risk for the investor, and increase adoption by eliminating financial roadblocks for end-user.

**Financial Institution**

- Eliminate Delta-T (penalties)
- Upgrade in Control
- Upgrade in Equipment
- Increase in Comfort Level
- Guarantee Savings

**ESCO/Solar EPC**

- Delta T elimination Retrofit Work
- Savings Guarantee

**Utility (Guarantor)**

- Audit & Consulting
- Legal Agreement development
- Project Management
- M&V of Savings
- Upgrade Control
- Retrofit Existing Equipment
- Equipment upgrade or replacement

A1 Financing with On-Bill Payment Business Model

A funding mechanism with On-Bill payment can significantly reduce cash flow risk for the investor, and increase adoption by eliminating financial roadblocks for end-user.
Crowd Funding for Energy Performance Contracting

Crowd funding can be an effective tool to deploy in buildings, where the residents can participate in a fund that can invest in a Shared Savings Energy Performance Contract

Simplified contracting structure

The Host enters into an energy services agreement (ESA) with the Special Purpose Vehicle (SPV) - which funds and implements the energy efficiency project - in return for a service charge.

The SPV sub-contracts implementation to an energy service company (ESCO) through an energy performance contract (EPC), financed by The Fund.

The EPC typically incorporates a Performance Guarantee and ongoing Operations & Maintenance (O&M) services. Other EPC terms are designed back-to-back with the ESA, leaving the SPV with the obligation to fund the project and the ESCO the obligation to deliver the project.

The Host has the right to terminate the ESA at any time after implementation for the present value of the future cash flow streams (termination value).

Ark Energy anticipates that such projects would qualify for off balance sheet treatment (for the Host).

Source: Ark Energy (2020)
In the traditional CaaS model, Client turns CapEx into OpEx with predictable costs, while off-loading all service obligations onto the Service Provider.

**CaaS Service Provider** (e.g. ESCO or technology provider)

- Turn CapEx into OpEx
- Eliminate chiller plant maintenance (extendible to HVAC network)
- Higher standards of comfort
- Lower service charges (buildings)
- Predictable OpEx costs

**OEM** (Cooling Technology)

- Take over aging cooling equipment from the client
- Provide optimum maintenance through their service contracts (AMC) with OEM
- Install metering infrastructure to measure electricity consumption on the chiller plant
With BTU Submetering model integrated with CaaS, Client off-loads CaaS payments onto the BTU SSP, and chiller plant / HVAC network upkeep onto the CaaS service provider.

- Turn CapEx into OpEx
- Eliminate chiller plant maintenance (extendible to HVAC network)
- Higher standards of comfort
- Lower service charges (buildings)
- Predictable OpEx costs

- Take over aging cooling equipment from the client
- Provide optimum maintenance through their service contracts (AMC) with OEM
- Install metering infrastructure to measure electricity consumption on the chiller plant
Case Study 1: Industrial Application in Dubai of SSEPC

Energy Efficiency Retrofit including chiller swap, SCADA implementation, and O&M digitalization scope fully funded by an investor under an 8-year Shared Savings Energy Performance Contract

**Project Background**

- **District Cooling Plant (Dubai, UAE)**
- **Total Cooling Capacity:** 5,450 Tons (TR)

**Energy Costs (pre-retrofit, 2020)**

- **Electricity:** 84.3%
- **Water:** 15.2%
- **Solar:** 0.4%

**Total Utility Costs:** US$ 1.46 mil

**Client Challenges**

- Plant process equipment continuously running on manual mode with no digital energy monitoring or automated fault detection
- Equipment and instrumentation in bad conditions with high harmonic issues
- Energy costs much higher than benchmarked peers
- O&M costs increasing constantly

**High-level Approach**

- **Business Case**
- **Tendering**
- **Contracts**
- **Energy Audit**
- **Implementation**
- **M&V Reporting**

**Project Financing**

- **8-year Shared Savings Energy Performance Contract**
- **… savings split of**

<table>
<thead>
<tr>
<th>Client</th>
<th>Investor</th>
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<tbody>
<tr>
<td>37%</td>
<td>63%</td>
</tr>
</tbody>
</table>

**Project Outcome**

- **US$ 337k**
  - Annual Savings
- **21% reduction**
  - in Energy Consumption
- **4.0 years**
  - Project payback time
- **1,158 Tons/yr.**
  - Avoided CO₂ emissions
- **Digitalization of energy management (arkEMIS) with AI-enabled asset management**
- **New downstream chiller with a new cooling tower**
10-year profit of US$ 1.14 mil from savings, along with equipment enhancement and operational modernization, and repayment through sharing the savings that significantly de-risk the project.

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**EMICOOL Gross Energy Cost Savings**
*(2021-2031 estimated, Shared Savings, ‘000s of USD)*

- **Client:** 100%
- **Investor:** 0%

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**EMICOOL Net Cashflow**
*(2021-2031 estimated, Shared Savings, ‘000s of AED)*

- **Client:** 309, 62, 62, 62, 31, 31, 31, 15, 279, 265, 1,145
- **Investor:** 0, 0, 4, 5, 6, 7, 8, 9, 10, 10-year

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Case Study 2: Iconic Multi-Use (Commercial and Residential) Building in Dubai

Energy Efficiency Retrofit with lighting retrofit, delta-T rehabilitation, and O&M digitalization scope fully funded by an investor under a 7-year Shared Savings Energy Performance Contract

### Annual Utility Cost Savings

- **Pre-Retrofit:** 5,500
- **Energy Savings:** 1,092
- **Post-retrofit:** 4,408

(1) Does not include any Equipment or Asset O&M costs or resulting savings from the Building Retrofit project

### Summary Project Outcome

- **Savings:** 28% (US$ 1.1Mil)
  - Annual Reduction in energy (kWh) consumption versus baseline
- **CapEx:** US$ 2.75 Mil
  - Initial Capital Investment

### Project Payback Time

2.5 years

### Energy Efficiency Measures

- Chilled Water Plant Optimization
- Efficient lighting / lighting controls
- Pool Hot Water Heat Pump
- FAHU Demand Controlled Ventilation and FCU Thermostat Setback
- FAHU Supply Air Temperature Reset
- Common Area Temperature Management
- AHU Supply Fan Static Pressure and Air Temperature Reset
- BMS and Controls Upgrade
- Energy Control Management System

Source: Financed Shared Savings Energy & Delta-T proposal (Nov 2017)
Relatively higher savings split between the investor and Client given the faster payback of the project, with the Client clearing up a net profit of US$ 5.6 mil over 10 years.

**Client Gross Energy Cost Savings**
*(2021-2031 estimated, Co-Investment, ‘000s of USD)*

**Client Net Cashflow**
*(2021-2031 estimated, Co-Investment, ‘000s of USD)*
Section 3

Project Development Approach
Energy Efficiency (Building Retrofits) Project Development Approach

Following a comprehensive approach can help reduce building retrofit project costs, maximize energy reduction, and address every critical issue the asset has.

**High-Level Approach**

1. Business Case, and Asset Prioritization
2. Site Survey, and Pre-tendering Preps
3. Tendering, and Contract Execution
4. Energy Audit, and M&V Plan Due Diligence
5. Implementation Supervision
6. M&V Reporting, and Digitalization of EM

**Target Setting**

The results of the Walk-Thru Audit and Delta-T Assessment can determine the energy savings target that will be requested from the market upon launching the retrofit and Delta-T rehabilitation project.

**Decision Making drivers**

Two prevailing questions were captured from our discussion with Client:

1. *Can the Client verify the savings before we proceed with the project?*
2. *Which funding model should we undertake: self-fund, 3rd-party fund or hybrid, and when can the Client take a decision on funding model?*
Funding Model Selection for Energy Efficiency (Retrofit) Projects

Carrying out a comprehensive due diligence on the ESCO/Investor’s funding proposals is critical to select a funding option that fits the organization’s risk appetite and cash position

Selecting the right funding model has always been a major challenge since different vendors propose different solutions and under different terms (tenure, payment terms, savings, conservation measures etc.). We have developed and perfected our cashflow models that integrate all the financial proposal data from all vendors to ensure that we level the playfield and compare likes for likes, alleviating interpretation risks and turning the exercise of selecting the right funding model into a purely quantitative one

<table>
<thead>
<tr>
<th>Financial Submissions We Request</th>
<th>Financial KPIs We Investigate</th>
<th>Prevailing Questions We Answer (non-exhaustive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Energy Performance Savings Contract models</td>
<td>Total forecasted annual savings</td>
<td>What is the best funding option and what are the payment guarantees that can reduce financing cost?</td>
</tr>
<tr>
<td>Tenure of each ESPC contract model proposed</td>
<td>Customer share of annual savings</td>
<td>What is the breakdown of proposed solution pricing, fees, and other costs (normally not provided by ESCO in shared savings contract)?</td>
</tr>
<tr>
<td>Proposed Energy Conservation Measures along with their forecasted savings and CapEx, and payback time</td>
<td>Total customer profit</td>
<td>Are there permissible circumstances to extend contract term, or is the customer’s cost share sufficient to preclude any need for modification?</td>
</tr>
<tr>
<td>ESPC models outcome summary</td>
<td>Customer initial investment (CapEx)</td>
<td>How do we define and operationalize the achievement of contracted savings, e.g., are determinations and payments made monthly, quarterly, or yearly?</td>
</tr>
<tr>
<td>Cost breakdown details of ESPC models</td>
<td>Customer operational costs (Opex)</td>
<td>What happens if savings fall short of threshold for some periods, but are offset by savings in later periods? When does reconciliation occur?</td>
</tr>
<tr>
<td>Total project value</td>
<td>Total project value</td>
<td>How much time does ESCO have to remedy shortfalls in savings, if encountered, before non-payment is determined to be permanent for a given year, or an event of default is triggered?</td>
</tr>
<tr>
<td>Maintenance activities and costs</td>
<td>Net present value (NPV)</td>
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<tr>
<td>O&amp;M savings per ECM</td>
<td>Return on Investment (ROI)</td>
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<tr>
<td>Proposed cashflow per ESPC model</td>
<td>Internal rate of return (IRR)</td>
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<td></td>
<td>Project payback time</td>
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<td></td>
<td>Savings degradation after reporting period</td>
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</table>
Awarded ESCOs are required by contract to report energy savings as per an M&V Plan that Ark Energy assesses and approves. While the M&V plan will rely on IPMVP as the global protocol for measurement and verification of energy savings, auditing energy savings reporting is an essential business requirement, especially in the case of contractual obligations such as savings incentives.

Key Drivers for M&V Reporting Period Issues

- Lack of technical knowledge of the M&V formulas and regression modeling methodology used to create them
- Lack of ownership of the M&V reports
- Lack of experience in assessing the adjusted baseline (core of the IPMVP protocol), static factors, routine or non-routine adjustments
- Lack of capability to identify discrepancies or engage the ESCO in a rational dispute on energy savings
- (at times) Lack of proper M&V reporting (incomplete dashboard)

Disputes may arise during the reporting period that can result in litigations and disruption of Energy Management Services

Mitigating Risks during the M&V Plan Development phase

- Select the right M&V Option depending on the retrofit plan
- Utilize our proprietary M&V model to develop adjusted baseline regressions
- Identify and validate independent variables to minimize model uncertainty
- Capture independent variables datasets from trusted market sources
- Back-test the M&V model using historical data
- Assess static factors and quantify their impact

Mitigating Risks during M&V Reporting Period

- Monthly Energy Savings report evaluation
- Quarterly Energy Savings Audit
- Annual Energy Savings Audit
- Digitalized Measurement and Verification of savings with automated reporting (arkEMIS)
Section 4

About Ark Energy
Facilitating Energy Transition

Ark Energy is a specialized boutique advisory firm that consults private and public sector clients to transition into low-carbon, smart and efficient energy systems through 7 niche services

<table>
<thead>
<tr>
<th>Energy Transition Services</th>
<th>1. Energy Transition Strategy Design and PMO</th>
<th>2. Energy Efficiency (Building Retrofit) Project Development Consulting and Execution Management</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Design and implement executable Energy Transition strategies including Demand Side Management (DSM) and Renewable Energy Strategy (RESF) with savings targets (net zero) and implementation roadmap, Program Management Office setup and implementation, and monitoring and evaluation of programs based on up-to-date technologies, standards and best practices. Challenge existing energy services business models, develop and roll-out new energy services business units, and re-design their customer experience / customer journey with UXUI integration.</td>
<td>Take the headache away from our clients and provide them with turn-key advisory &amp; project development services as Owner’s Consultant using proprietary methodology suite of tools (technical, commercial, legal and project management) to execute and fund their Energy Retrofit projects.</td>
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<td></td>
<td>Integrate our state-of-the-art, easy-to-access, cloud-based digital Energy Management Information System platform (arkEMIS) to provide AI-enabled energy data analytics, visualization, automated reporting, drifting and fault detection</td>
<td>Take the headache away from our clients and provide them with turn-key advisory &amp; project development services as Owner’s Consultant using proprietary methodology suite of tools (technical, commercial, legal and project management) to execute and fund distributed Solar projects.</td>
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<td>5. Delta-T Rehabilitation Assessment and Execution Management</td>
<td>6. Thermal Cooling Load Assessment</td>
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<td></td>
<td>Carry out highly specialized assessment to analyze root causes behind Low Delta-T syndrome, provide and validate a rehabilitation roadmap, source funding, and manage its execution</td>
<td>Conduct cooling load assessment using exhaustive and calibrated energy modeling (IES VES) and Building Information Modeling (BIM) to accurately estimate declared load from DC operators or chiller plant, and cooling energy distribution</td>
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<td></td>
<td>7. Building Recommissioning and BTU Submetering</td>
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<td></td>
<td>Carry out building recommissioning or retro-commissioning for existing building stock, Project manage BTU submetering infrastructure funding and roll-out</td>
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</table>
Project Development Consulting Business Model

We have developed a unique overarching business model dedicated to take away the headache from our clients throughout the project lifecycle, acting as an independent Owner’s Consultant

Deliverable Highlights

- **Assess the business case** for an energy retrofit or solar rooftop
- **Act as project manager / owner’s representative** to manage the tendering, contracting, execution and commissioning process
- **Facilitate 3rd party financing** based on project viability and client’s bankability
- **Short-list qualified service providers and investors**, in line with Client’s constraints, bandwidth, capability, procedures and investment appetite
- **Provide legal support** to draft and execute Audit Development Agreements, Energy Savings Performance Contracts and Solar Leasing agreement that governs the relationship with the service providers for the duration of the contract
- **Provide in-depth commercial and technical expertise** to thoroughly check and approve the detailed energy audit (IGA), method statements, implementation plans, detailed design drawings and material submittals to alleviate design and implementation risks
- Integrate and provide client access to state-of-the-art and independent digital energy management system (arkEMIS) with artificial intelligence-enabled asset management platform and comprehensive suite of data analytics modules
- **Act as 3rd party savings measurement and verification auditor to safe-guard** Client’s savings for duration of energy savings performance or solar leasing contract
# Client Experience and Competitive Advantage

For over 23 years, we have advised high-profile clients to develop and execute ambitious Energy Transition programs from strategy to implementation with active monitoring and evaluation.

## Our Competitive Advantage

**Strong credentials** and long-term relationships with high-profile public and private sector clients

**Over 23 years of energy strategy consulting experience** and implementation PMO with flagship projects incl. design, setup and program management of Dubai Energy Efficiency Strategy (TAQATI)

**End-to-end expertise** with proprietary methodologies and tools to develop and execute **Energy Retrofit and Solar projects** incl. technical, commercial and contractual advisory services as **Client’s internal project manager / consultant**

**Track record of value-creation** with project cost savings of up to 35%, and energy savings increase of 20% vs. initial vendor proposals

**Strong track record in digitalization transformation of energy management** with our AI-enabled energy management information system (arkEMIS)

**Vendor and technology agnostic** with open-market approach to secure funding

**Structured management consulting** approach to facilitate C-level decision buy-in

**In-depth benchmarking** and industry outreach

## Selected Clients

<table>
<thead>
<tr>
<th>Selected Clients</th>
<th>OEMs</th>
<th>Government</th>
<th>International Org.</th>
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<tbody>
<tr>
<td><strong>OEMs</strong></td>
<td>Siemens</td>
<td>GRUNDFOS</td>
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<td><strong>Healthcare</strong></td>
<td>RASHID HOSPITAL</td>
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<tr>
<td><strong>Industrial</strong></td>
<td>National Food Products Company</td>
<td></td>
<td>International Finance Corporation</td>
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<tr>
<td><strong>Commercial &amp; Residential</strong></td>
<td>three60</td>
<td>Dubai Holding</td>
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</table>
For clarifications or questions, please contact:

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E: aref@arkenergy.ae
**Market Outlook for ESPC Contracts**

Shared Savings Energy Performance Contracting is projected to be the fastest growing funding model in Dubai for the next 10 years.

**Energy Performance Contracting Market**

<table>
<thead>
<tr>
<th>Year</th>
<th>Guaranteed Savings EPC</th>
<th>Shared Savings EPC</th>
<th>Non-EPC</th>
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<tbody>
<tr>
<td>2016</td>
<td>88 (76%)</td>
<td>8% (46%)</td>
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<tr>
<td>2017</td>
<td>194 (47%)</td>
<td>13% (39%)</td>
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<tr>
<td>2018</td>
<td>256 (51%)</td>
<td>51% (35%)</td>
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<tr>
<td>2019</td>
<td>319 (31%)</td>
<td>34% (15%)</td>
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<tr>
<td>2020</td>
<td>384 (16%)</td>
<td>53% (33%)</td>
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<td>2021</td>
<td>455 (51%)</td>
<td>53% (16%)</td>
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<tr>
<td>2022</td>
<td>532 (16%)</td>
<td>53% (18%)</td>
<td></td>
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<tr>
<td>2023</td>
<td>610 (18%)</td>
<td>52% (20%)</td>
<td></td>
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<tr>
<td>2024</td>
<td>711 (20%)</td>
<td>52% (22%)</td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td>848 (22%)</td>
<td>51% (24%)</td>
<td></td>
</tr>
<tr>
<td>2026</td>
<td>1,156 (24%)</td>
<td>51% (26%)</td>
<td></td>
</tr>
<tr>
<td>2027</td>
<td>1,327 (26%)</td>
<td>51% (28%)</td>
<td></td>
</tr>
<tr>
<td>2028</td>
<td>1,490 (28%)</td>
<td>51% (30%)</td>
<td></td>
</tr>
<tr>
<td>2029</td>
<td></td>
<td>51% (30%)</td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td>50%</td>
</tr>
</tbody>
</table>

Source: RSB 2018; Ark Energy Market Assessment (2019)