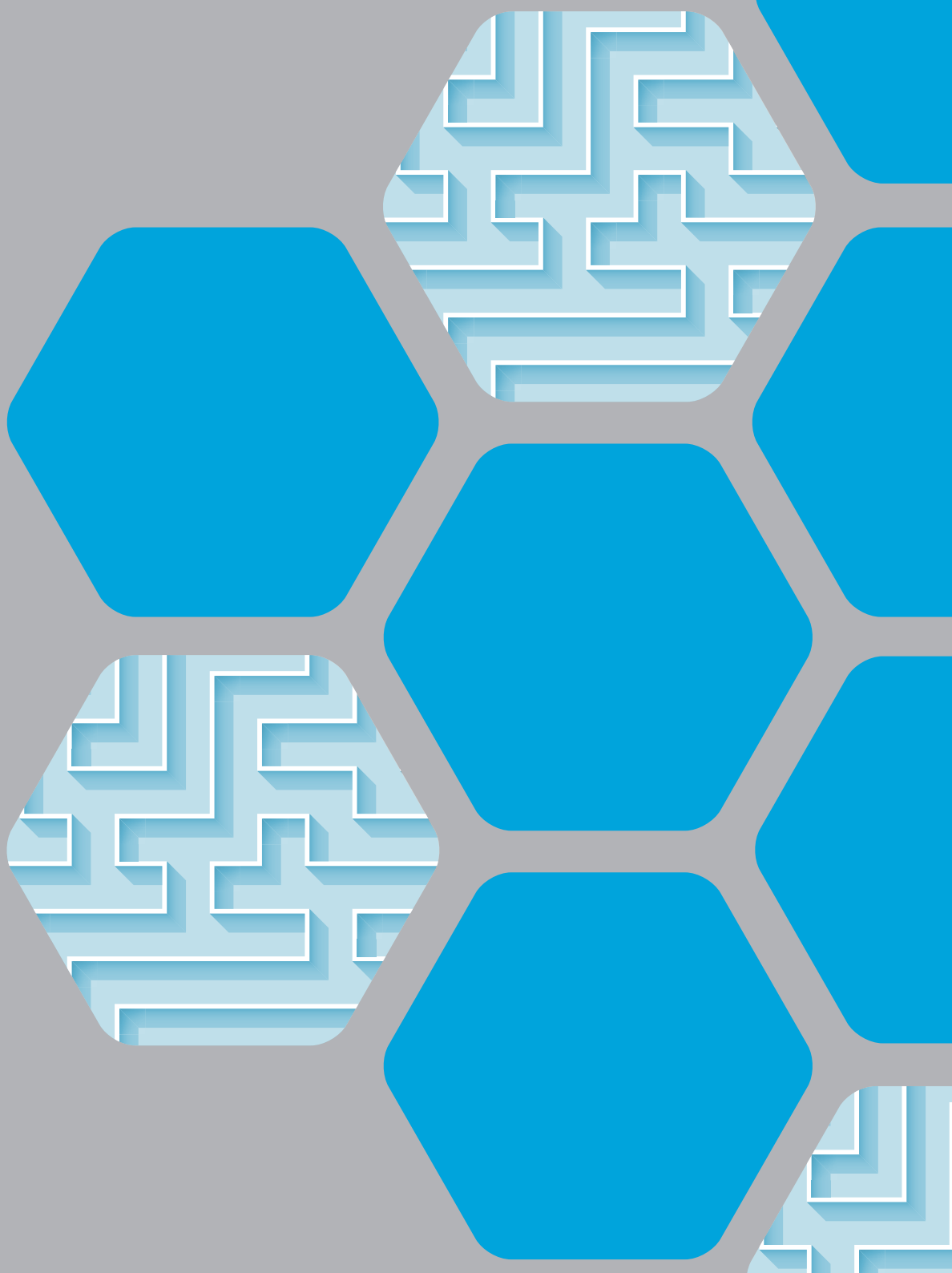
MANAGING FUTURE UNCERTAINTY

An introduction to integrating risks resulting from macro sustainability trends into business decision making

By the A4S Chief Financial Officer Leadership Network

APPENDIX



THE PRINCE'S CHARITIES
ACCOUNTING FOR SUSTAINABILITY

FOREWORD TO THE ARABIC EDITION OF MANAGING FUTURE UNCERTAINTY

We are proud to bring you the A4S Essential Guide to Managing Future Uncertainty in Arabic to mark the first GCC Chief Financial Officer Circle of Practice meeting, attended by His Royal Highness The Prince of Wales.

The Prince's Accounting for Sustainability, Abu Dhabi Sustainability Group and the Pearl Initiative are working in partnership to establish leading practice by the finance community in the Gulf through the Circle of Practice. The programme brings together CFOs from the GCC to explore practical approaches, and to take action to address major environmental and social risks and opportunities.

The Circle of Practice aims to:

- **Support the CFO community in the creation of sustainable business models** through exploring the commercial benefits of adopting a sustainable approach
- **Share insights, challenges and opportunities** to accelerate progress towards accounting for sustainability and collaborate with others to increase the reach and impact of member activities
- **Work together to implement the tools and guidance** developed by the A4S CFO Leadership Network to enable sustainability to be integrated into decision making
- **Influence the environment** within which businesses operate through engagement with investors and other stakeholders
- **Develop case studies and guidance materials** to be shared with the wider finance community in the Gulf

This Guide is the first of a series which will be explored by the Circle of Practice. It has been developed by the A4S CFO Leadership Network to set out practical approaches to understand and respond to risks resulting from macro sustainability trends, and integrate into business decision making. The introduction to this Arabic edition includes a set of four case studies setting out how organizations in the GCC are responding to these risks.

The first case study produced by **Etihad Airways** discusses how the business is responding to the risk presented by the aviation industry's dependence on fossil fuels, working as part of a consortium to build the world's first bioenergy research facility using desert land, irrigated by seawater, to produce both food and aviation fuels in Abu Dhabi.

The second case study produced by the **National Bank of Abu Dhabi** sets out work undertaken to understand the changing nature of the global energy system, the growth of sustainable energy in the Gulf region, and the financing opportunities that result from these trends.

The third case study produced by **Masdar** examines the portfolio risk management process adopted which incorporates sustainability considerations as core criteria against which all investments are assessed, using a mixture of rigorous quantitative and qualitative methodologies.

The fourth case study by **Abu Dhabi Airports** focuses on the sustainability considerations for the Midfield Terminal Building where the finance team undertook a full assessment on a life-cycle cost-benefit study to calculate the return on investment for the development of the building incorporating considerations such as minimising energy use into the design.

These case studies and the Arabic edition of this A4S Essential Guide are a preview of the work that will emerge from the Circle of Practice. The programme will adapt guidance to focus on those issues of most relevance to organizations in the Gulf and share practical approaches being adopted by CFOs and their teams to demonstrate effective ways of integrating sustainability considerations into finance processes and decision making.

We invite you to join the Circle of Practice to help us to showcase leading practice in the GCC.

Dr. Abdulla Zamzam, Senior Advisor at Environment Agency – Abu Dhabi and Chairman of the Circle of Practice

Jessica Fires, Executive Chairman at the Prince's Accounting for Sustainability Project (A4S)

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هيئة البيئة - أبوظبي
Environment Agency - ABU DHABI

ACCOUNTING FOR SUSTAINABILITY

مجموعة أبوظبي للاستدامة
ABU DHABI SUSTAINABILITY GROUP

PEARL INITIATIVE

ETIHAD AIRWAYS

Managing future uncertainty – supporting alternative sustainable fuels for the aviation industry

We are an industry dependent on fossil fuel, and one that will be reliant on a combustible, liquid hydrocarbon for many years to come.

The use of a finite source of energy presents an inherent risk, one exacerbated by severe price fluctuations, and potentially significant carbon costs in the future. Add to that the future certainty of supply, and quality issues in some regions of the world, and we have a major financial risk that needs to be managed across all timelines.

Currently, emissions related costs for Etihad Airways are limited to compliance to the European Emissions Trading Scheme for its intra- European flights. The scope of this compliance will be more extensive post-2020 when the global carbon offsetting scheme recently agreed at the General Assembly of ICAO, the International Civil Aviation Organization, is implemented. This capping of emissions at 2020 levels will require airlines to purchase carbon offsets to cover future growth.

Significant efficiency improvements are being made every day, and the industry continues to meet its 1.5% efficiency improvements target each year. Nevertheless, for an industry dependent on liquid hydrocarbon fuels for many years to come, the only way to look at significant de-carbonisation of the industry, truly decoupling it from growth, is to consider low carbon fuels. No easy task, but one that the industry has already embraced, making use of its innate innovative ability as well as making serious financial commitments.

Etihad Airways made a commitment to progress the development and use of alternative sustainable aviation fuel – not just that, but to drive it specifically in the UAE, where major progress has already been made in terms of developing and implementing renewable energy technologies. Initiated through discussions with the Masdar Institute of Science and Technology, an Abu Dhabi-based postgraduate education centre with a clear remit for clean and renewable technology advancement, the Sustainable Bioenergy Research Consortium was established, with founding members including Etihad Airways and Boeing.

The flagship project of the SBRC is the ‘seawater energy and agriculture system’ which may ultimately provide this plant based fuel. Effectively counterbalancing the challenges of the region, where freshwater is scarce, the system survives on saltwater as its natural resource, and where food security is a concern, the aquaculture element provides fish and other seafood, which in turn provide the nutrients for the saltwater tolerant plants.

The basis of the system is sound, having been successfully trialed in Eritrea. The system has now been replicated as part of a pilot project, on a two hectare facility in Masdar City, Abu Dhabi.

There is government backing, through the funding of the construction and ongoing operation of the pilot over the next three to five years. Takreer, the sizable refining entity of ADNOC, the Abu Dhabi National Oil Company, is now a member of the Sustainable Bioenergy Research Consortium, providing essential technical support to the development of a jet grade fuel from our raw plant materials.

Financial uncertainties remain regarding emissions related compliance costs for the industry, as the eligibility of carbon offsets will massively influence the industry demand and hence the purchase price . Flights using alternative sustainable fuels will be exempt or partly exempt, depending on the type and quantity of alternative fuel used, and in time will significantly influence the financial liability of the global offset scheme.

There is substantial work still to be done in alternative fuels development. To ensure commercial viability, a comprehensive techno-economic analysis has looked at the financial viability and scale up requirements of the SBRC project. But we need to remain focused. By making the necessary the effort and financial commitment now, long-term liabilities will be reduced enabling continued growth of the industry in a sustainable way.

National Bank of Abu Dhabi

Financing the future of energy

What did you do?

We commissioned PwC and the University of Cambridge to undertake a study to gather evidence behind the changing nature of the global energy system over the next decade, highlighting the growing demand for sustainable energy in the Gulf region; the technologies that are most likely to close the supply-demand gap; and the scale of the financing required. Arguments were prepared for why banks might choose to develop and support these opportunities, and how they can work with policy makers to positively enable this to occur.

Why did you undertake this study?

Energy has been the cornerstone of the economies of this region. Even now, as we see an increasingly diverse range of economic activity, the future of the Middle East is inextricably bound up with the future of energy.

The world's thirst for energy continues to grow and meeting the demand will be a real challenge. The rapid development of the GCC countries means we are part of that global picture. Energy demand, expected to increase threefold in the next fifteen years, will far outstrip today's supply. To close the gap will require huge levels of investment in projects that provide additional generation capacity and improve the efficiency of our energy use.

We should not under estimate the scale of the task facing us all. But, for the region, it gives us the opportunity to create solutions for highly efficient energy systems that both supply our energy needs locally and connect to a growing world market in energy technology. Since this will require innovative approaches to financing energy, we believe it also presents real opportunities for the region's banking sector. That's why we commissioned this report: we want to understand better what the real drivers are so we can respond to them effectively.

What approach did you take for your study?

Three forms of evidence were used in this study. Firstly, the report draws on global analyses from energy expert bodies and academic studies to present the core trends and context of supply and demand behind the changing nature of global and regional energy systems.

Secondly, the scenarios presented in the report draw on the Future Technology Transformation model developed by the University of Cambridge, derived from many previous academic studies and a solid regional and global database of energy investment trajectories. Thirdly, the report draws upon a wide range of interviews conducted in Abu Dhabi during the period October 2014 to January 2015, covering key policy, energy sector, project developer and banking industry stakeholders.

What's next?

The report sets out the global evidence on the future of energy within a Gulf region context. The intention is to provide the evidence base from which the financial services sector can consider their approach to providing products and services which will support the growth of the low carbon economy. The opportunity now is for financial services organisations to understand the evidence, explore the new structures that might be required, engage the relevant Governments and, ultimately, convert the trends into bankable solutions.

Over 170 GW of additional capacity will be required in the GCC region alone by 2020.

Masdar Case Study

Supporting sustainability objectives through portfolio risk management

Masdar is Abu Dhabi's renewable energy company and as such sustainability is part of its business culture, including decision-making on investment risk. This is managed through the organisation's Portfolio Risk Management (PRM) function and process.

In pursuing new investments, Masdar is responsible for generating returns on investments and managing risks by considering risk-adjusted returns. This strategy involves breaking risk categories into their smallest components and examining the effects of risk on individual investments, a business unit's investment portfolio and Masdar's total investment portfolio.

PRM enhances Masdar's ability to preserve existing and future value and returns by identifying and mitigating potential risk exposures across assets and portfolios through rigorous quantitative and qualitative best practice methodologies. PRM drives prudent investment and improves the likelihood that Masdar is adequately compensated for identified risks, while helping to avoid unwanted risks.

The roles and responsibilities of relevant Masdar individuals and teams in the PRM process are defined under Masdar's Portfolio Risk Management Framework (PRMF).

The Risk Operating Model supports continuous monitoring of significant risks to Masdar's portfolio. Understanding sustainability factors over time is a key aspect of this, which is looked at by continuous monitoring and holding risk assessment workshops with risk champions and the portfolio risk manager.

Risk workshops are conducted when:

1. Assessing a potential new investment

2. Projects move to the next stage of the investment lifecycle (the 4 broad lifecycle stages are defined as origination, development, operations and exit)

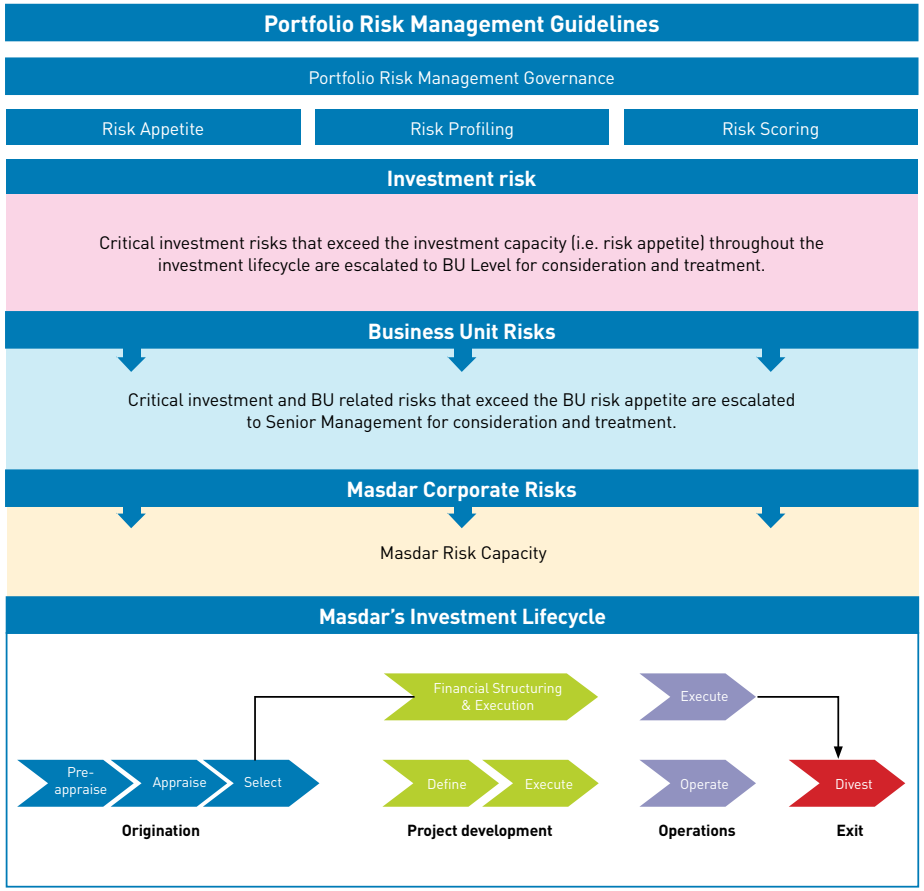
3. Preparing Business Unit and Corporate Risk Profile Reports

Risks are rated (ratings: low, medium, high and extreme) based on the likelihood of the risk materializing and the consequence (impact) if it were to materialize and quantified based on the impact to value and returns (NPV and IRR).

All key risk related information is captured within the PRM dashboards and are accessible to those involved in the PRM process. Dashboards only contain the information relevant to the end user and have also been created to reflect Masdar's risk escalation levels.

Reputation, Health & Safety and the Environment are core criteria against which risks are assessed. For each of these, sustainability considerations are a key concern – ensuring it is an established part of Masdar's business processes.

The risk monitoring and reporting steps outlined above ensure that sustainability considerations are embedded within Masdar's risk management activities, and remain a fundamental aspect of management decision making.



Abu Dhabi Airports

The Midfield Terminal Building – Passive Design to Save Energy

Introduction:

Passive design strategies assist in creating sustainable buildings by reducing dependency on fossil fuels for heating and/or cooling, as well as reducing the need for electricity to support lighting, and provide high quality indoor environments.

These strategies take into consideration the building plan, section, materials selection and site location, to create positive energy flows through the building enabling energy saving.

In this case study, we discuss how the design of the Midfield Terminal Building envelope and form was developed, taking into consideration initial investment costs towards passive strategies and its eventual financial benefits.

The Objective:

A life-cycle cost-benefit study was conducted to calculate the return on investment for implementing the proposed passive design strategies and to inform effective long-term decisions about both the building design and construction, in order to maximize efficiency over the whole life-cycle of the development.

The Challenges:

The challenges considered were that the MTB envelope must meet the following requirements:

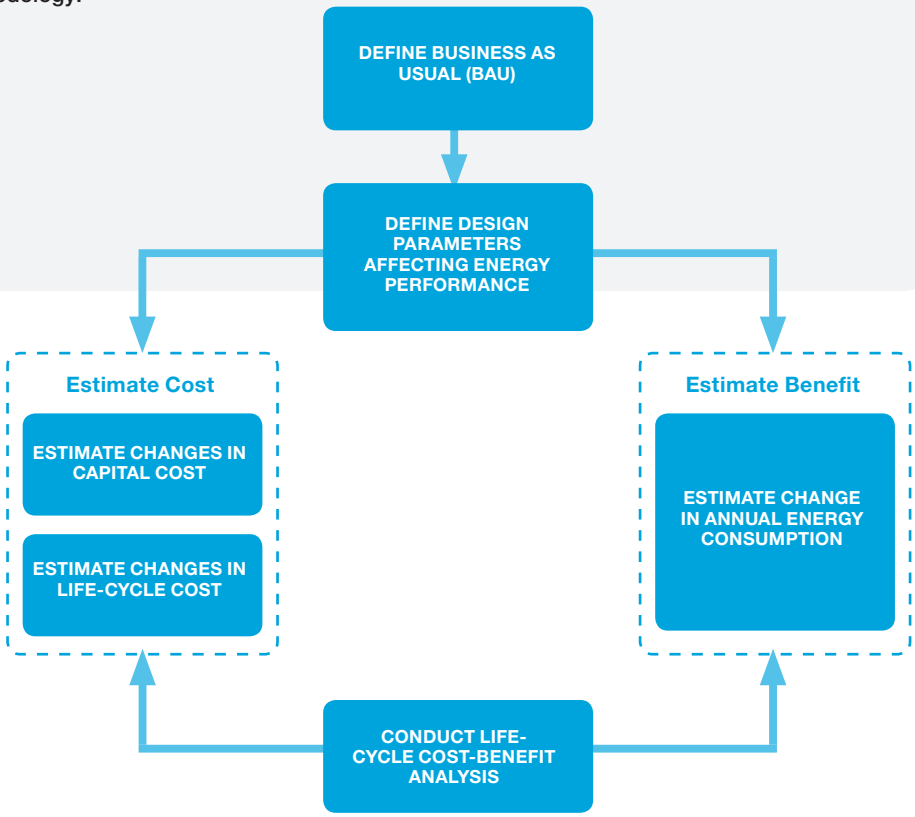
- Easily maintainable;
- World class design;
- Sustainable development; and
- Good daylight penetration and transparency.

The Methodology:

A systematic approach was adopted to evaluate the benefits achieved from each design parameter of the building envelope. This involved estimating the capital cost required to achieve the desired design, the associated operational cost (maintenance, replacement and energy consumption cost) and calculating the payback period associated with the investment towards the proposed passive strategy. The life-cycle cost-benefit analysis was conducted including energy modeling and cost modeling, comparing the performance of each strategy against a Business as Usual (BAU) case based on predefined performance parameters.

Noting that the MTB's total gross floor area is 700,000 m², and in order to simplify the analysis, the study was conducted for a building area of only 75mx50m and 16m height with 75% glazing cover on the two largest sides.

The following diagram describes the adopted methodology:



The BAU case was defined as meeting the minimum requirement of International Building Codes and unit rates for projects of a similar nature. The performance parameters have been defined as the key metrics to measure the impact of the design elements on energy and water consumption, as follows:

- Roof u-value;
- Roof reflectance;
- Air infiltration;
- Wall and glazing u-value;
- Solar heat coefficient (SHGC); and
- Area and shading of glazing.

The annual energy consumption was estimated considering the impact of the performance parameters on the following building elements:

- Lighting;
- Space cooling;
- Pumps and fans loads; and
- Utilities.

Cost Analysis Assumptions

The following items were identified as assumed for the cost estimates:

- The life-cycle replacement periods used in the analysis are based on published data, research, and feedback from comparable installations in use, and experience. The replacement cycles have been adjusted to account for the harsh Middle East environmental conditions.
- The maintenance costs are based upon planned periodic maintenance in accordance with good industry practice and manufacturers' recommendations of the above ground building envelope, specifically: the roofing system, glazing and flashing systems to prevent moisture or air from infiltrating the building.
- The energy consumption costs are based upon the UAE tariffs for electricity of 0.15AED per kWh and chilled water of 0.22AED per TR, and Chilled Water: 0.22 AED/R.Ton-hour = 0.06264 AED/kWh cooling.

The Findings:

The study resulted in the demonstration the current MTB enveloped design, for the area size of 75m x 50m, encompassing the proposed passive design strategies will result in the following:

- Total energy saving: 445,000 kWh/annum
- Total utility cost saved: 48,505 AED/Annum

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Note from Dr. Abdulla Zamzam, Circle of Practice Chair:

I would like to thank all the project team members, including the A4S team, for their commitment and contributions to the project so far and look forward to working together over the next phase of the project.

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