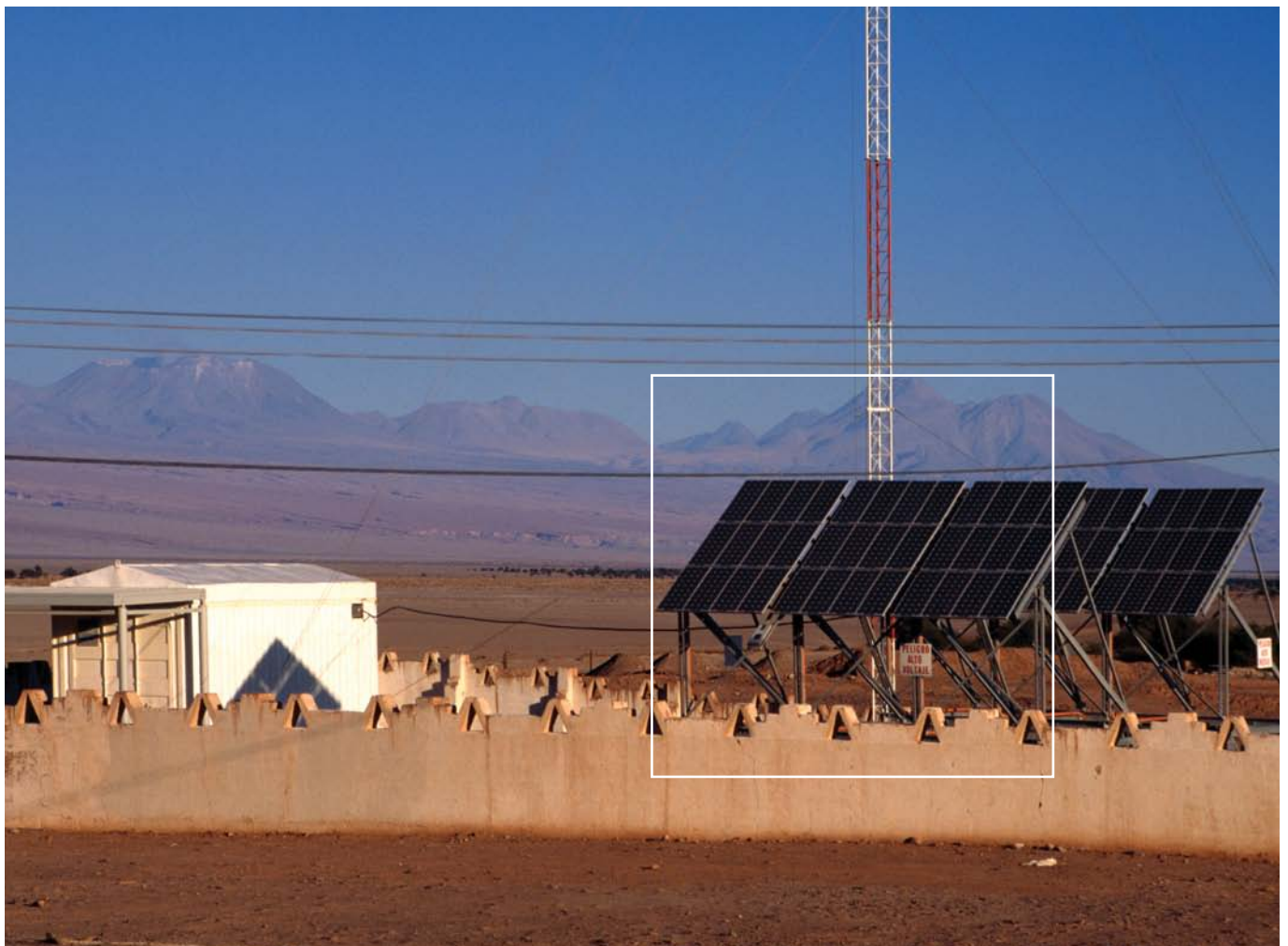


Telecom Operators in a Carbon Constrained World

Findings of an Arthur D. Little Survey in the Middle East and North Africa



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Authors:

Diala Akkari, Melissa Barrett, Nancy Busellato and Davide Vassallo

Executive Summary

For telecom operators, the business case for sustainability is a robust one. As well as lower costs, improved brand reputation, and new product offerings, operators can look forward to a greater share of the growing market of businesses and consumers demanding higher environmental standards of their suppliers.

To date, information about what operators in the MENA region are doing, and why, has been limited. To create a better understanding of the level of sustainability management in regional telecom operators, Arthur D. Little carried out a survey – the first of its kind in the region.

Cost reduction emerged as a key influence driving telecom operators in the MENA region to reduce their energy use. Pressure to comply with a (global) parent company's requirement to reduce emissions also drives reduction in energy consumption, although the regional operators themselves do not attach strong strategic significance to reducing CO₂ emissions. While regulation is potentially a further driver for change, it is still at an embryonic stage in MENA. In the absence of a developed regulatory framework, operators do not attach significance to this aspect of their emissions. However, the situation could change radically and swiftly, depending on the outcome of the United Nations Climate Change Conference in December 2009, aimed at forging a unified approach to CO₂ emissions regulation.

The survey found some regional telecom operators better positioned than others to respond to regulatory change and gain the business benefits of sustainability through better management of energy and carbon. Five key findings emerged:

1. Few operators take a proactive or leadership role on carbon management, as most see it as a cost center rather than a strategic activity.
2. Carbon and energy management is rarely integrated in the organizational structures or processes of telecom operators.
3. While most MENA telecom operators are engaging in environment friendly initiatives, we did not find one with a green product strategy.
4. Many telecom operators place emphasis on energy and carbon saving initiatives for cost saving and operational efficiency reasons, but are still far from achieving their savings potential. Arthur D. Little's analysis shows an average 20% energy savings opportunity for operators.
5. Significant disparity exists between operators in the region in terms of their energy consumption per customer; some are comparable to the global best players. On CO₂ emissions per customer, in contrast, most of the regional operators performed worse than the benchmarked global leaders.

For telecom operators in the MENA region, a more proactive approach to carbon and energy management can create significant value for the organization through realizing cost saving and revenue generation opportunities. The market is open for regional sustainability leaders to emerge and capture a first mover advantage, subject to specific execution conditions. This paper concludes with recommended routes to improvement and a quick-fire self-assessment of the current status of the reader's organization.

Sustainability, Carbon and Telecom Operators

Ask an average telecom operator what are the biggest risks facing their business. The answer will almost certainly include technical risks related to service reliability and equipment safety and security, financial risks such as fraud, and regulatory risks of compliance failure.

Then ask what are the biggest opportunities facing the business. At the forefront in a typical response will be digital technology innovations, service bundling/unbundling, consolidation and/or expansion into underserved markets.

Such responses illustrate why many telecom operators remain 'average'. They're missing a set of business opportunities and risks that global leaders, in contrast, have picked up and acted on – opportunities that fall under the umbrella title of 'sustainability'.

In broad terms, sustainability is about 'meeting the needs of the present without compromising the ability of future generations to meet their own needs'. This is not merely a theoretical concept for politicians or philanthropists. Business opportunities for the telecom sector lie in sustainability's **social responsibility** dimension: delivering social inclusion, improved quality of life, and opportunities to develop livelihoods in local communities. Bottom-line benefits are to be found in the **environmental stewardship** aspects of sustainability – better use of resources such as energy and water, improved waste management, reduced emissions, and the like. The third dimension of sustainability, focusing on **economic prosperity**, speaks for itself.

In the Middle East and North Africa (MENA), two primary areas of sustainability present the most strategic importance:

- Managing energy – realizing cost savings from energy efficiency.
- Managing carbon – achieving compliance with the requirements of a parent company and realizing potential revenue generation opportunities.

Telecom players consistently rank among the top three electricity consumers nationally in most EU countries.

For example, in 2007 BT used more than 0.5% of the UK's total consumption, at 1.99 TWh. In the MENA region, our study shows that the proportions are similar, ranging from 0.1% of grid consumption by mobile operators and reaching 0.8% for incumbent mobile and fixed line operators. The region also has issues of supply continuity, with electricity demand outpacing production and the grid struggling to deliver.

Moreover, limited grid coverage due to MENA's regional topography means that operators depend on diesel generators to supply up to 60% of their electricity needs, resulting in higher emissions. So the telecom sector represents a serious liability in terms of climate change.

Through focusing on improved energy efficiency and carbon management, telecom operators in the MENA region can look forward to lower costs, enhanced brand reputation and new product offerings. This in turn will attract new customers among the growing proportion of businesses and consumers who demand higher environmental standards of their suppliers.

So why are operators taking a long time to act on this business case?

Telecom operators that are seeking to manage their energy and carbon effectively are reaping significant rewards. For example, BT has saved over £800 million through energy efficiency measures. Plans to build its own wind farms will give BT, by 2016, a clean energy source for up to 25% of its UK needs.

Survey Motivation, Methodology and Scope

Arthur D. Little sees energy efficiency and carbon management as good indicators of the quality of overall sustainability practices. We decided to carry out a survey of telecom operators to better understand the level of sustainability management and how it varies within and between regions. First to fall under the spotlight were the countries of the MENA region.

This is the first study of its kind. No comparable data existed previously.

The methodology underpinning the survey aims to measure:

- To what degree companies are implementing sustainable activities connected with energy and carbon management
- To what degree they are deriving financial value from those activities, as part of a process of leveraging sustainability for competitive business advantage

In our experience, and that of other industry experts, global players are more inclined to aim for such advantage. Before we carried out our survey, we already had anecdotal evidence that regional players, in contrast, prefer to focus on risk mitigation and cost reduction.

Interviews with senior management included questions about whether the company had any carbon policy at all and, if so, what form that policy took. They examined how well the company was organized to make the best use of energy consumed while reducing CO₂ emissions. The existence and nature of company-wide or other initiatives to save energy and reduce CO₂ emissions, thereby cutting costs and/or building the company brand, was discussed. In addition, this assessment explored any efforts to create business value through product or service offerings that could be differentiated on a 'green' – i.e. low energy, low carbon – basis.

We also carried out a quantitative assessment of energy usage and carbon emissions for each company taking part in the survey. We used as comparative key performance indicators (KPIs) the grammes of CO₂ and the kilowatt hours per customer for each operator¹.

Of 34 operators contacted in the region, twelve participated in the study. Together, they serve about 64 million customers.

¹ More accurate KPIs measure energy efficiency per telecom site (radio base station) or per level of activity (megabyte of traffic); however, these tend to require information that is only available for operators' internal use. Using energy consumption and emissions per customer as KPIs quickly provides an understanding of performance in countries with similar topographies and population distributions, although it should be recognised that the results are biased towards operators in more heavily populated countries, as energy and emissions levels are shared among a larger population base.

Regional Trends and Drivers of Change

Our survey found that many operators in MENA are seeking to reduce their energy use (e.g. through installation of energy-efficient equipment) and to adopt renewable energy. However, their motivation is mainly one of cost reduction rather than emissions reduction. Participants in the survey made it clear that reduction in emissions is not usually a strong strategic intent of operators in the region.

Parent companies with a strategic commitment to sustainability worldwide often push down implementation of that commitment to their regional operators. This drives reductions in electricity, water, and fuel consumption as well as increasing renewable energy use.

Regulation emerged in our survey as another potential driver of major change in the region, but one that is currently not high on participants' lists of concerns. At the moment, operators in MENA do not have an established regulatory framework to comply with in relation to carbon emissions.

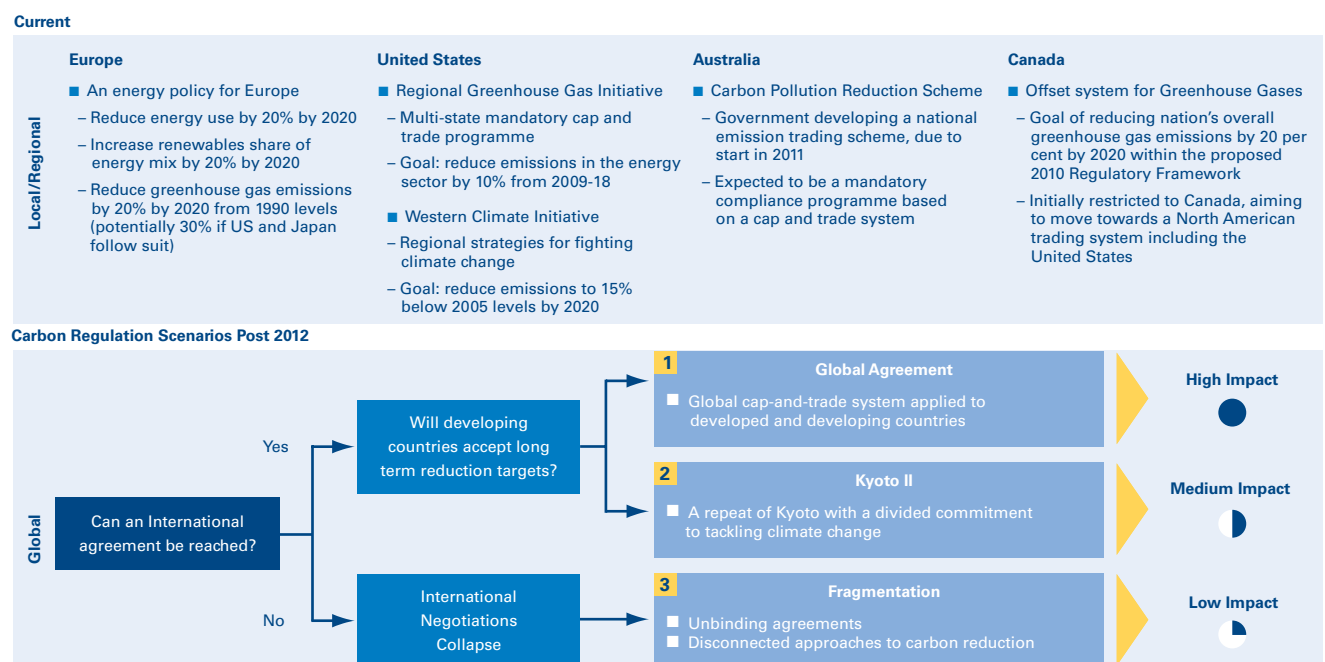
Although most telecom regulators that we spoke to believed that emissions should be regulated, the regulations themselves are at an embryonic stage.

There are no plans currently in place (among regulators who were interviewed) to institute such regulations. Regulators are supportive of voluntary measures to reduce telecom sector emissions, while promoting other 'green' regulations focused on battery and waste recycling, noise pollution from diesel generators, location and testing of radio base stations, non-ionizing radiation, and infrastructure sharing.

However, this situation could change – and very rapidly – depending on the outcome of the United Nations Framework Convention on Climate Change (UNFCCC) negotiations in Copenhagen in December 2009. (See Figure 1).

So operators need to be prepared to change radically at short notice. As our survey shows, some are better positioned than others to deal with this uncertain future.

Figure 1. Current action, future uncertainty



Source: Stockholm Environment Institute – A Review of Offset Programs (October 2008), ADL Carbon Futures White Paper (2008), Arthur D. Little Analysis

Telecom Operators and Sustainability in MENA

The qualitative and quantitative assessments carried out for this study highlighted five key areas where telecom operators in MENA stand to gain most from improving their management of energy and carbon. These findings are summarized in the following sections.

1. Most regional operators are reactive on carbon, but some thought leaders emerge

Few regional operators take a proactive or leadership role on carbon management, as most see it as a cost center rather than a strategic activity.

Of the operators we interviewed, more than 50% lacked basic carbon information, let alone strategic positioning, policies and KPIs on carbon for their business. Another 20% were on the border between this 'reactive' mode and 'aware'; in 'aware' mode, a company has performed a carbon audit, and management has started taking steps towards identifying carbon opportunities and risks, but KPIs or carbon reduction targets are still lacking and no conversations have yet taken place with suppliers about joint efforts to reduce emissions. Only two of the operators could be described as 'proactive'.

The regional best player has carbon KPIs, reduction targets and action plans in place. Carbon KPIs are reported annually through the parent company, and verified by a third party. Operational efficiency is achieved through energy efficiency with a cost-efficient expansion solution (solar base transceiver stations). An informal 'green' culture is taking root in the organization. There are also signs of a nascent green product approach.

While these attributes are encouraging, they should be seen in the context of what our analysis has identified among global thought leaders like BT and Vodafone. Such leaders maintain a public carbon strategy, and management leadership on carbon issues; carry out detailed reporting linked to the business strategy and actions; engage their suppliers to contribute to meeting the company goals; use lifecycle analysis to maximize the scope and positive impact of their actions; and engage with stakeholders.

2. Little integration of energy and carbon management into organisation

In the region, carbon management is rarely integrated in the organizational structures or processes of telecom operators.

Over half of the operators we spoke to had no role within the organization designated to manage carbon. They carried out sporadic initiatives relating to carbon management, but had no consistent long-term organizational framework. Approximately 30% of the operators surveyed did have a department designated with managing and overseeing carbon initiatives, trying to drive those initiatives across the rest of the organization.

In the regional best player, a designated department is responsible for CO₂ management, but there are also environmental champions present across all functions. Environmental campaigns are carried out to raise awareness among employees around preserving the environment. 'Green purchasing guidelines' are in place.

Meanwhile, in our experience of telecom companies leading the world at gaining competitive advantage and creating business value through sustainability, carbon strategy is set at Board level, with CXO leadership, and clearly expressed publicly. Every role has responsibility for carbon management, at every level. Key parts of the organization – such as R&D, and supply chain – have the carbon strategy embedded in them.

3. No green product strategy

While most regional telecom operators are engaging in environment friendly initiatives, we did not find one with a green product strategy.

The regional best player markets a limited number of products as 'green' products. Several other environmentally friendly products are available from this operator, but they are not marketed as green offerings.

Compare this with the behavior we observe in global telecom leaders in sustainability. They engage with consumers to develop green products, and have links with suppliers to develop low carbon products. 'Low carbon' is a core feature in the selection of products, with full responsibility taken at all stages of the product lifecycle. Low carbon products and services are fully integrated into the overall product portfolio. Such leaders are investing in and driving research into green technologies, developing competences and establishing partnerships to exploit emerging low carbon technologies in the future. In their company communication and branding, low carbon issues are prominent across all offerings, and product carbon footprints are clearly expressed.

Our experience working with global leaders shows that operators have an important role to play in educating customers about green products, as a first step towards developing the 'green' market and reaping future sales benefits. Regional operators seeking to emerge as sustainability leaders need to take on that role and may find further value in a 'green marketing strategy'.

4. Low realization of savings potential

Although many telecom operators in the region place emphasis on energy and carbon saving initiatives for cost saving and operational efficiency reasons, they are still far from achieving their savings potential.

Only a few operators have in place a company policy that favors energy and carbon saving initiatives, and virtually all the companies we interviewed pursue only initiatives with a short term economic justification.

An exception was the regional best player, which has regular employee sensitization on energy efficiency issues. This company has set clear quantitative targets for energy saving initiatives – reducing electricity and combustibles, and increasing the proportion of base transceiver stations powered by solar energy. Investment is being channelled into energy saving and CO₂ reduction technologies.

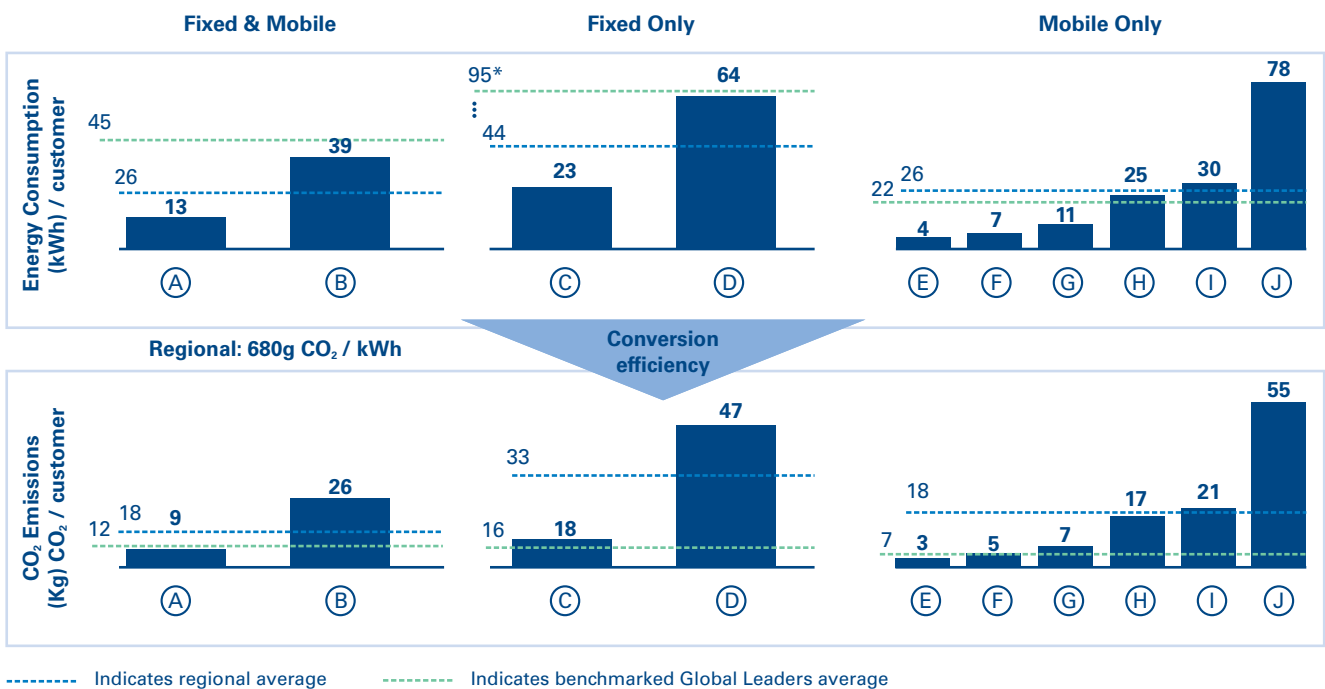
Even the best player has a long way to go to achieve its full savings potential, as exhibited by global best players. In our experience, the latter exhibit a highly mature energy and carbon saving strategy, based on a clear intent to 'produce more output with less fuel' and pursuing investments with a long term economic justification. A clear leadership position is taken on the importance of achieving energy efficiency across the organization; R&D spend on energy and carbon saving is at the top of the agenda; and the organization and culture, as well as the performance metrics, all reflect the energy saving strategy consistently.

Case Study – Sustainable innovation wins major expansion in customer base

A leading European mobile operator, seeking growth in its market share, identified the LOHAS (lifestyle of health and sustainability) population as a promising target segment to move in to. This segment is expanding rapidly (not only in Europe but also in MENA). Following a business case assessment, identification of environmental benefits, and calculation of the carbon footprint of various options, the manufacturing design and logistics of recycling were developed for a recycled and carbon neutral phone handset.

The launch to the target market resulted in some 15% growth in the company's handset sales, of which 50% came from new customers. The uniqueness and careful marketing and communication of the product attracted media coverage equivalent to about €1.5 million worth of advertising. In addition, 11 tons of waste were avoided and about 2,000 tons of CO₂ saved in the first six months after the launch. The handset has helped the company towards its goal of positioning as an eco-friendly company, and also better positioned it to anticipate legislative changes such as the European Community's WEEE (Waste from Electric and Electronic Devices) directive.

Figure 2. Carbon performance of the surveyed regional players



Notes:

Benchmarked global leaders are:

- Fixed & Mobile: Orange France, KPN Netherlands, Deutsche Telekom Germany
- Fixed only: British Telecom UK
- Mobile Only: T-Mobile UK, T-Mobile Austria, Vodafone Netherlands

* It is important to note that BT has intensive data center activity, which consumes a high level of energy.

Source: Company interviews, CSR reports, GhG protocol, Arthur D. Little analysis

5. Quantitative comparisons show disparity

We found significant disparity between operators in the region in terms of their energy consumption per customer² (See Figure 2). Some are comparable to the global best player. Others use significantly more kilowatt hours per customer. The surveyed regional fixed operators all ranked better than the benchmarked global leader with regard to total energy consumption per customer³.

²The (confidential) data provided by participants have not been directly verified by Arthur D. Little.

³In this context, it is important to note that some of the global benchmarks such as BT have intensive data center activity as well as high data traffic due to popular content services, which both contribute towards a high level of energy consumption.

However, on CO₂ emissions per customer, most of the regional operators performed worse than the benchmarked global leaders.

There are two main reasons why comparable energy consumption does not translate into comparable emissions. One is the increasing trend, among global leaders, to adopt renewable energy and green electricity. The other is the difference in the fuel used and efficiency of energy production between Europe and the MENA region.

Time to Rethink?

For telecom operators in the MENA region, the benefits of a more proactive approach to carbon and energy management will be significant.

Revenue generation opportunities await those prepared to differentiate their offering through sustainability: the competitive space is wide open for first movers in the green product segment, as no company has yet managed to integrate low energy, low carbon considerations across their organization and their portfolio.

On the cost reduction front, our analysis shows operators in the region could make an average of 20% energy savings; for some operators, the potential is much greater. This cost saving opportunity can be realized through:

- Technology improvements such as fine tuning, shifting to greener technologies, and operating at higher temperatures.
- Facilities improvements at existing shops and offices, or more radical approaches such as the introduction of new green shops; building efficiency into the design of new facilities (which may become mandatory).
- Innovative business models such as network co-siting, network sharing, mobile virtual network operators.

The route to improvement can be relatively straightforward, with a clear set of actions prioritized according to their potential business value. However, three executive conditions need to be met before any company can successfully implement sustainable strategies.

- Across the **organization**, a green culture needs to be developed; appropriate policies and procedures need to be put in place, and responsibility and accountability need to be assigned for meeting defined targets.
- In the **marketing** arena, the strategy must be built into and clearly reflected in the company's branding and positioning, with education for consumers on the benefits.
- In wider **communication** plans and activities, operators should engage openly on sustainability with the different stakeholders (regulators, consumers, equipment manufacturers); signals from the market showing demand for sustainable products should be captured regularly; and the operator's strategy and achievements should be published externally through annual sustainability reports.

How ready is your organization to achieve the business benefits of sustainability as described here? Our Quick-fire assessment (See Figure 3) can help you identify some quick wins for realizing immediate value from sustainability.

Figure 3. Quick-fire assessment of your organization's readiness for sustainability benefits

| Quick Wins | | Yes | No |
|------------|---|-----|----|
| 1 | Are you aware how much energy is being utilized by your different business units? | | |
| 2 | Are you aware of the energy saving potential you can achieve? | | |
| 3 | Are you aware of the different approaches for achieving energy efficiency and reducing carbon footprint? | | |
| 4 | Are you aware of the market opportunity for green products? | | |
| 5 | Is your organization aligned to take advantage of the carbon opportunity? | | |
| 6 | Are you aware of your stakeholders' position on carbon management? | | |
| 7 | Are you aware of broad sustainability risks and opportunities? | | |
| 8 | Are you aware of the opportunities in integrating your sustainability policies with your business strategy? | | |

Source: Arthur D. Little analysis

Contacts

If you are unsure or uncomfortable about your answers to any of these questions, or would like to compare your organisation against our survey benchmarks, please contact:

Germany

Klaus von den Hoff
+49 89 38088 714
vondenhoff.klaus@adlittle.com

Italy

Davide Vassallo
+39 06 68882 311
vassallo.davide@adlittle.com

Middle East

Thomas Kuruvilla
+971 4 433 5401
kuruvilla.thomas@adlittle.com

UK

Richard Clarke
+44 1223 427 170
clarke.richard@adlittle.com

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Regulators

UAE –Telecommunications Regulatory Authority
Lebanon –Telecommunications Regulatory Authority
KSA – Communications and Information Technology Commision
Morocco – National Agency for the Regulation of Telecommunication
Oman –Telecommunications Regulatory Authority
Tunisia – National Telecommunication Commission
Qatar – ICT Qatar

Operators

| | |
|---------------|---------------------------|
| Batelco | Omantel |
| Maroc Telecom | Orange |
| Mobinil | Qtel |
| MTC Touch | Vodafone |
| Nawras | Zain (Kuwait and Bahrain) |
| Ogero Telecom | |



Solar Power Panels Powering Telecoms Station

Telecom players consistently rank among the top three electricity consumption of operators in the MENA region ranges between 0.1% of grid consumption by mobile operators, and reaching 0.8% for incumbent mobile and fixed line operators.

Given this huge consumption level, our analysis shows an average energy savings opportunity of 20% with no or minimal investments; for some operators, the potential is much greater.

Dubai Internet City (DIC)

Dubai Internet City is regarded the Middle East's largest information and communications technology (ICT) cluster. Built as a strategic base for companies targeting emerging markets in several neighbouring regions, DIC's core focus area extends from the Middle East to the Indian Subcontinent, and from Africa to the CIS States, covering nearly 3 billion people with a GDP of over US\$10 trillion. As a knowledge-oriented business model, DIC has created a dynamic international community of IT companies hosting business partners that include some of the Fortune 500 brands, as well as a number of small and medium enterprises and ventures.

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