Smart
Energy

Veolia approach to sustainable and smart city

Today, natural resources are becoming increasingly scarce while our needs are growing in an ever more densely populated and urbanized world facing climate change issues.

The world has to rethink its relationship with resources and come up with new social and economic growth models that are more efficient, better balanced and more sustainable.

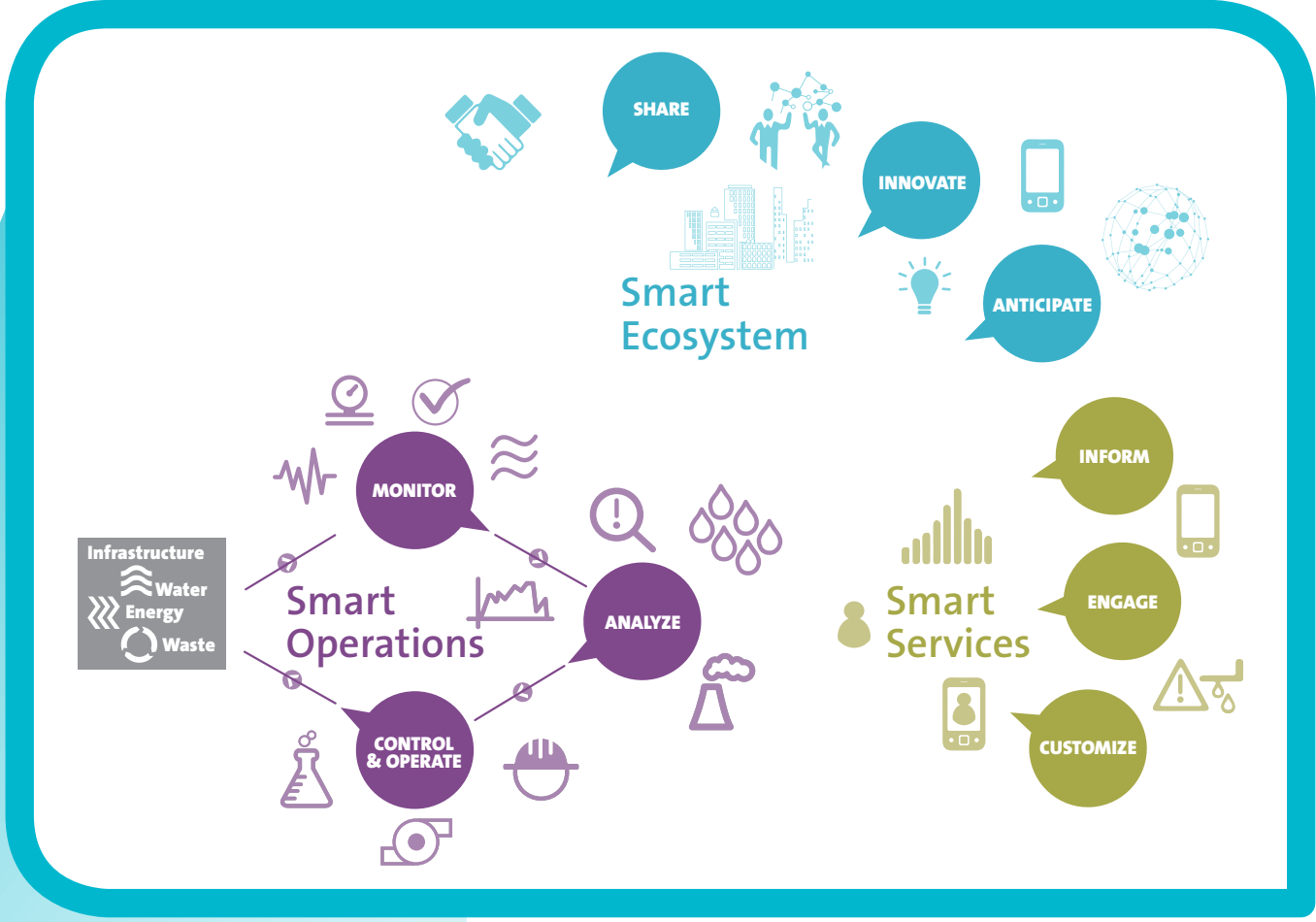
With 160 years of expertise in the areas of water, energy and waste, Veolia applies its capacity for innovation to pursuing human progress and wellbeing, and improving the performance of businesses and regions.

To make the switch from a resource consumption rationale to a use-and-recover approach in today's circular economy, Veolia designs and implements solutions aimed at improving access to resources while at the same time protecting and renewing those same resources.

Veolia accompany cities in their smart development through a network of companies and experts at three levels of integration:

- **Smart operations**
- **Smart services**
- **Smart ecosystem**

Veolia key figures 2013



Our proposal for Smart Cities

Using its extensive return of experience in being a partner to cities for 160 years, Veolia can develop and deliver innovative services tailor made to cities, using technologies as enablers, to support the achievement of the goals of city leaders for Smart Cities. These services include design and implementation of innovative solutions and assistance to leverage value from data and take action.

THREE AREAS OF FOCUS
have been identified where we consider Veolia would deliver the highest value to Cities:

1 WATER — Making the most of water resources by leveraging data for action

2 ENERGY — The city is connected to an energy efficiency platform

3 URBAN PLANNING & MODELLING — A new way to plan the sustainable city

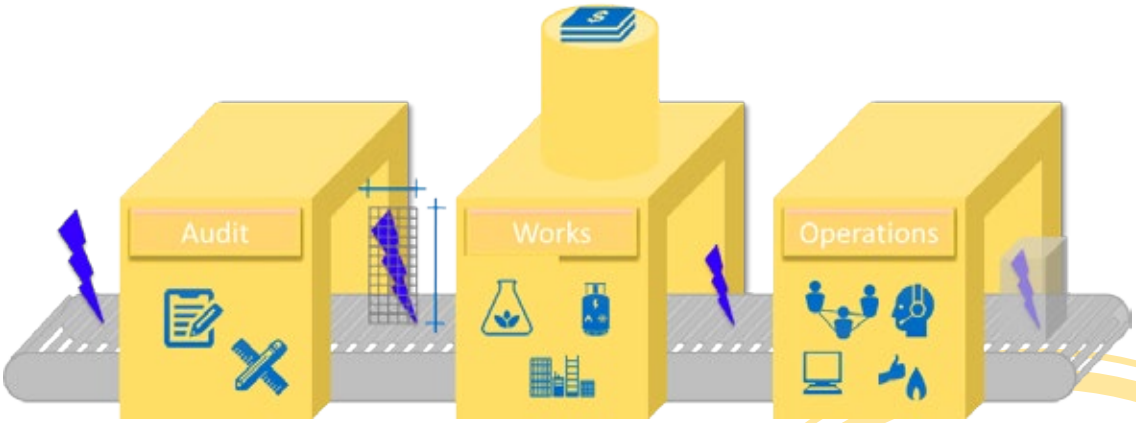
ENERGY

SMART=

the city is connected to an energy efficiency platform.

Improving the energy efficiency of buildings and processes is often considered as a valuable activity, bringing environmental, financial, and social benefits to the communities. However, even though energy conservation measures can be self-sustained as the savings will bring a payback for the investments in a relatively short time, such programs often face some hurdles in their implementation that can only be overcome by strong guarantees and measurement tools.

Energy savings should be looked at in terms of solutions, not products. With this in mind, Veolia has developed a suite of customizable solutions, based on a three step approach: first a comprehensive energy audit to determine the potential savings in the buildings and the baseline against which to measure them, then implementation of the actions, and finally operating and maintaining the equipment, monitoring the results to ensure the targets are achieved.



SMART CITY

towards an integrated energy savings center...

Considerations for energy management solution

Veolia recognizes that there are many different clients attracted by an integrated energy management solution. Depending upon the size of the operation and the sector in which they operate, the approach and end solution can vary significantly.

Our approach is to work with each client individually to develop a bespoke solution aligned to their specific businesses and long term objectives.

Supply of power and energy certainly depends on the customer we are servicing, and can be provided as process utilities, steam, superheated water, process chilling, controlled atmosphere, cogenerated electricity, compressed air and vacuum. For each type of energy provision, Veolia looks to optimize energy flows through demand control, distribution optimization, and production management.

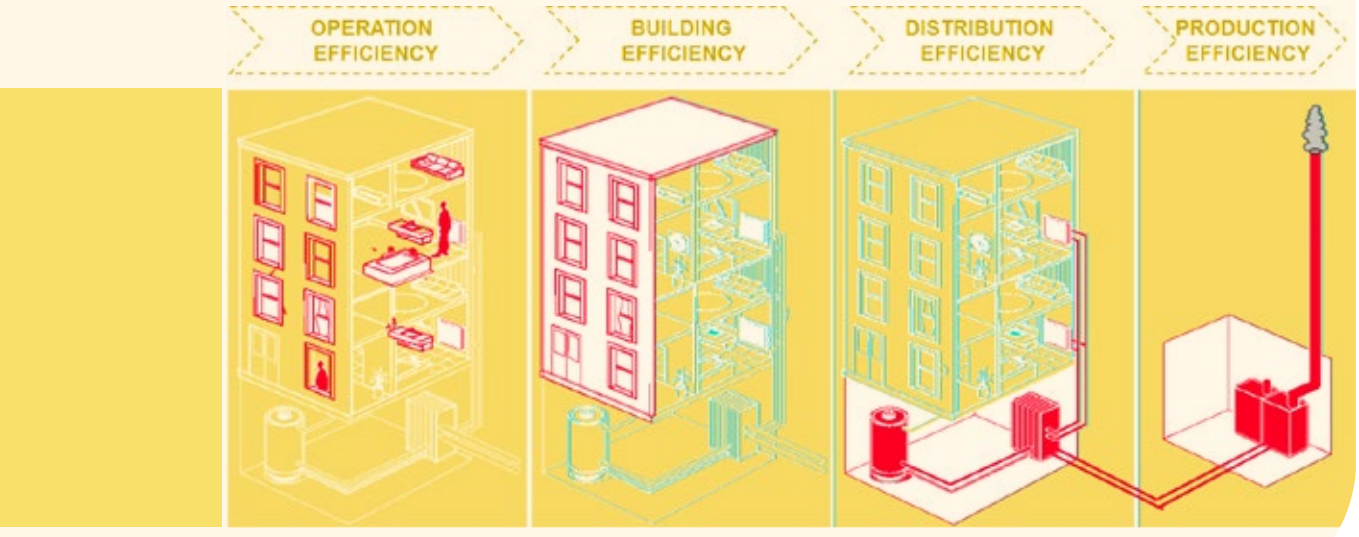
Veolia believes that the reliability of energy provision is essential to delivering energy savings. Therefore our Energy Performance approach has been designed to meet the following objectives:

- ☐ To ensure the continuity of utility supply with controlled cost
- ☐ To reduce energy dependency
- ☐ To reduce energy costs year on year through a target based approach
- ☐ To reduce the environmental footprint of our clients' sites

We therefore ensure a streamlined deployment of energy services by:

- ☑ Focusing on production and safeguarding against any shutdown of utilities production facilities
- ☑ Implementing site based resources and skills to prevent any downtime
- ☑ Making a technological breakthrough in the way our clients manage their energy

This approach can be applied to any business. Specifically for buildings, it will mean a strong guarantee on indoor comfort and air quality, as well as on significant energy savings



The Environmental Resource Management Center, core of a smart energy network

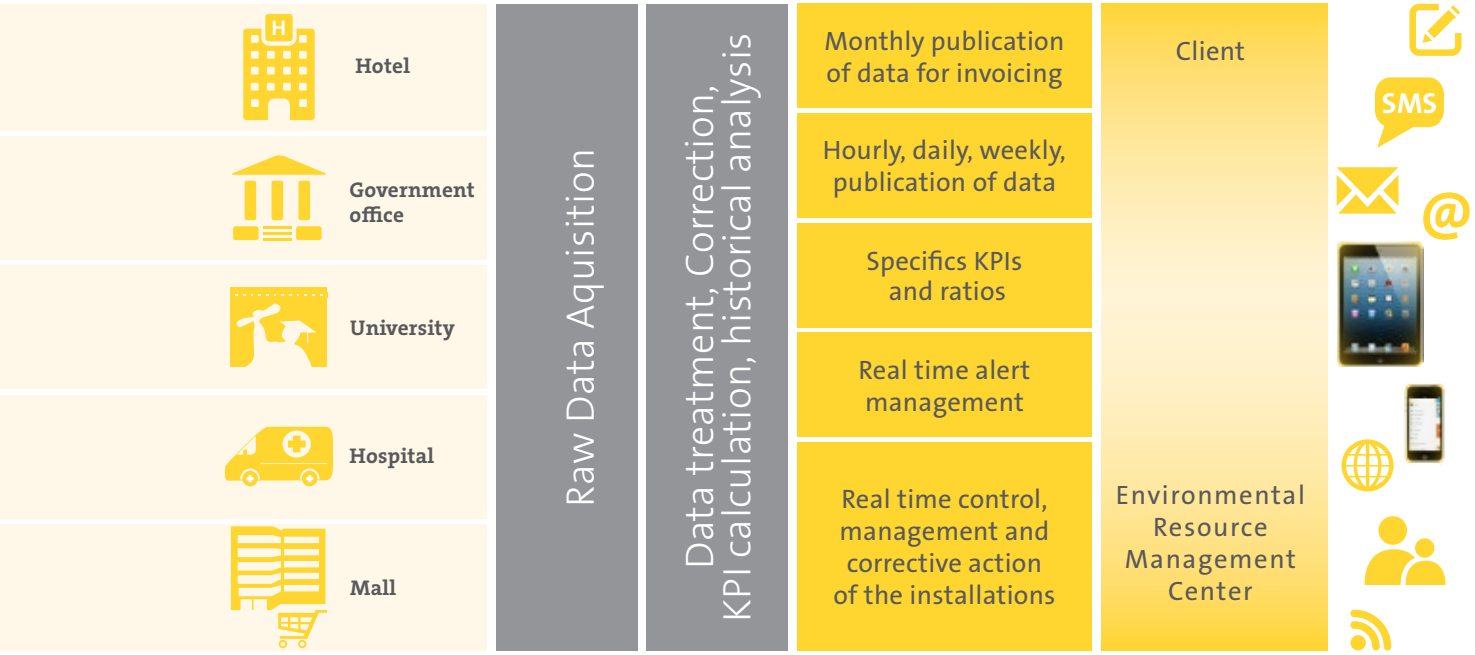
Veolia has created a modern, ambitious solution to achieve this objective: the Environmental Resource Management Center. Using a sophisticated data analysis system, the Environmental Resource Management Center can accurately monitor and analyse the energy usage of multi-functional, large-scale buildings, allowing our Energy Analysts to personalize this analysis against industry's best practices and international protocols.

The double objective of the Environmental Resource Management Center is to reach the guaranteed energy savings, and to demonstrate them:

- Monitor the utilities consumption
- Identify continuous improvements
- Measure guaranteed savings from ECMs (Energy Conservation Measures)
- Check the compliance with Measurement and Verification Protocols
- Give the client full transparency on the results
- Provide multi-support live information to a range of users

Key benefits

- ☑ Ensure equipment reliability – reducing current failure rates and maintaining continuity through the implementation of robust maintenance regimes and remote management of their application
- ☑ Improve users' and visitors' comfort – through maintaining effective temperature controls
- ☑ Guarantee the equipment's operation to its maximum efficiency – through monitoring remotely the systems and reporting to the site based team
- ☑ Highlight energy consumption within the building and identify efficiencies or over consumption through remote analysis and near-time benchmark with similar sites
- ☑ Allow end-user involvement and education thanks to customer friendly interfaces such as entrance lobby based screens



This ability to analyze and steer the energy usage of high energy consuming buildings such as shopping malls, hotels, airports and office buildings, combined with **Veolia's extensive experience in guaranteeing energy efficiency through optimized on-site operations and maintenance,** is the KEY differentiating FACTOR separating the Environmental Resource Management Center from other technologies.

Proven results around the globe

In Dubai where it has been recently launched, the Pullman is now connected to the platform with a focus on electrical, water meters and temperature.

Around the world last year, Veolia achieved worldwide energy savings that correspond to the average annual consumption of ~900,00 UAE inhabitants.

BUSINESS CASE

MAF Dalkia Energy Savings Center: a unique solution

MAF Dalkia is a joint venture created in 2002 between Majid Al Futtaim Ventures and Veolia, which offers to customers its expertise in developing, constructing and operating greener and more economical energy solutions.

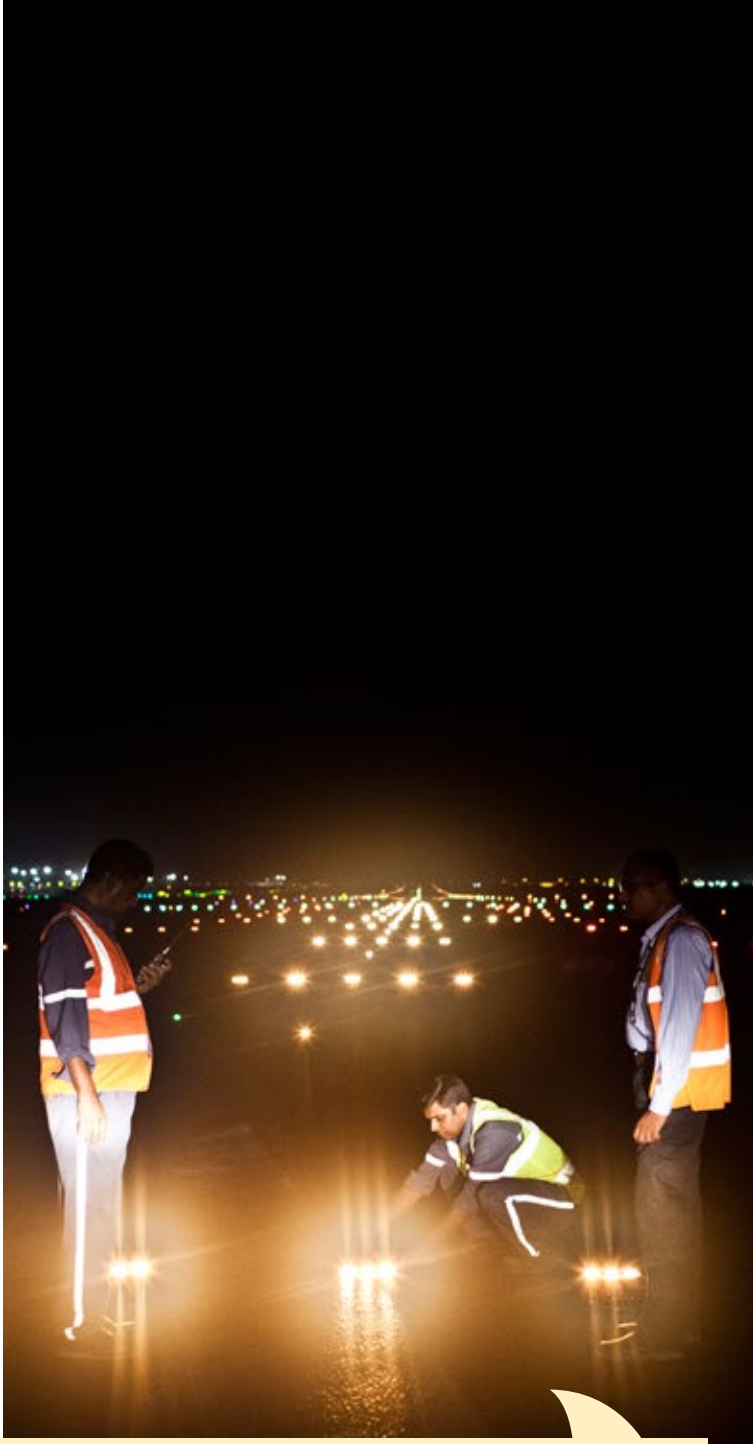
Reducing energy consumption in the buildings has become a crucial element in the quest to meet today's environmental and economic challenges, particularly in the UAE where it represents more than 70% of the country's electricity consumption.

A local implementation of the Veolia Environmental Resource Management Center, the MAF Dalkia Energy Savings Center and energy analysts are centralized in MAF Dalkia's headquarters in Dubai, capitalizing on an on-the-ground capacity of 2,000 in-house technicians and engineers across the region.

With systems deployed onsite, MAF Dalkia Energy Savings Center provides a highly visible and transparent overview of a site's actual energy consumption and more importantly, identifies areas of optimization and maintenance to then be carried out by MAF Dalkia's onsite or mobile teams:

- Through live data streams, a team of analysts constantly remote monitor the consumption, efficiency, temperature and operational programs of the various buildings and systems to ensure its optimal efficiency.
- This information is then communicated to the field based technicians who have practical knowledge of the buildings.

By managing each step of the process and bringing together the analysts, technicians and energy Auditors, MAF Dalkia is able to ensure that the optimum efficiency is attained.

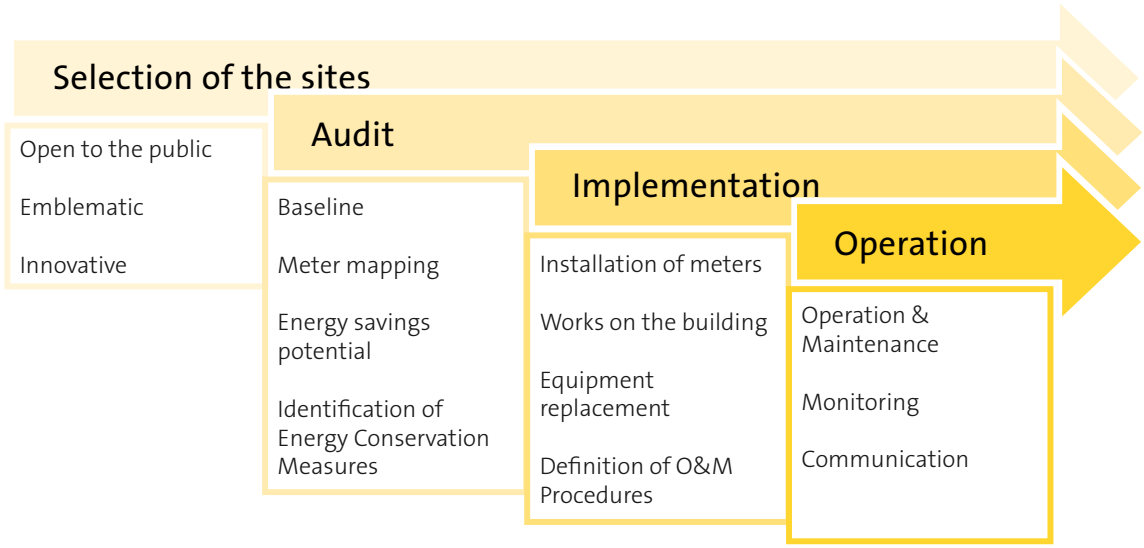


"With heightened focus on energy efficiency and in support of Dubai's 2030 vision to reduce energy consumption by thirty percent, MAF Dalkia is enhancing its building Energy Efficiency Services by introducing the Veolia Environmental Resource Management Center to the region. Our Energy Savings Center-based approach allows us to identify the right actions for each site, implement them, and guarantee the savings over the long term. It is our unique approach and commitment to energy management that has enabled MAF Dalkia to be the first Etihad ESCO (Energy Services Company)-certified company in the UAE."

Alex Mussallam CEO of MAF Dalkia

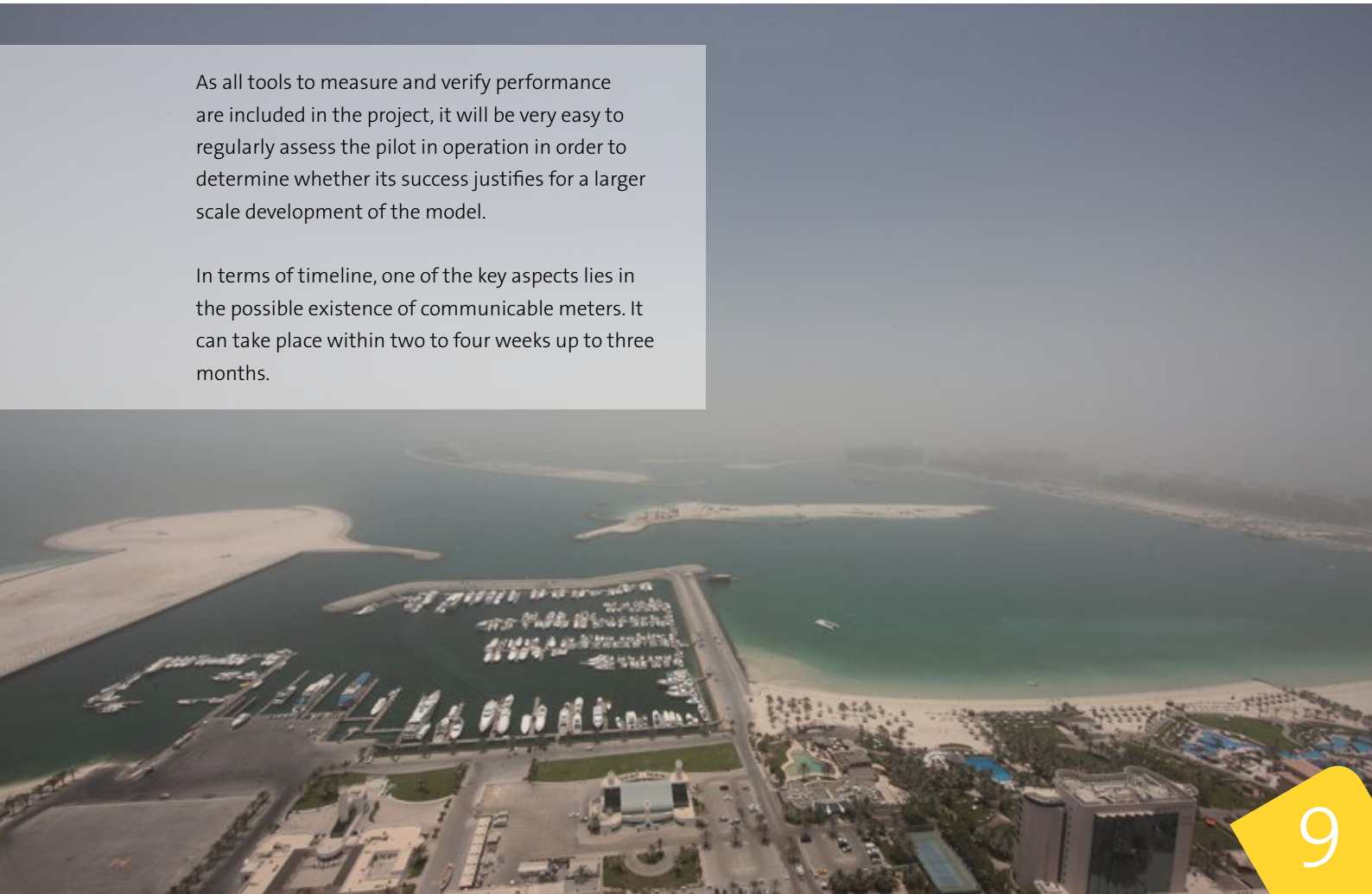
Setting-up a pilot platform in your city

The first step is to identify a building, or a group of buildings where we would apply an Energy Performance Contract through the Veolia Environmental Resource Management Center. We think that buildings open to the public are particularly interesting, since they provide natural attendance for a very large range of communication solutions. We also recommend that the building is recent and includes innovative energy technologies, in order to show that Veolia Environmental Resource Management Center can bring and guarantee energy savings even to such buildings. Once the site is identified we can roll-out our three-step approach:



As all tools to measure and verify performance are included in the project, it will be very easy to regularly assess the pilot in operation in order to determine whether its success justifies for a larger scale development of the model.

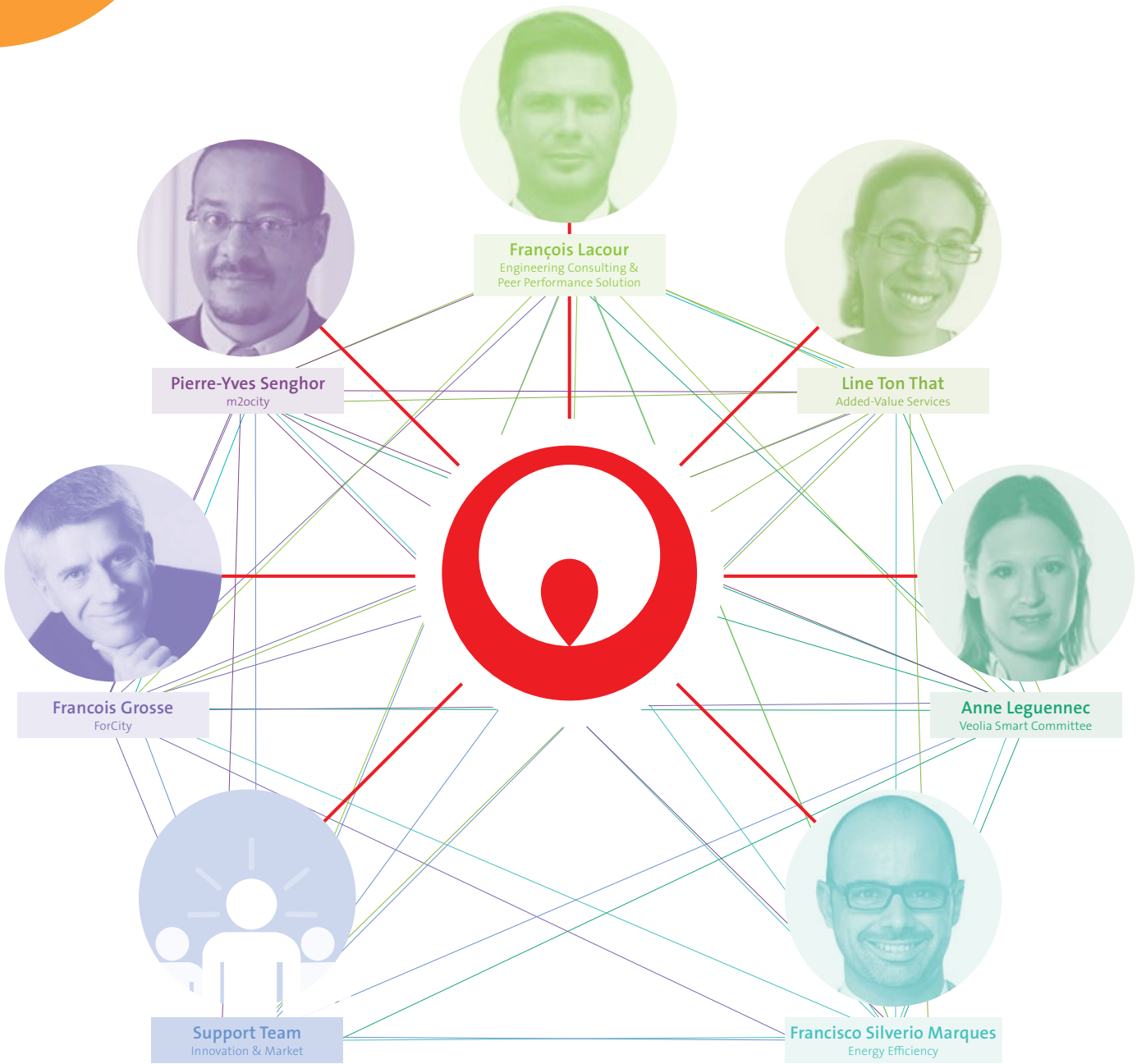
In terms of timeline, one of the key aspects lies in the possible existence of communicable meters. It can take place within two to four weeks up to three months.



Team

VEOLIA SMART TEAM

SMART=
global-local dedicated team to support your city.



Resourcing the world

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