

X&Y PARTNERS

Straight answers for emerging issues

2012 Yearbook

Our 12 most read articles from 2012

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Foreword



2012 has been a great year for us. Not because we have grown considerably: X&Y Partners is and will continue to be a small company. And not because there were significant advances in the areas we work on: renewable energies and clean technologies continue along a fast but somewhat rocky path; policies to address climate change are still timid; and the bulk of the work towards a more sustainable development still lies ahead us.

2012 was a great year for us because we took a decisive step towards sharing our knowledge. The 12 articles we have compiled in this yearbook are based on years of experience and many thousands of hours of work. There is of course a business rationale to this: our articles are meant to illustrate the talent, enthusiasm and hard work we put into each of our assignments, in the hopes that our readers can someday become our clients. We expect that some of them will, others will not. All of them can however build upon

what we have shared, putting us all one step closer to a sustainable and equitable future.

We hope you enjoy these 12 articles. Some of them cover a specific sector or issue, such as cannibalisation among renewable energies, emerging wind markets and alternatives to electric vehicles. Others cover more transversal management challenges, such as making market forecasts, asking for feedback and reducing product development time.

We also hope that you will get in touch with us after reading these articles: to hire us, to work with us, to provide feedback, or simply to introduce yourself. Until then, we wish you a fantastic 2013.

Romeu Gaspar

Cátia Carias

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Cannibalization in Renewable Energies

(Part I: Solar Energy)

More and more, renewable energies are competing against each other, instead of against conventional energy sources

If you read the reports from major energy agencies and industry associations, you might be tempted to conclude there is a bright future where all types of renewable energies will flourish and coexist peacefully. Well, they will not. Much like in any other sector, some technologies will trump others. In this two-part article, we analyze how solar photovoltaic (PV) is beating concentrated solar power (CSP), and how offshore wind is doing the same to wave energy.

Borrowing the nomenclature from our good friends at Insead, the renewable energy sector is quickly moving from a blue to a red ocean. Solar and offshore are two striking examples of segments where different technologies compete for similar resources, investors and policy makers. Let's first look at the solar case:

In the 1980s, concentrated solar power (CSP) seemed set to beat solar photovoltaic power (PV). While the latter relied on expensive solar modules more often used in small consumer electronics than in power plants (Exhibit 1), the former used tried and true technology borrowed from coal plants in order to produce vapor



Source: Alan Radecki, Wikimedia Commons

Exhibit 1 - The 354MW SEGS CSP plant, built from 1984 to 1990 in California's Mojave Desert.

and drive a turbine (Exhibit 2).

countries), access to water (just like a coal



Source: Sacramento Municipal Utility Distribution

Exhibit 2 - The 1MW Arco Solar PV plant, built in 1984 in Sacramento, the largest at the time

Twenty-five years later, the face of solar energy has changed dramatically. In 2010

PV had a global installed capacity of approximately 35 GW, compared with CSP's 1.5 GW (Exhibit 3).

Over the last years, we have had the privilege of working in these two sectors from multiple perspectives (supporting investors in selecting technologies and projects to invest on, helping start-ups in funding their ideas, and working with policy makers in defining incentive mechanisms) and believe that two factors have contributed the most for the dominance of PV over CSP:

Market size: PV can be installed almost everywhere CSP can, but not the other way around. Current commercial CSP technology needs higher levels of irradiance (typically those of the sunbelt

plant) and large-scale deployments (typically more than 20 MW, compared with the few kW of a residential PV system). This means that there are more tech companies, investors and policy makers interested in PV than in CSP (Exhibit 4);

Technological simplicity: a PV system is like a quartz watch, whereas a CSP system is like a mechanical watch. The former revolves around the solar cell, while the latter is a combination of equally critical components. This has allowed the PV industry to focus on solving one issue – driving down the cost per Watt – while the CSP industry is spread across multiple challenges e.g. improving the optical efficiency of collectors, researching new heat transfer fluids or procuring higher efficiency turbines (Exhibits 5 and 6).

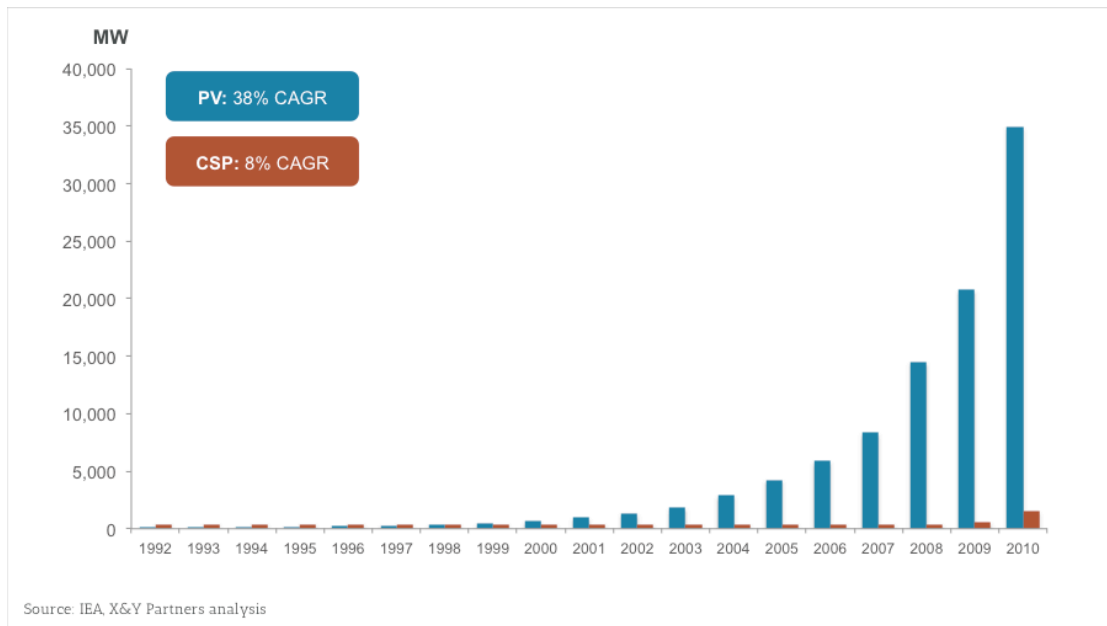


Exhibit 3 - Evolution of PV and CSP global installed capacity (MW).

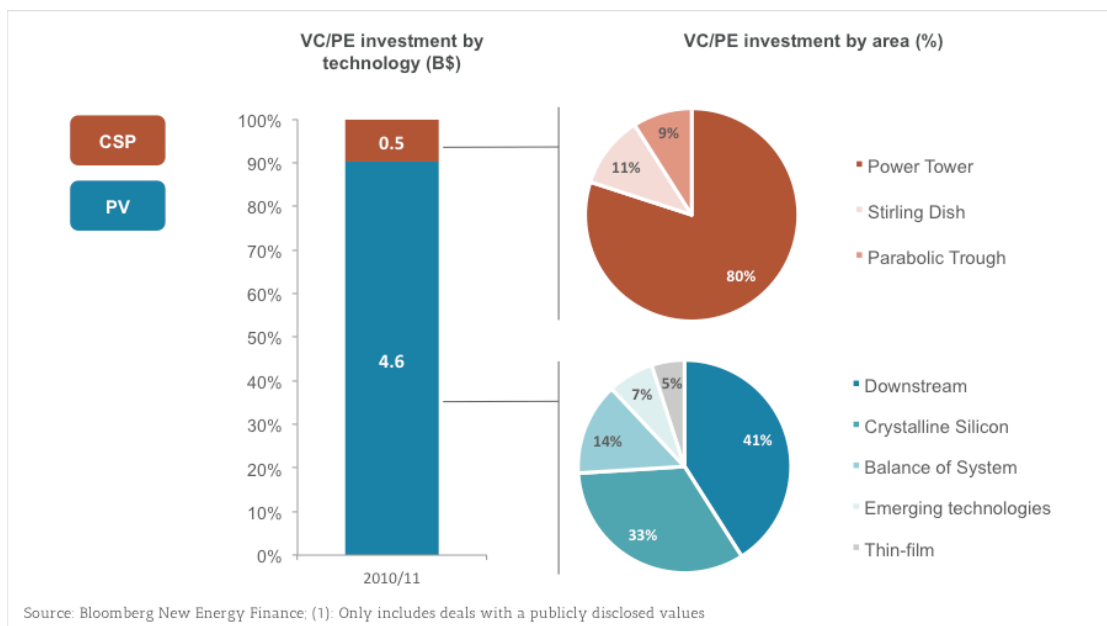


Exhibit 4 - Venture Capital and Private Equity investment in PV and CSP (2010/2011).

Does this mean CSP will eventually disappear, trampled by PV? Not necessarily. CSP has one major advantage over PV: dispatchability. Current CSP plants can store thermal energy for up to 16 hours, which means that their production profile can match the demand profile (just like a conventional power plant). PV is not dispatchable, as a

feasible commercial energy storage system does not yet exist. Dispatchability will be increasingly important when and where renewable energies achieve high penetration rates, so two things can happen: CSP becomes a commercially viable solution before a commercial PV storage system is developed, carving its own market segment; or the PV industry

quickly solves the storage issue and becomes the solar technology of choice. In the second part of this article, we look at

the offshore market to analyze how wave energy and offshore wind are also competing for the same resources.



Exhibit 5 - Impact/Probability matrix for CSP technological developments.

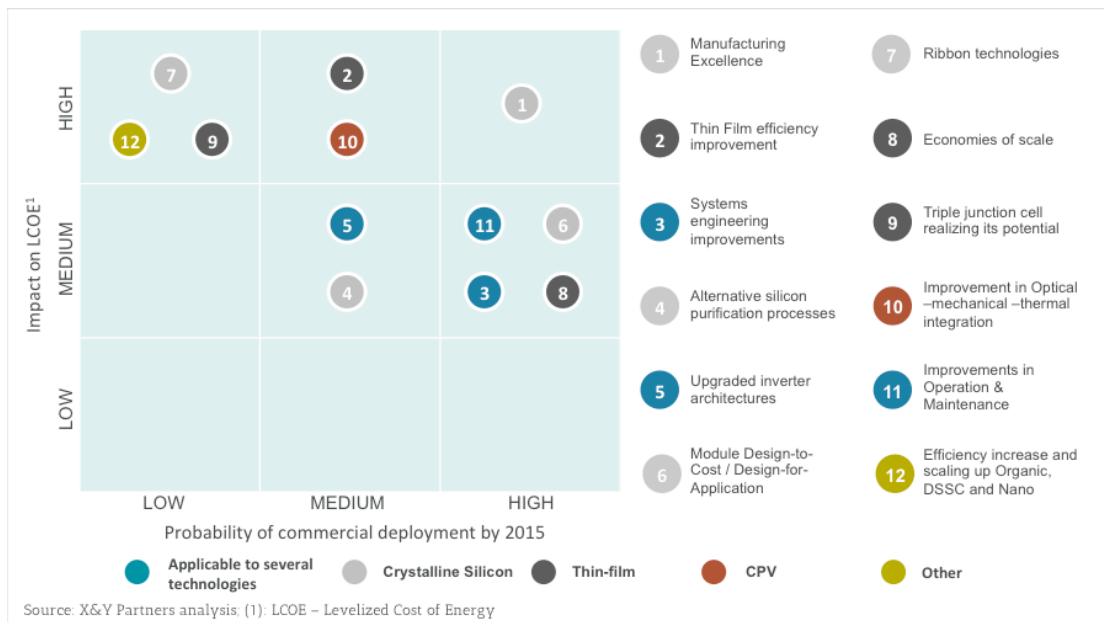


Exhibit 6 - Impact/Probability matrix for PV technological developments.

Cannibalization in Renewable Energies

(Part II: Offshore)

More and more, renewable energies are competing against each other, instead of against conventional energy sources

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Borrowing the nomenclature from our good friends at Insead, the renewable energy sector is quickly moving from a blue to a red ocean. Solar and offshore are two striking examples of segments where different technologies compete for similar resources, investors and policy makers. In the

first part of this article we looked at the solar example, let's now look at the offshore case: Not unlike fusion energy, wave energy (which is the most significant source of marine or ocean energy, a group which also includes tidal & currents, salinity and thermal energy) has been on the brink of a breakthrough for many years. While writing this article I revisited the earlier work we have done in this sector, and realized that the adoption of wave energy has significantly trailed our 2008 estimates. At the time, we predicted a global installed capacity of 50MW in 2011, significantly above the 10MW that were actually installed. Our 2015 estimates now also seem overly bullish when compared with IEA's latest forecasts (Exhibit 1).

Apart from the typically wide error margins of this type of forecasts (which we plan to discuss in a future article), where have we (and most of the industry) gone wrong?

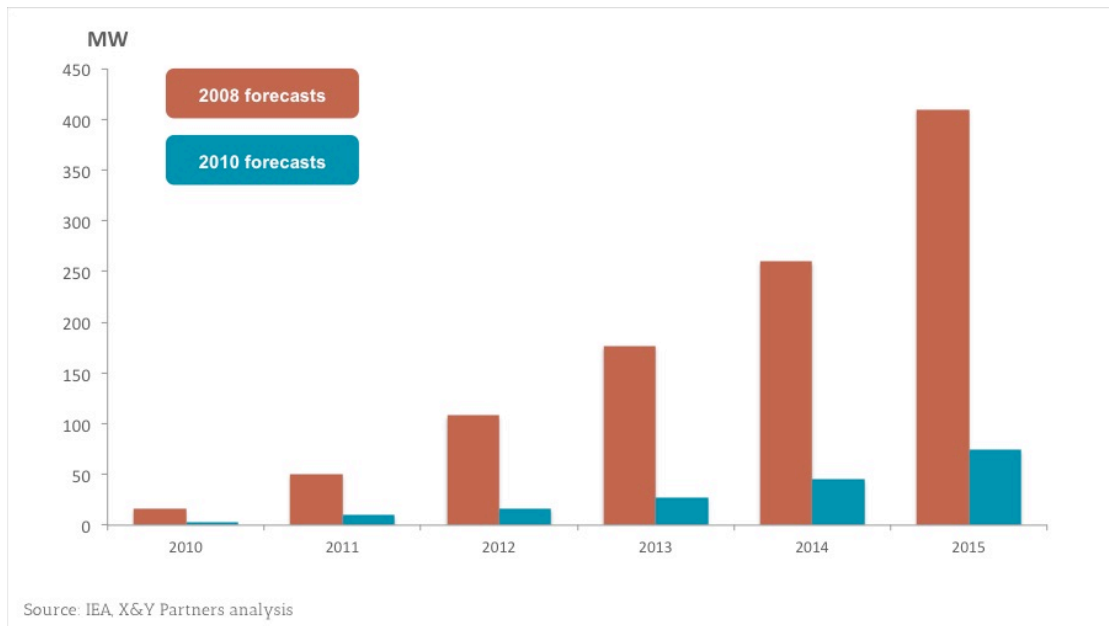


Exhibit 1 - Comparison of 2008 and 2010 global wave energy installed capacity forecasts

The blame is usually put on the 2008 financial system meltdown and subsequent credit crunch, but the problem could actually have been too much money, or at least the wrong kind of money. In 2008 close to 3B\$ were injected in the marine & small hydro sector through Mergers &

Acquisitions (a 149% increase over 2007), compared to only 0,3B\$ through Venture Capital and Private Equity (Exhibit 2). This provides an M&A to VC/PE ratio of 10:1, the second highest in the renewable energy sector that year (the highest was in the wind sector, where

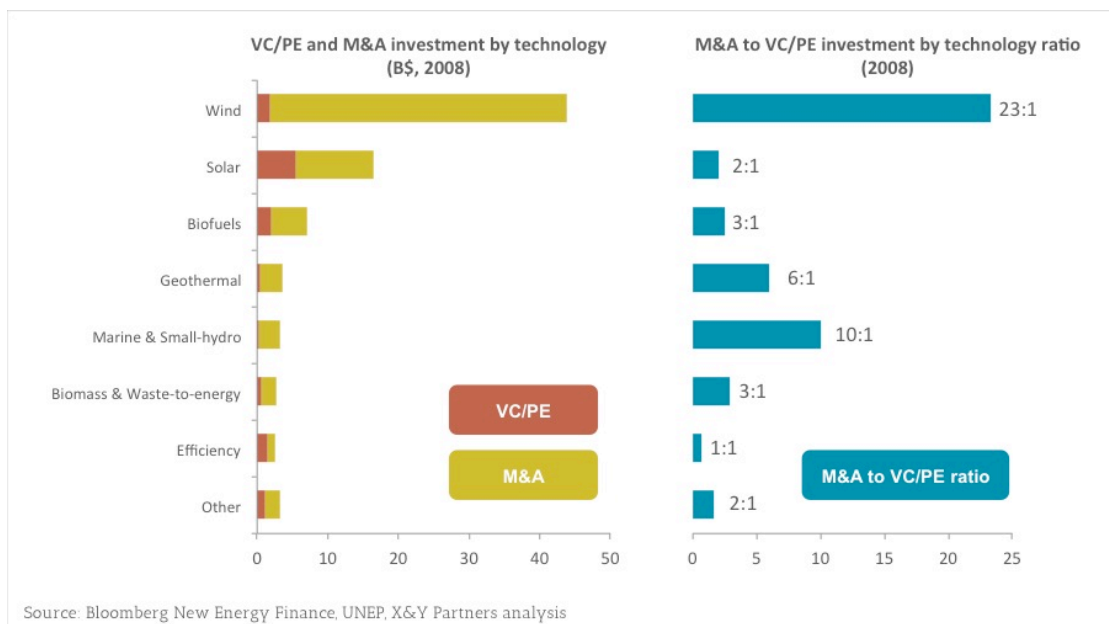


Exhibit 2 - Venture Capital, Private Equity and Merger & Acquisition investments in renewable energy (2008)

consolidation of the onshore industry drove record-high M&A transactions).

VC/PE and M&A money serve different purposes: the former is predominantly used to research & develop a technology, while the latter is used to scale it up (Exhibit 3).

larger-scale deployments, hurting both investors and investees.

The rise of offshore wind was also not trouble-free. Its first installments used turbines originally designed for onshore applications, not for the much harsher marine conditions. As a result,

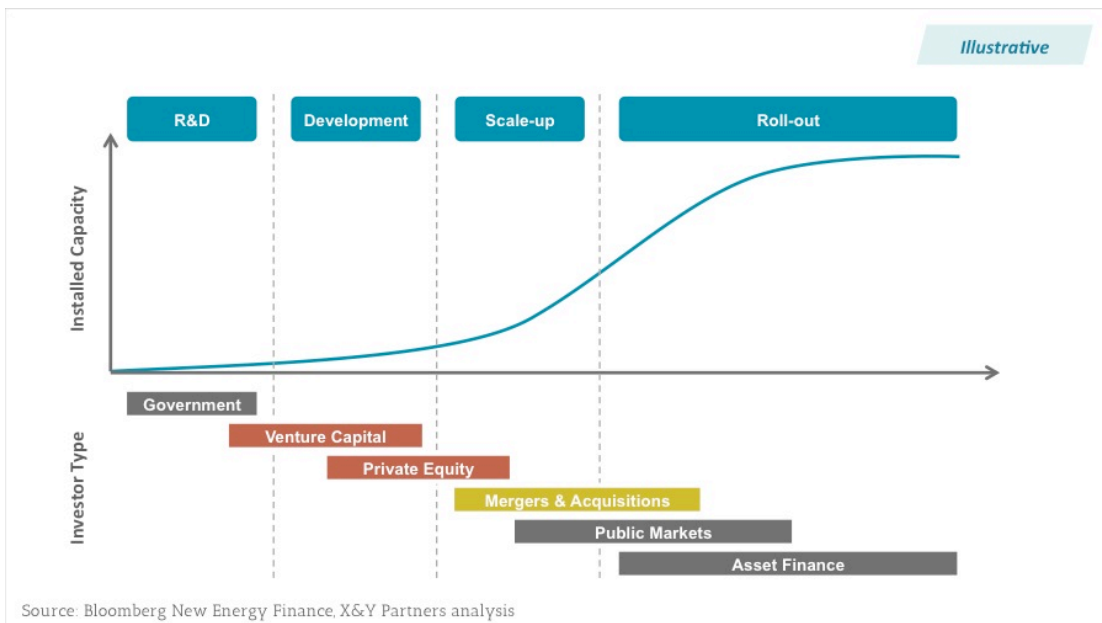


Exhibit 3 - Typical investor profiles for different renewable energy maturity stages

At a time where wave energy was still trying to overcome important technological and engineering obstacles (Exhibit 4), having 10 times more M&A money than VC/PE money might have rushed the technology into

and just as with wave energy, these systems would often break down, resulting in downtime that could span across several months, before sea conditions allowed for access to the platform.

"In October, during final preparations for positioning the three 750 kW Pelamis machines on site at Aguçadoura (northern Portugal), it was noted that the mooring units had sunk down from their earlier position, and for no obvious reason."

"Verdant Power had six of its 35-kW turbines installed in the East River NY, USA, in 2006/7. Reports indicate multiple failures."

"Project SeaGen: The deployment apparently went well, in spite of delays and re-design of the piling process. A blade failure was reported during commissioning in July 2011."

"On the Island of Pico, Azores, WavEC runs an OWC (...) type wave energy plant, presently among the very few functional wave power plants worldwide. Whereas 2010 had been a very successful year with the plant operating in autonomous mode for 3 months, yielding a total of 1425 operational hours and 45MWh fed into the grid, a severe generator failure halted operations until 2012."

"Open Hydro, the first deployment at the FORCE test centre in Nova Scotia, recovered their turbine from the site in December 2010. The device was still on station and the retrieval was successful. Blade failures had occurred and data analysis determined that the failures occurred during exposure to the second spring tides."

Source: IEA OES.

Exhibit 4 - Sample of reported issues in deployed wave energy devices.

However, four years have passed, and wave energy and offshore wind energy are now at two very different stages (Exhibit 5). Offshore wind turbine manufacturers have successfully developed models that can withstand harsh marine conditions, and the

sector is poised for strong growth, fueled by the shrinking availability of suitable onshore sites, and by the development of technology that broadens the range of suitable offshore sites (such as floating platforms for deep-sea deployments).

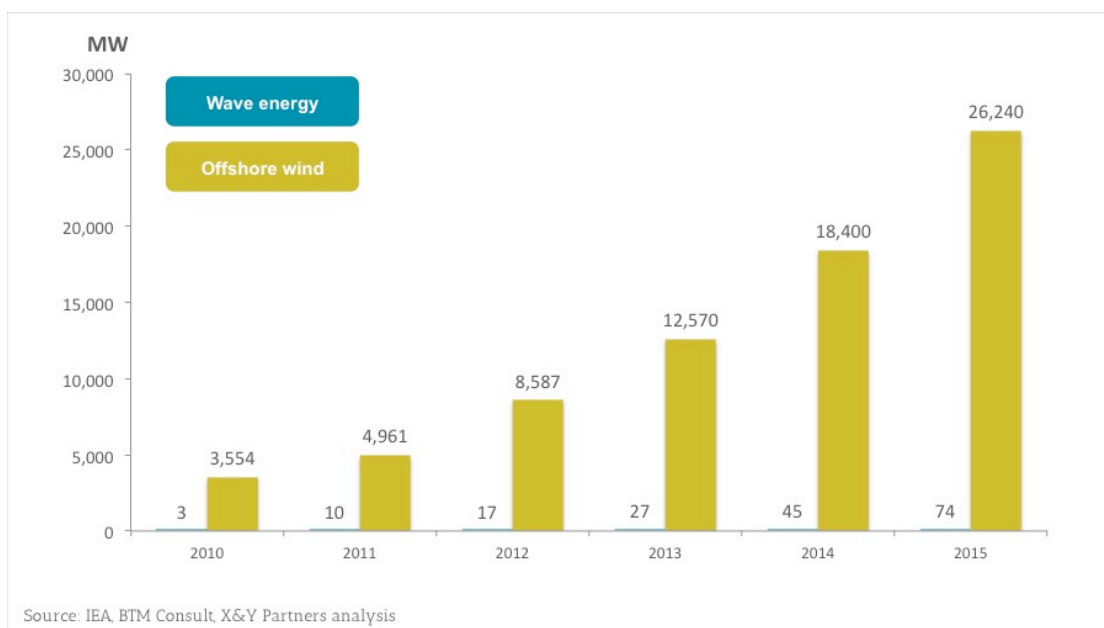


Exhibit 5 - Comparison of wave energy and offshore wind installed capacity forecasts (MW).

Does this mean wave energy will eventually disappear, trampled by offshore wind? Not necessarily. These technologies share the same space (water) but harness energy from different sources (wave vs. wind), which means that wave energy can at least evolve to become a viable option for locations where wave resources are better than wind resources. There is also a degree of complementarity between both technologies (e.g. a

hybrid wave/wind park can share grid connections and other infrastructures, diluting capital and operational costs), which could help wave energy to piggyback on the success of offshore wind.

Whether this happens or not will largely depend on the wave energy sector's ability to: i) solve the current technological and engineering obstacles; and ii) attract the right type of investors to do so.

Concrete wind towers: a low-tech innovation for a high-tech sector

Innovation does not need to be cutting edge, it only needs to solve a problem: three reasons why wind energy is borrowing solutions from the construction sector.

The global onshore wind sector is expected to grow 19% per year till 2015. Not as much as it has grown in the past (28% per year from 2006 to 2011) but still very respectful for a sector that is rapidly approaching market maturity (Exhibit 1). One of the key drivers fueling this growth is LCoE (Levelized Cost of Energy*) reduction, either by improving efficiency or by decreasing costs. Concrete towers do

not contribute to the former, but can contribute to the latter.

A wind tower is not the first thing that comes to mind when thinking about technological developments in wind energy, as its impact on system performance is very small. However, wind towers can represent more than 25% of the total WTG (Wind Turbine Generator) cost (Exhibit 2), which makes them a relevant area for cost optimization.

The ubiquitous steel tower already benefits from a level of steel manipulation and optimization far above those of most sectors, leaving limited room for improvement. The use

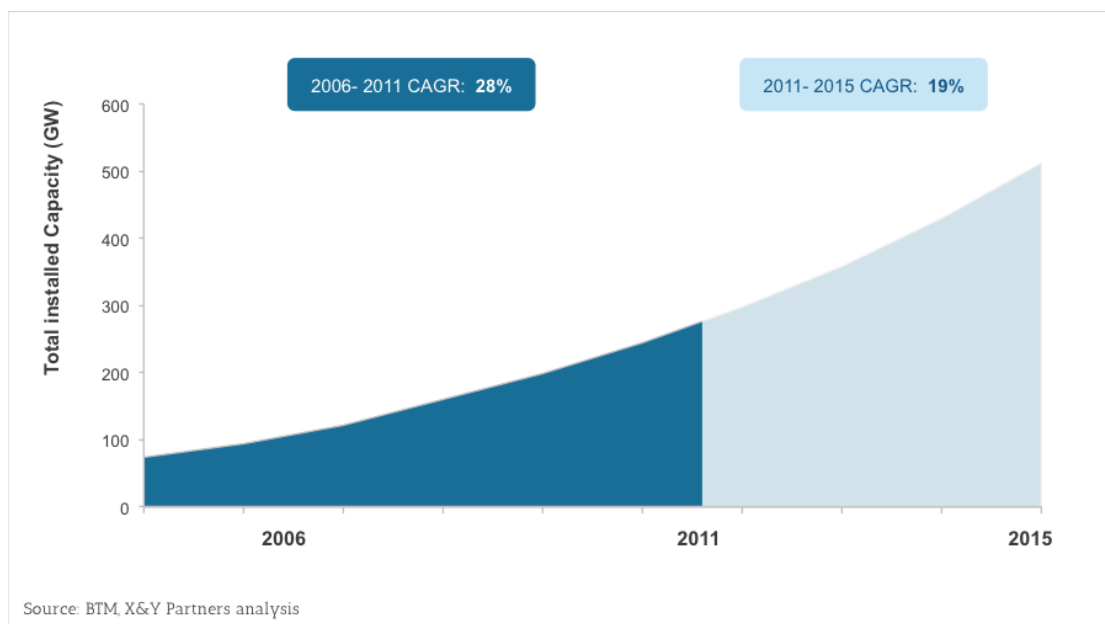


Exhibit 1 - 2006-2015 global wind power installed capacity (GW)

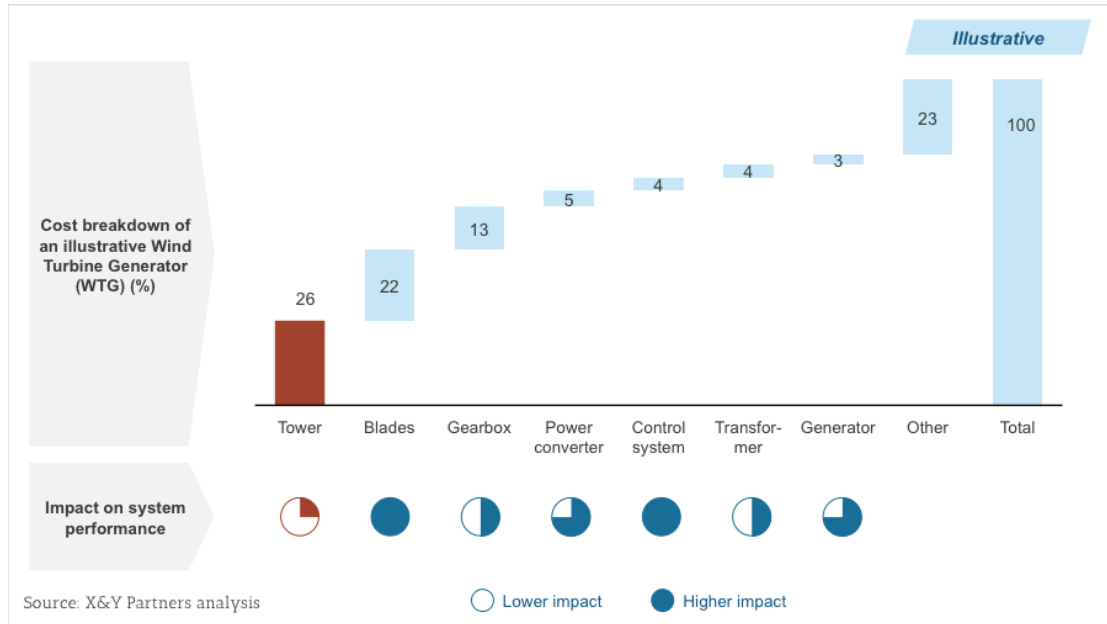


Exhibit 2 - Cost breakdown and impact on system performance for the main components of an illustrative Wind Turbine Generator (WTG).

of alternative materials, particularly concrete, seems to be a viable alternative for cost optimization (Exhibit 3). Two distinct designs are currently commercially available: full concrete designs, developed by companies such as Enercon (a

German turbine manufacturer and systems integrator) and Inneo (a Spanish tower manufacturer); and hybrid systems (which combine a steel tower with a concrete pedestal), developed by companies such as ATS (a Dutch tower manufacturer) and

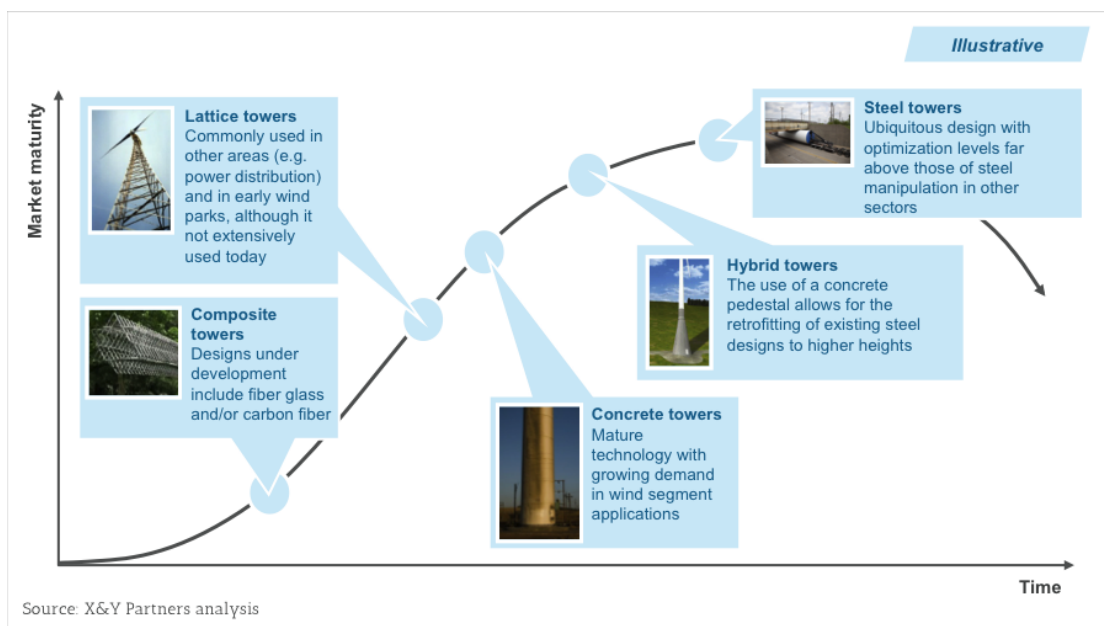


Exhibit 3 - Illustrative industry maturity curve for wind towers.

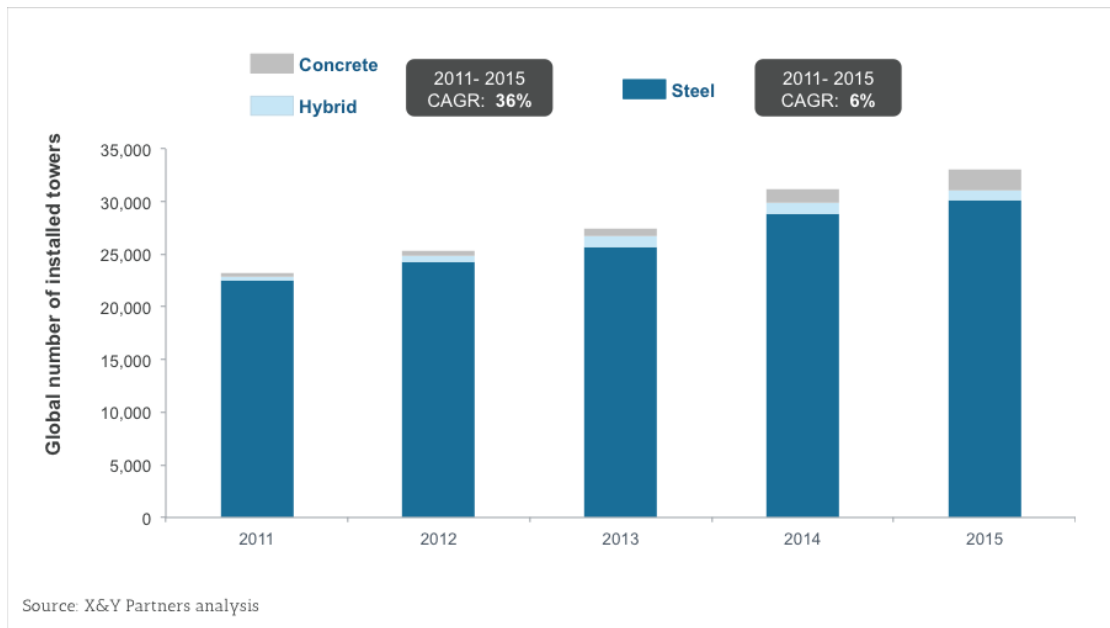


Exhibit 4 - 2011-2015 market share forecasts for steel, hybrid and concrete towers.

Tindall (a US manufacturer of precast concrete products).

Our forecasts suggest a slow but firm introduction of hybrid and concrete towers, resulting in a 2015 market share of 3 and 6%, respectively

(Exhibit 4).

We believe there are three fundamental reasons for this to happen:

Increasingly larger turbines

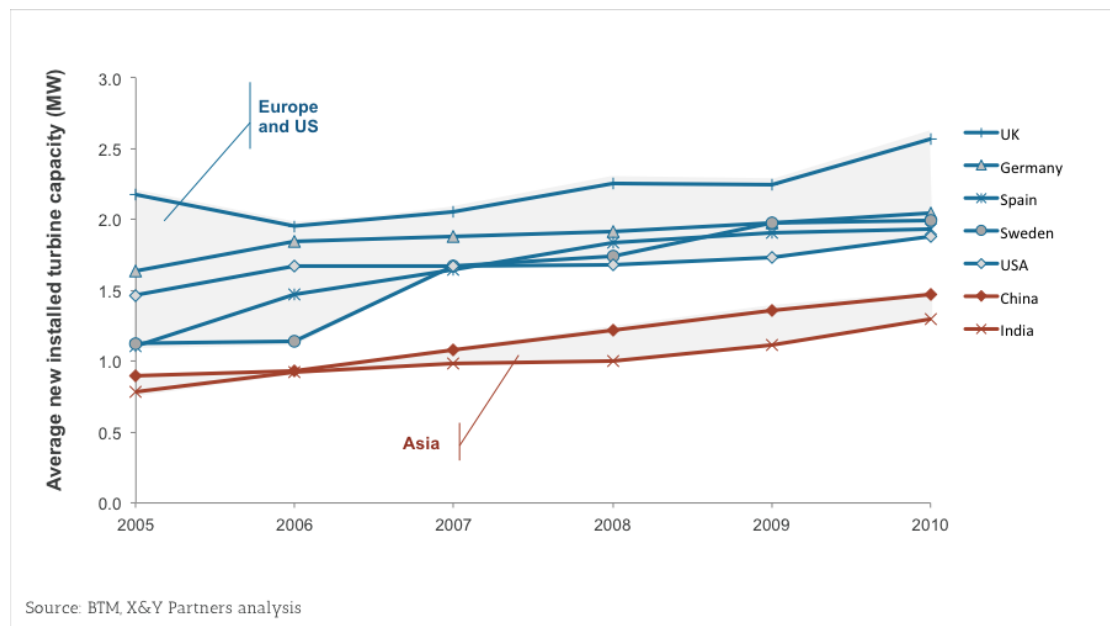


Exhibit 5 - 2005-2010 average new installed turbine capacity per country.

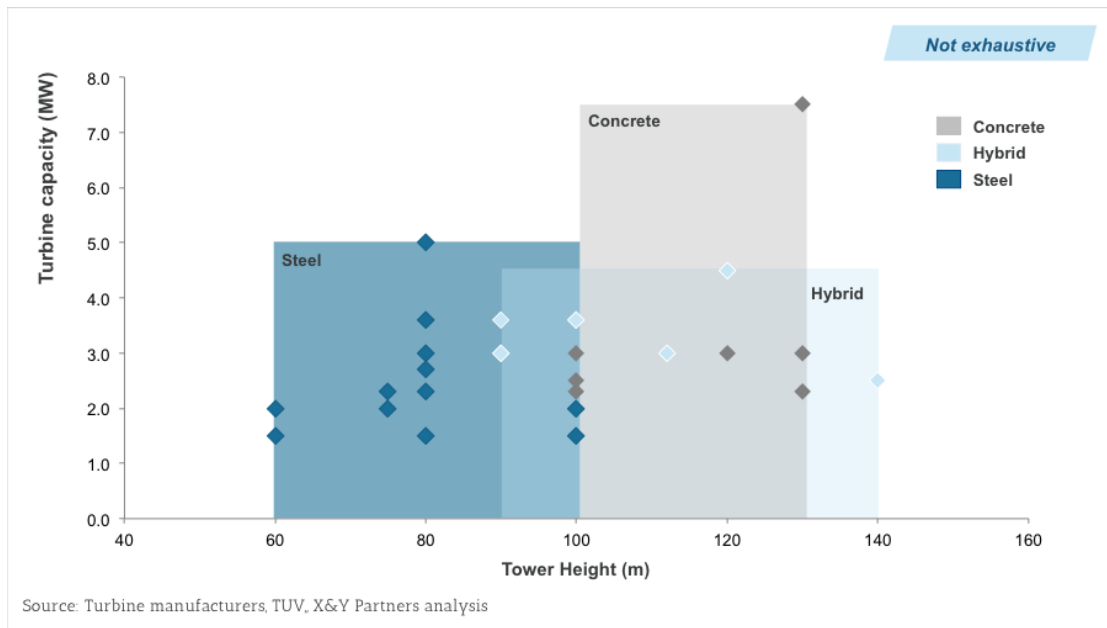


Exhibit 6 - Sample of current offering of turbine-tower combinations.

The average turbine size of new wind parks has steadily increased over the years (Exhibit 5), in an effort to reduce LCoE. Larger turbines are heavier and have larger rotors, requiring taller and more robust towers.

Concrete advocates claim that steel towers are not cost-effective above 90-100m, mainly due to its inherent limitation in tower diameter (tower sections need to be transported by road, limiting its maximum diameter to road width), which creates stiffness

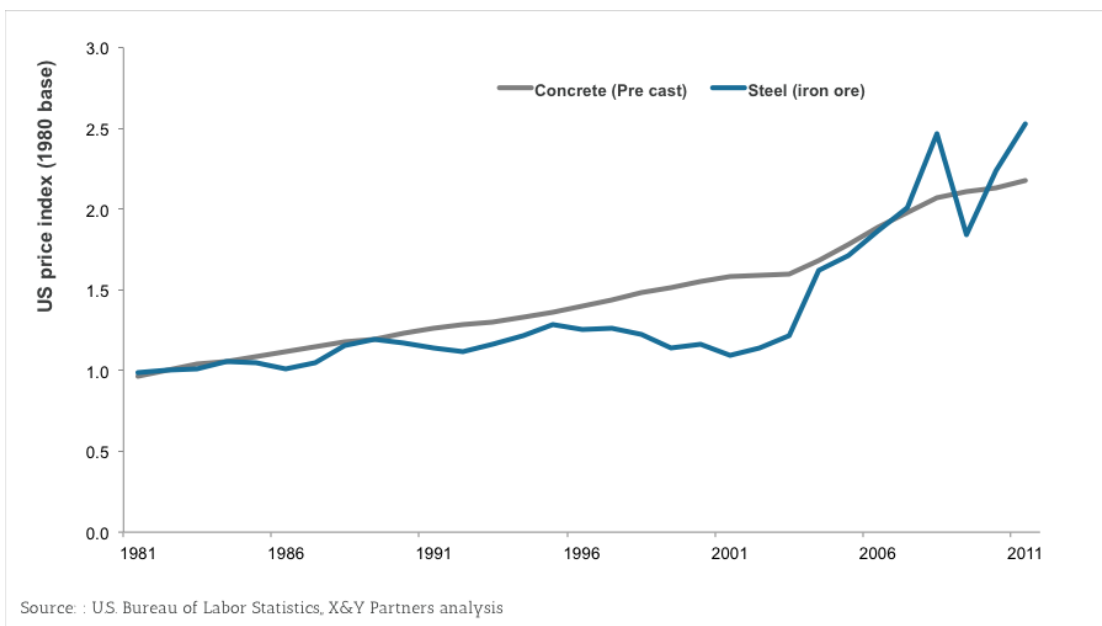


Exhibit 7 - Historical evolution of US iron ore and precast concrete prices.

issues and requires deeper foundations. Concrete does not have this limitation, as larger diameter towers can be built on-site or made up by smaller precast semi-circular sections. A sample of the current offering of turbine-tower combinations seems to corroborate these claims (Exhibit 6).

Steel price volatility

Steel prices have historically been more volatile than concrete prices, particularly in recent years (Exhibit 7), while sourcing in the wind sector is

increasingly dominated by framework agreements and long-term contracts, pressuring companies across the value-chain to favor stability over volatility.

Emergent market growth

While Europe and the US will retain an important role in new wind capacity, emergent markets such as Latin America, Africa and the Middle East are expected to grow at a faster rate (Exhibit 8), assuming an increasingly important role in the global wind sector.

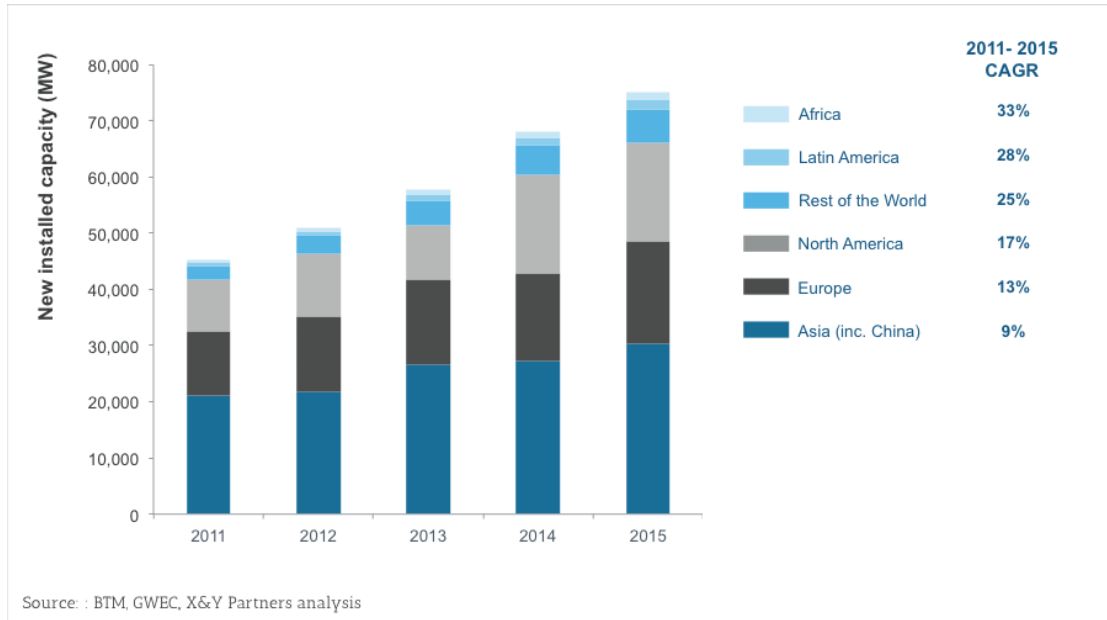


Exhibit 8 - 2011-2015 new installed capacity breakdown per region.

Precast concrete mobile factory in Gujarat, India



Source : Enercon, X&Y Partners analysis

Exhibit 9 - Enercon's precast concrete mobile factory in Gujarat, India.

Remote manufacturing of towers is typically costly, due to high transportation costs, particularly when wind sites are remote or served by poor transportation networks. Furthermore, several emerging markets (e.g. South Africa, Brazil) require a certain percentage of the total wind park value to be manufactured locally. Common practice in the construction sector suggests that good quality concrete is easier to source locally than good quality steel, and requires less specialized manufacturing labor. In fact, companies such as Enercon regularly use precast concrete mobile factories for remote wind parks (Exhibit 9).

On a final note, you might be asking yourself why we predict that in the short-term hybrid towers will have a higher market share than concrete towers. After all, hybrid towers seem more complex to design, manufacture and install. Currently they hold however an important advantage over full concrete designs: the existing overcapacity in steel tower manufacturing (Exhibit 10). Hybrid towers allow for the reuse of existing steel tower designs and manufacturing capacity, which will accelerate its short-term market penetration. In the longer-term, once new turbine-tower combinations reach the market and the steel tower surplus is resolved, we expect full concrete designs to be favored over hybrid designs.

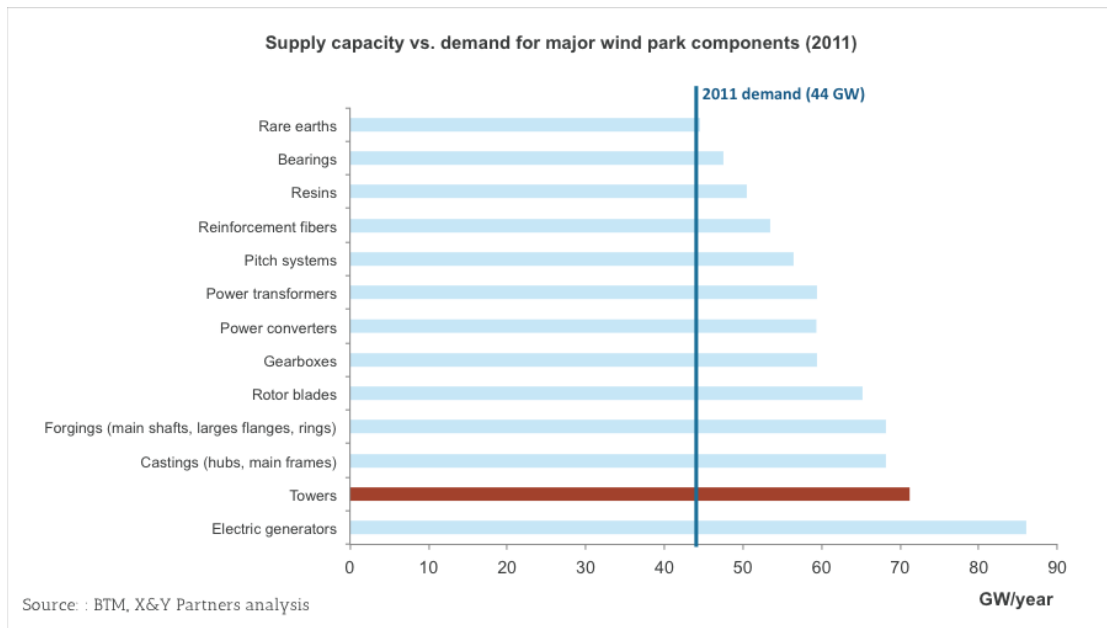


Exhibit 10 - 2011 supply vs. demand capacity for major wind park components.

() LCoE is the price at which electricity needs to be generated to achieve break-even over the lifetime of the project. LCoE*

is a metric commonly used to compare different projects and energy sources.

Tackle climate change with tried and true persuasion techniques

The greater good is a worthy motive to address climate change, but it's not a particularly effective persuasion technique. Routine, reward and social proof work far better.

Simple actions like switching off the lights or turning down the thermostat can lead to substantial savings: studies suggest that behavioral change alone, without any technology update, can result in 5 to 20% carbon emissions savings. The human mind is however far more complex than any machine, and meaningful behavioral

changes in this area have proven difficult.

Our own studies corroborate these findings. For instance, we have recently estimated potential carbon savings purely based on behavioral changes to be 3% for a hospital and 10% for an entire region (Exhibit 1).

Materializing this potential requires convincing the majority of these employees and citizens to change multiple aspects of their daily lives. The standard approach to achieve this is usually to i) appeal to our sense of altruism by showing that conserving

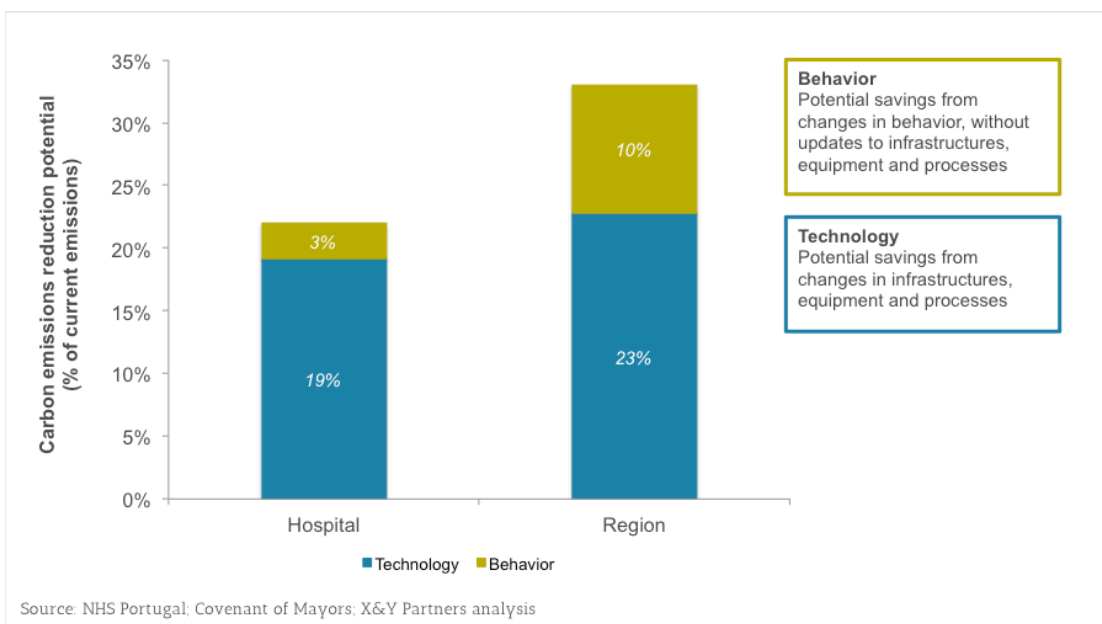


Exhibit 1 - Behavior and technology based carbon emissions savings potential for an illustrative hospital and region.

resources and reducing carbon emissions contributes to the greater good; and ii) provide passive information on how to implement the required changes.

There is nothing fundamentally wrong with this approach: long-lasting behavioral changes should be based on sound values and informed decisions. It can however take years or even generations to implement these changes. In this article we explore three complementary time-proven persuasion mechanisms that can lead to faster results: routine, reward and social proof.

Routine

Most of us are creatures of habits. Sticking to a certain degree of routine

allows us to plan ahead and provides comfort. Complying to existing routines or suggesting alternative ones can, oddly enough, be a very effective behavioral change mechanism.

Successful weight loss programs often exploit this principle: a recent study by the US based National Weight Control Registry shows that 4,000 people that maintained a weight loss of at least 30 pounds (approximately 13,6kg) for more than one year shared a similar daily routine (Exhibit 2).

The application of this mechanism to resource conservation is less prevalent but can be equally effective. Durham Water, an Ontario water utilities, conducted an innovative awareness program: trained students approached lawn owners when they

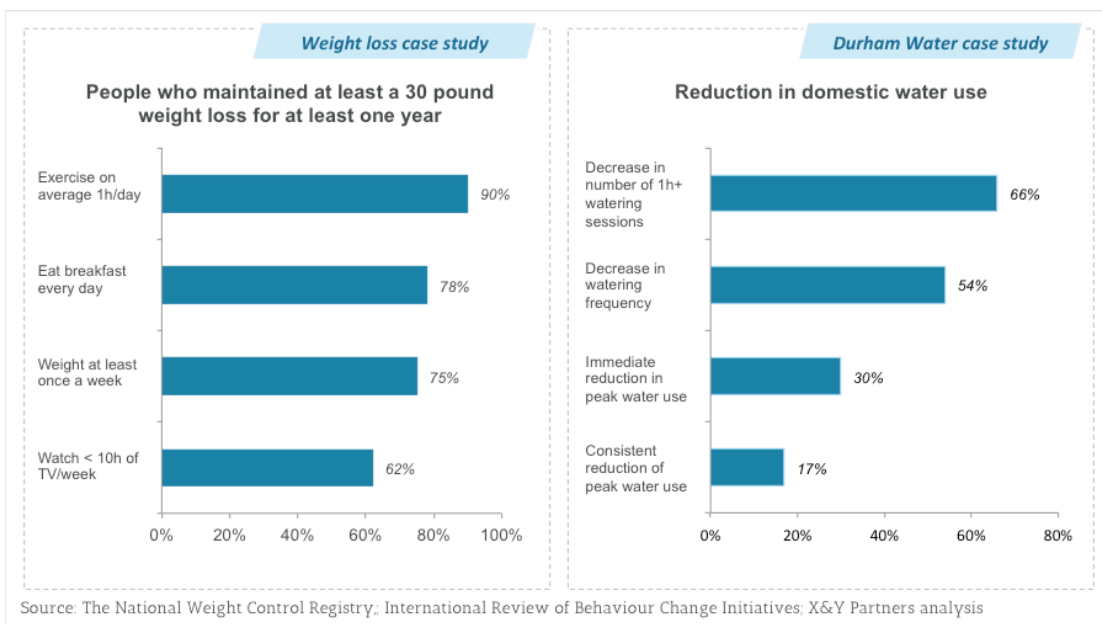


Exhibit 2 - Two examples of leveraging routine - weight loss programs and Durham Water's social experiment.

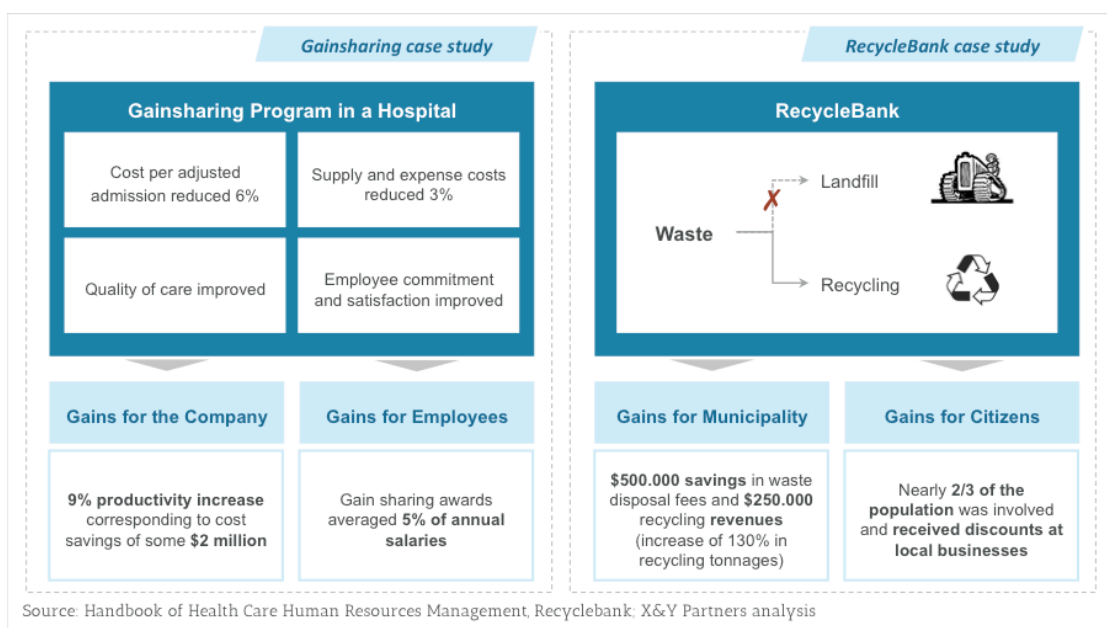
were not busy, explaining them how less frequent watering was beneficial for the lawn. The explanation was complemented by a reminder sign, to be hung next to the water tap, and a gauge, to measure the appropriate amount of watering. Lawn owners were also asked to sign a pledge, committing to less frequent watering. The program resulted in a 17% long-term reduction in water consumption for lawn irrigation (Exhibit 2). In parallel, Durham Water ran a control group, where a separate group of lawn owners merely received an informational brochure. Conversely, this group actually increased water consumption, instead of reducing it.

Reward

Reward, material or not, can also be

an effective persuasion mechanism. Most salary packages, particularly those for executives or sales personnel, include some form of pay-for-performance mechanism. The same principle can also be applied to savings, rewarding employees that find ways to save the company money and resources.

This mechanism, called gainsharing, is often used in the healthcare industry. This study describes how a 375-bed community hospital achieved cost savings of 2,000,000\$ after asking employees to find ways to increase the hospital’s productivity. Employees were rewarded with an average bonus of 5% of their annual salaries, and also reported improved levels of commitment and motivation (Exhibit 3).



Source: Handbook of Health Care Human Resources Management, Recyclebank. X&Y Partners analysis

Exhibit 3 - Two examples of leveraging reward - Gainsharing and RecycleBank.

RecycleBank applies the same principle to communities. The company rewards citizens that recycle more: individual and/or neighborhood bins are regularly weighted, and higher recycling rates are rewarded with points that can be redeemed in local businesses. In Hollywood, Florida, 66% of the citizens adhered to the RecycleBank program, improving recycling tonnages by 130% in the first year. The municipality saved 500.000\$ in waste disposal fees and earned 250.000\$ in recycling revenue. RecycleBank is currently testing the same mechanism for walking and cycling rewards.

Social Proof

People tend to mimic the actions of others, particularly of those they

perceive as being more knowledgeable about a certain topic. This conformity trait is one of the cornerstones of social media, the digital version of the venerable word-of-mouth.

A recent study from U.C. Berkeley shows the influence of Yelp, an online consumer review website, on the success of local restaurants: A step change of half-star in a restaurant's overall rating (the website rounds off ratings to the nearest half-star, so a restaurant that has improved slightly from an average rating of 3.24 to an average rating of 3.26 will be promoted from 3 stars to 3.5 stars) results in a decrease of 8 to 25% in table availability (Exhibit 4). A parallel study from Harvard Business School

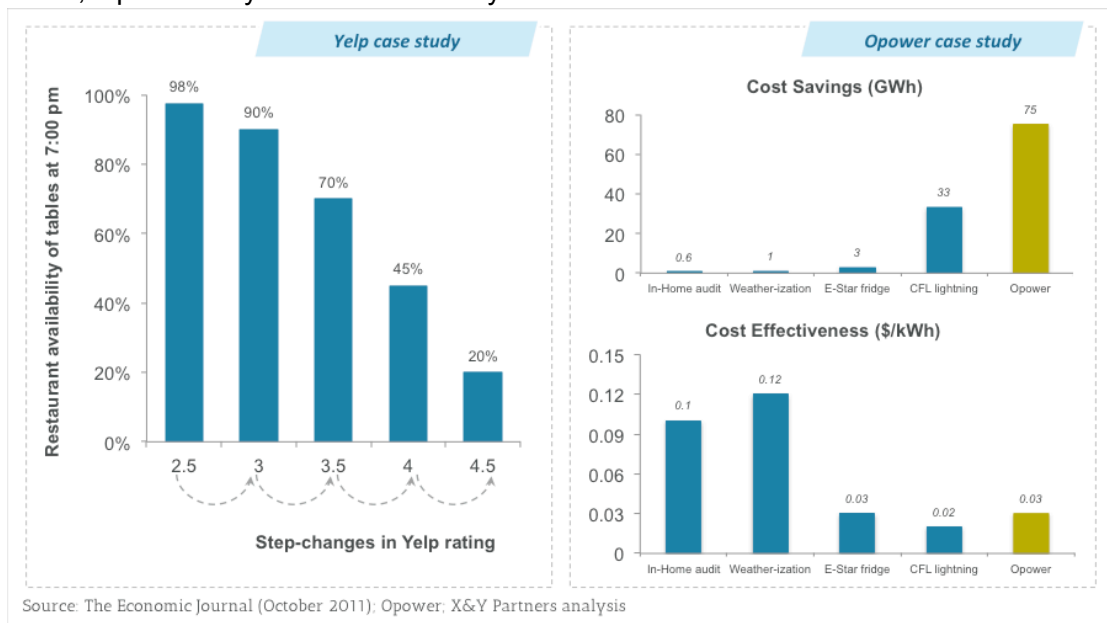


Exhibit 4 - Two examples of leveraging social proof - Yelp and Opower.

concluded that a one-star increase in Yelp rating leads to a 5 to 9% increase in the restaurant's revenue.

Opower brings the technique of social proofing to energy savings. The company partners with electric utilities to offer customers additional insight about their energy bills, including a comparison with more efficiency households from the same neighborhood, complete with personalized tips on how to achieve similar results. Opower reports average savings of 1.5 to 3.5%, with a better cost-effectiveness than some of the more traditional energy efficiency initiatives (Exhibit 4).

You will notice that most of these examples leverage more than one of these persuasion techniques. Opower, for instance, complies with customer routines by coupling its service to existing monthly energy bills. In

addition it offers a tangible reward: reduced energy costs. RecycleBank's service likewise does not require any substantial change in routines, as customers continue to use existing recycle bins. It has also added a social proofing aspect to its business model, prompting neighborhoods to work together and leveraging social media for word-of-mouth.

In conclusion, routine, rewarded and social proof have proven to be effective behavioral change mechanisms in a variety of areas. Applying them to areas such as climate change and sustainable development, which traditionally rely on an appeal to the greater good and on passively providing information, can help to provide more immediate results.

Performance contracts make sense for more than just energy

Performance contracts are popular among ESCOs (Energy Service Companies), but they should also be used in other areas

If you want to reduce energy costs but cannot afford the required equipment upgrades, you'll likely find an ESCO (Energy Service Company) willing to install everything for free, in exchange for part of the future savings. But if your company is services based, most likely the bulk of the costs are in human resources and in the supply chain, not in energy. Applying the

same ESCO model to these areas can thus make a lot of sense.

The Portuguese NHS (National Health System) recently asked us to assist them in preparing the 2020 Carbon Reduction Strategy for their public healthcare network. The objective of this work was twofold: on the one hand, it should address the sectoral carbon emissions legislations that are being put in place across Europe; on the other hand, it should contribute to reduce the 8.000+ Million Euro budget required to run this network of more than 70 hospitals and 340 primary care centers.

1	Green purchasing implementation processes and systems	13B	Use of more efficient lighting technologies
2	Optimizing medical consumables utilization	14	Optimizing the use of electrical equipment
3	Optimizing administrative consumables utilization	15	Staff training and awareness for resource reduction and optimization
4	Optimization of Stock Management	16	Hardware and software efficiency improvement
5	Reducing meals environmental impact	17	Targets follow-up procedure creation
6	Cogeneration / trigeneration installation and operation	17	Targets follow-up procedure implementation
7	Use of renewable energy to produce thermal energy	18	Processes dematerialization
8	Use of renewable energy for electricity generation	19	Biomedical waste reduction and triage optimization
9	Optimization of electric bills	19	Urban waste reduction and triage optimization
10	Improving buildings thermal efficiency	20	Water collection and reuse
11A	Improving climate control systems	21	Water consumption reduction
11B	Improvements to existing HVAC systems	22	Staff commuting optimization
11C	Replacement of existing HVAC systems for more efficient technologies	23	Business travel and equipment transport optimization
11D	Improvements to existing ventilation systems	24	Patients transport optimization between health care units
12	Passive ventilation systems adoption	25	Patient's own vehicle use reduction
13A	Lighting control systems improvement	26	Complementary Diagnostic and Therapeutic Exams request optimization and capacity maximization

Supply chain
Energy
Operations
Waste & Water
Transport
Patients

Source: X&Y Partners

Exhibit 1 - Considered carbon and cost reduction initiatives.

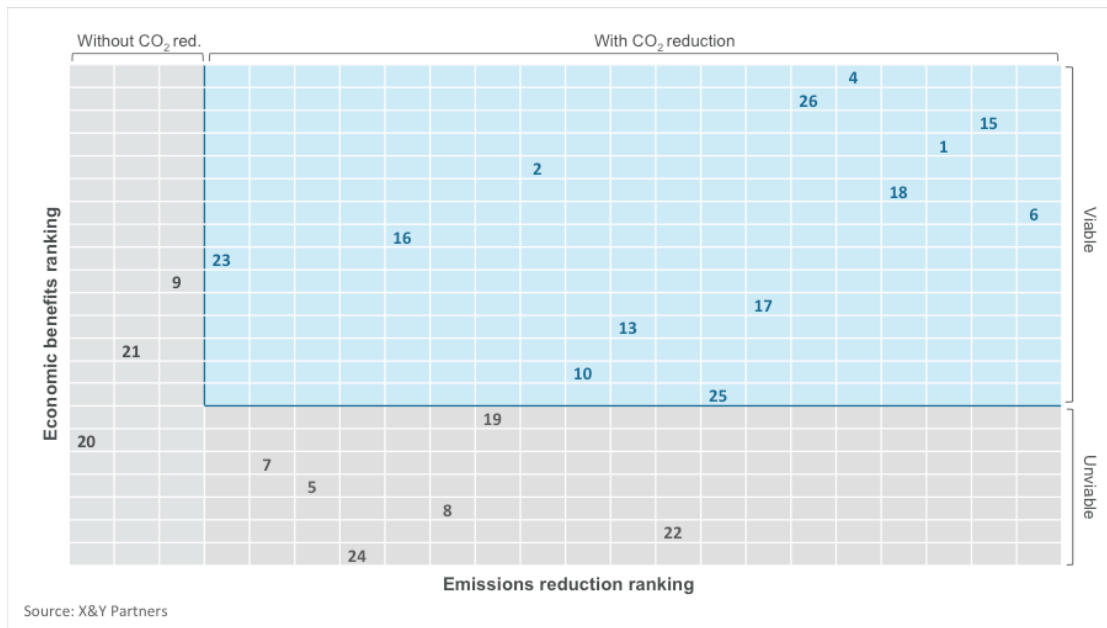


Exhibit 2 - Correlation between environmental and economical benefits, for an illustrative hospital.

The two objectives are closer than one might think. Of the 26 initiatives analyzed (Exhibit 1), half of them result in carbon reductions and are economically feasible (Exhibit 2).

The other interesting conclusion is that most of the carbon and cost savings potential is not in energy, but in supply chain management and operations. In the two hospitals and one primary care center that we analyzed, energy

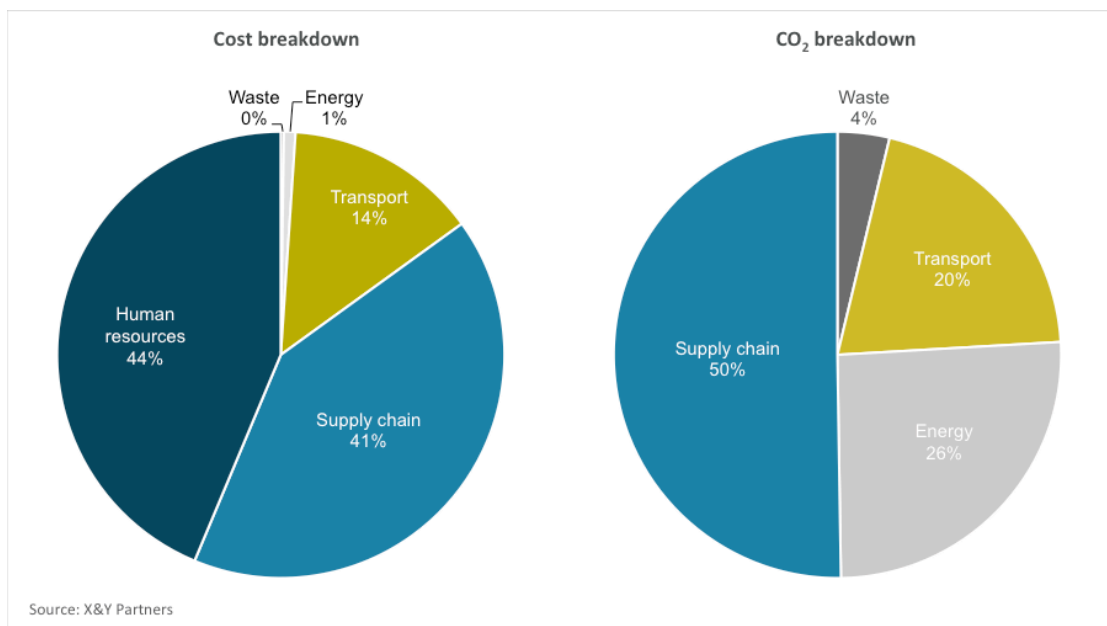


Exhibit 3 - Cost and carbon footprint breakdown.

represented only 26% of the total carbon footprint and 1% of the total budget, while supply chain activities and human resources took more than 50% of the carbon footprint and 85% of the budget (Exhibit 3).

Most of the carbon/cost saving initiatives that can be applied to these areas are based on lean practices that are already common in manufacturing but less so in services, such as smart procurement, Kanban stock management and just-in-time workflows. And, similarly to what already happens with energy efficiency initiatives, the investment required to implement these practices could be financed through a performance contract. Let's take an example:

Installing a Kanban stock management system in a 600 bed hospital will require an initial investment of approximately 2.2M€. These systems typically lead to a measurable decrease in purchasing of at least 10%, or 1.75M€/year for this example. An investor that takes 25% of these savings for 10 years will thus make a ROI (Return on Investment) of 35% (7% discount rate), which is in line with what ESCOs typically make.

Besides healthcare, the same model can be applied to other sectors with high procurement and/or human resources costs, such as retail, tourism & travel, telecommunications or the public sector.

Should you buy an electric car?

Yes, but probably not just yet. The latest iterations of the venerable internal combustion engine are still competitive, both from an environmental and an economical standpoint.

The forecasts for global electric vehicle (eV) sales are undoubtedly ambitious – 2 million vehicles sold by 2020 – which reflects the high hopes that both manufacturers and governments are placing on this technology. So far, actual sales have been somewhat lackluster: in 2011 approximately 44,000 electric vehicles were sold, instead of the expected

66,000 units (Exhibit 1). It is not yet an immense difference, but it does raise some questions about the feasibility of the 2020 goal. In this scenario, should you, as a consumer or someone responsible for a company car fleet, buy an electric car?

Most industry analysts agree that, with the advent of cheaper and more reliable batteries (currently the main issue for this type of vehicles), the market will take off. It is however not clear when this will happen, as the technological roadmap for the next few years is still relatively uncertain.

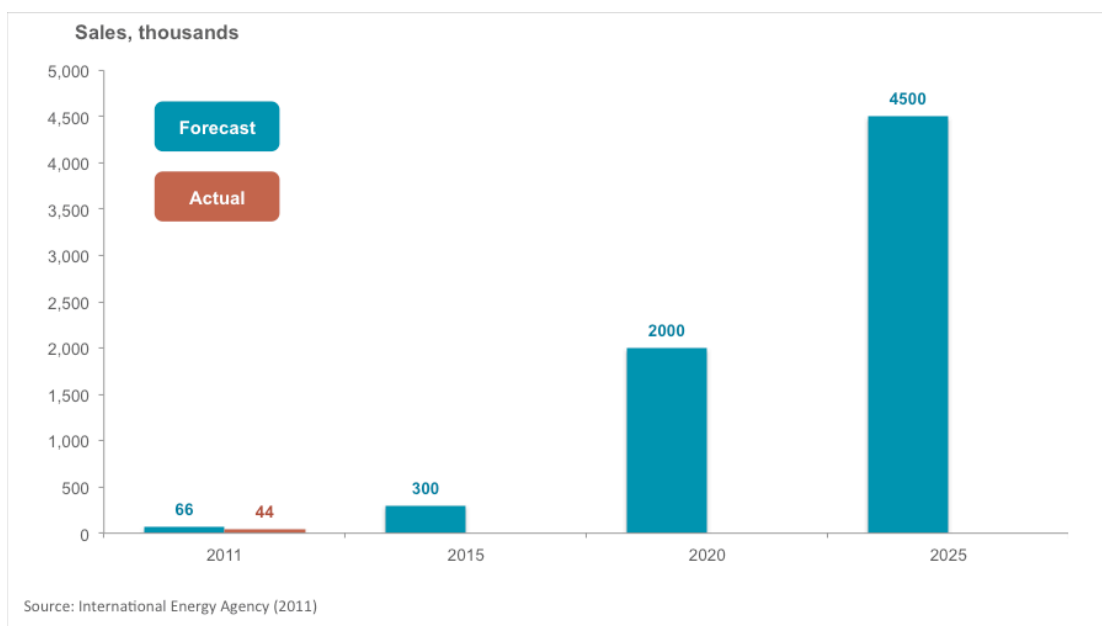


Exhibit 1 - Global electric vehicle sales forecast for 2010 – 2025 (excludes electric scooters and bicycles).

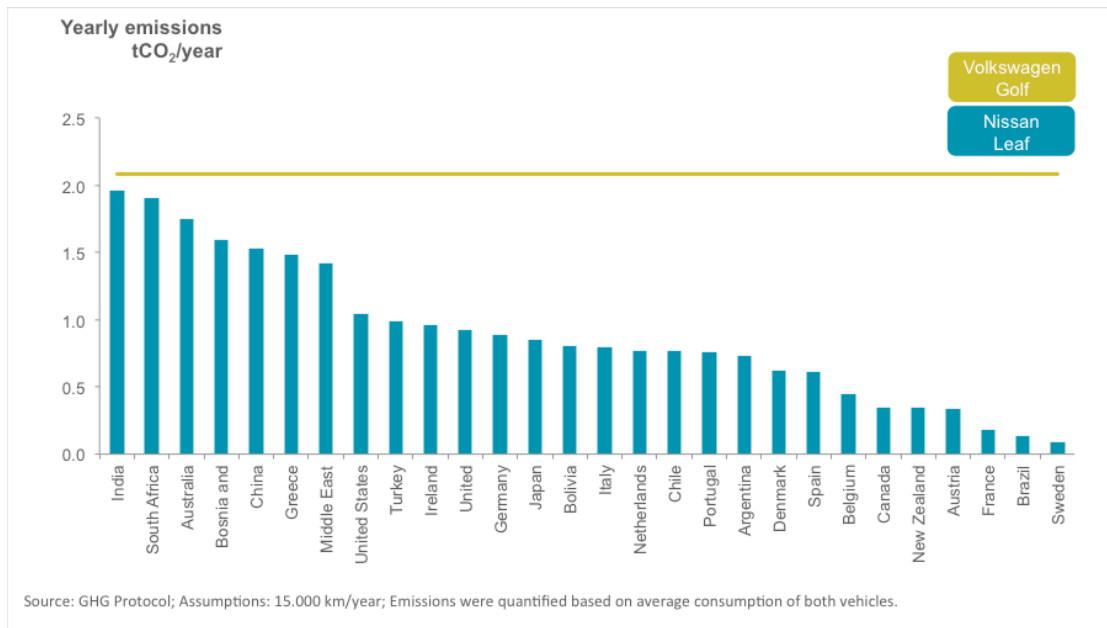


Exhibit 2 - Comparison between the carbon footprint of a Volkswagen Golf 2.0 Diesel and a Nissan Leaf, for several countries.

So, given time, most of us will probably be driving electric cars. But what about right now? When is an electric vehicle an immediate viable option? That was exactly the question that one of our clients, a leading European fleet management company, asked us.

From an environmental standpoint, the electric car seems hard to beat: Exhibit 2 shows how the carbon footprint of a Nissan Leaf (currently the most sold eV in Europe) compares with that of a Volkswagen Golf 2.0 Diesel (currently the most sold car in Europe). Although that may not be true for all vehicles and all countries, in this particular example the electric vehicle is always the greenest option, irrespectively of the country’s electricity mix (unlike a

conventional car, an electric car will emit less in a country that gets most of its electricity from renewable or nuclear sources – e.g. France – and will emit more in a country that is more dependent on fossil fuels – e.g. United Kingdom).

From an economical standpoint however, the answer is not as clear. The evolution of the internal combustion engine is far from over, as illustrated by the 21% fuel consumption difference between the Volkswagen Golf and the BMW Series 1, a competing offer for the same segment (Exhibit 3).

Besides fuel and maintenance costs, there are two other important factors that influence Total Ownership Costs (TCO): retail price and residual value

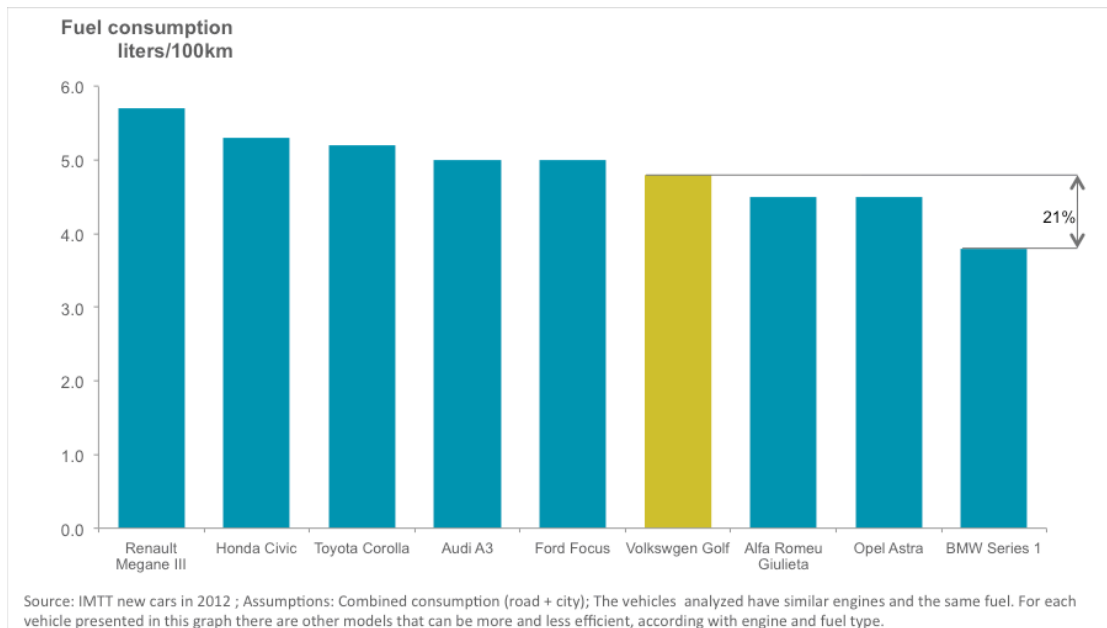


Exhibit 3 - Fuel consumption for eight vehicles in the same segment as the Volkswagen Golf.

(i.e. by how much you can buy the car at the end of the leasing period). These costs can vary significantly from country to country, so Exhibit 4 shows the TCO calculation for two different European countries: Germany, which expects strong short-term eV sales, and Portugal, which has ambitious

plans for the deployment of a broad network of eV charging points.

In both countries, the electric vehicle is the most expensive option, mainly because of its low residual value: the Nissan Leaf's batteries are warranted for a period of 5 years, which means that the second-hand market value of

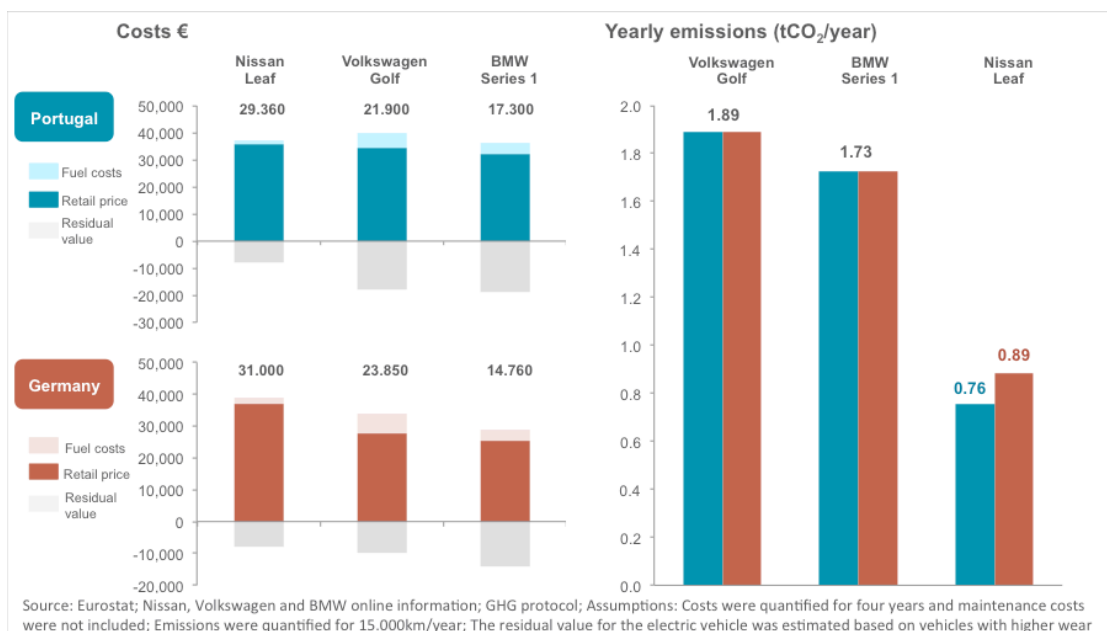


Exhibit 4 - Environmental and economical cost comparison for the Nissan Leaf, Volkswagen Golf and BWM Series 1, for Portugal and Germany.

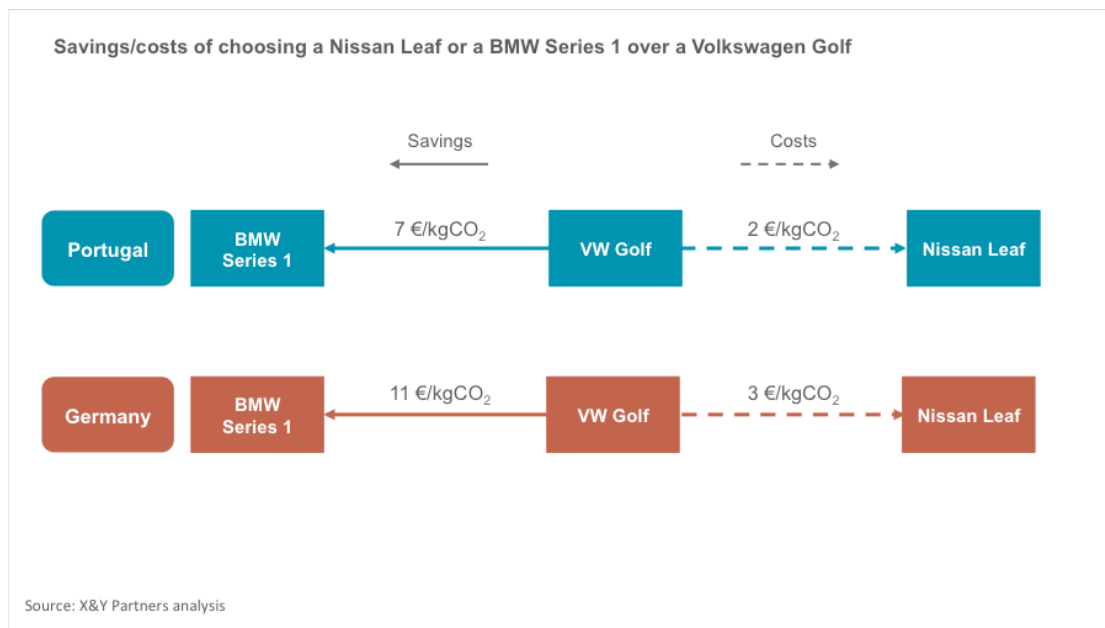


Exhibit 5 - Savings/costs of choosing a Nissan Leaf or a BMW Series 1 over Volkswagen Golf.

these vehicles will likely be severely impacted by the risk of facing battery issues beyond that warranty period.

Another interesting conclusion is that, for these countries, the BMW Series 1 is a more affordable option than the Volkswagen Golf, the current sales leader. This is both true from an economical standpoint (TCO is 20% lower in Portugal and 35% lower in Germany) and from an environmental standpoint (carbon emissions are 9% lower).

Exhibit 5 summarizes these conclusions: for these countries, buying a Nissan Leaf instead of a Volkswagen Golf means paying a premium of 2-3€ per kgCO₂ avoided.

But buying a BMW Series 1 instead of a Volkswagen Golf actually saves 7-11€ per kgCO₂ avoided.

Does this mean that buying a more efficient conventional vehicle is always a better option than buying an electric car? Certainly not, as results will vary from country to country and segment to segment. It does however hint at a conclusion that is both valuable for our fleet management client and consumers in general: electric cars may be the best option from a purely environmental standpoint, but the new generation of highly efficient conventional cars are probably a better compromise between environmental impact and cost savings.

Lessons learned from market forecasting

Forecasting is about the journey, not the destination: what you learn in the process will be more useful than the forecast itself.

We are often asked to make market forecasts, so we decided to go back to some of our older forecasts and see how well we fared. We found that most forecasts had a fair 15-20% deviation from the actual figures (Exhibit 1). There were however outliers: on the one hand, we overestimated the global installed capacity of wave energy by an order of magnitude (a case we discussed previously here), while on the other hand we predicted the evolution of wind energy costs inside a

5% margin. In any case, the real value of forecasting is what you learn in the process, as it forces you to understand and quantify the forces that shape a particular market. In this article we share four lessons learned while making market predictions and forecasts.

1. Do not average forecasts

It is tempting to take forecasts from different sources and average the results. It is also risky, because: i) different forecasts will likely be based on different premises; and ii) forecasts are often biased (for instance, an industry association promoting a particular renewable energy will likely be optimistic about installed capacity

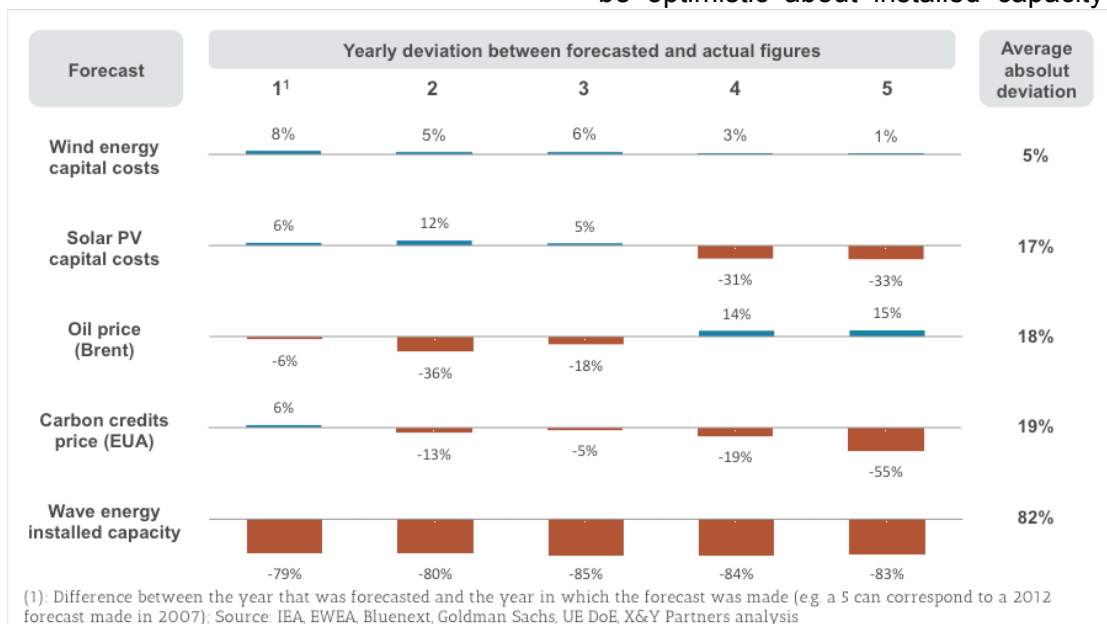


Exhibit 1 - Comparison of several 5-year forecasts with actual market data.

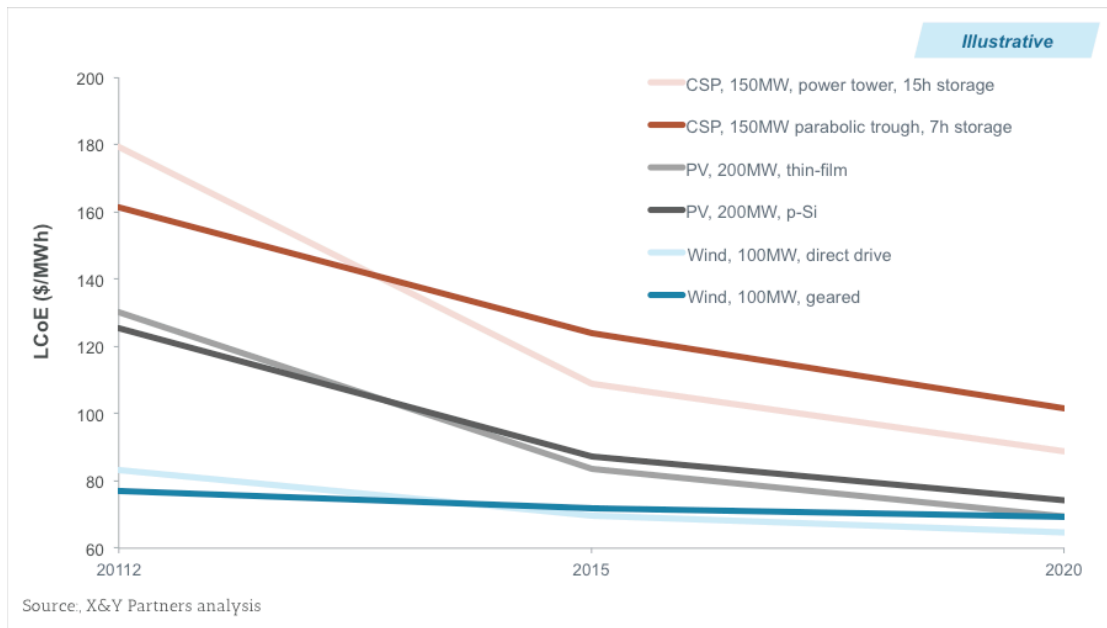


Exhibit 2 - Example of a Delphi method applied to estimating the LCoE of several PV, CSP and wind energy specific plant configurations.

forecasts and potential cost reductions).

A better alternative is to use a Delphi method, a process that shares roots with prediction markets and other crowd wisdom techniques. In a Delphi, a group of experts is asked to individually answer a question (e.g. what will be the cost of solar energy in 2015?). The answers and assumptions of the experts are then discussed and compared, and each of the experts makes a second prediction. This second prediction is also made individually, but now the expert is able

to leverage the new information he gained from the other experts. The process is iterative and usually runs until the moderator is satisfied that the answers share the same premises and are bias-free.

Exhibit 2 illustrates the results of a Delphi method we recently used to gather the inputs necessary to calculate the evolution of the LCoE (Levelized Cost of Energy) in the Middle East for several renewable energy configurations.

2. Make a sanity check

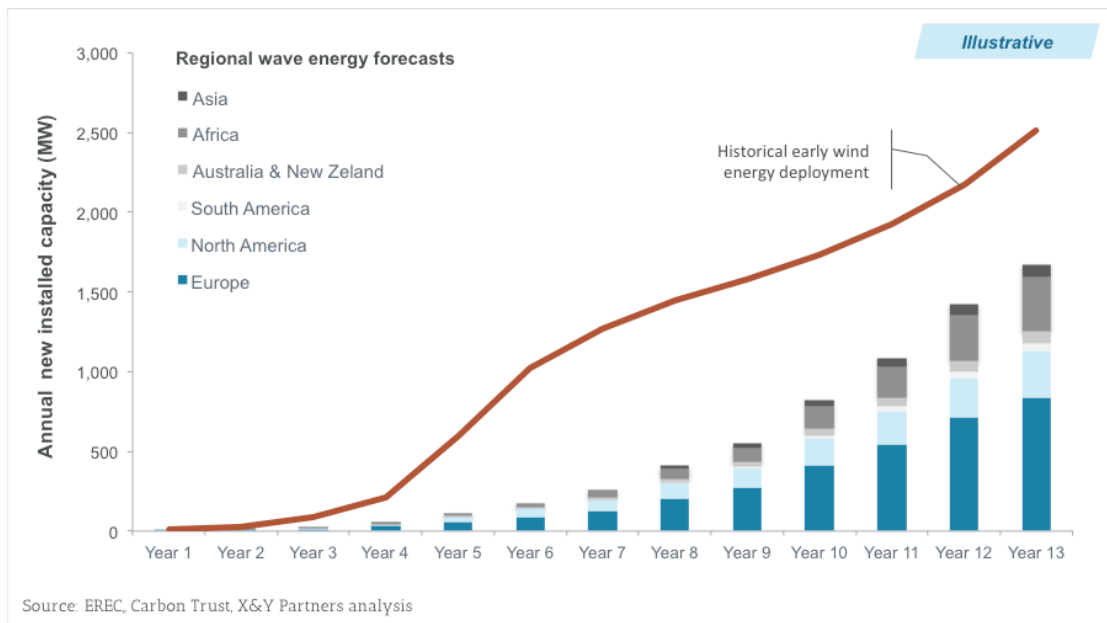


Exhibit 3 - Example of using the historical early wind energy deployment as a sanity check for a bottom-up forecast for wave energy deployment.

History is a poor indicator of what will happen in the future, so forecasts are inherently inaccurate. They can however be made more precise by combining different estimation methods, or by running a sanity check to confirm that the final figure is

coherent. This will not guarantee better results (only a crystal ball would do that) but will help to identify flaws in logic, unrealistic assumptions and inaccurate data.

As an example, Exhibit 3 compares a

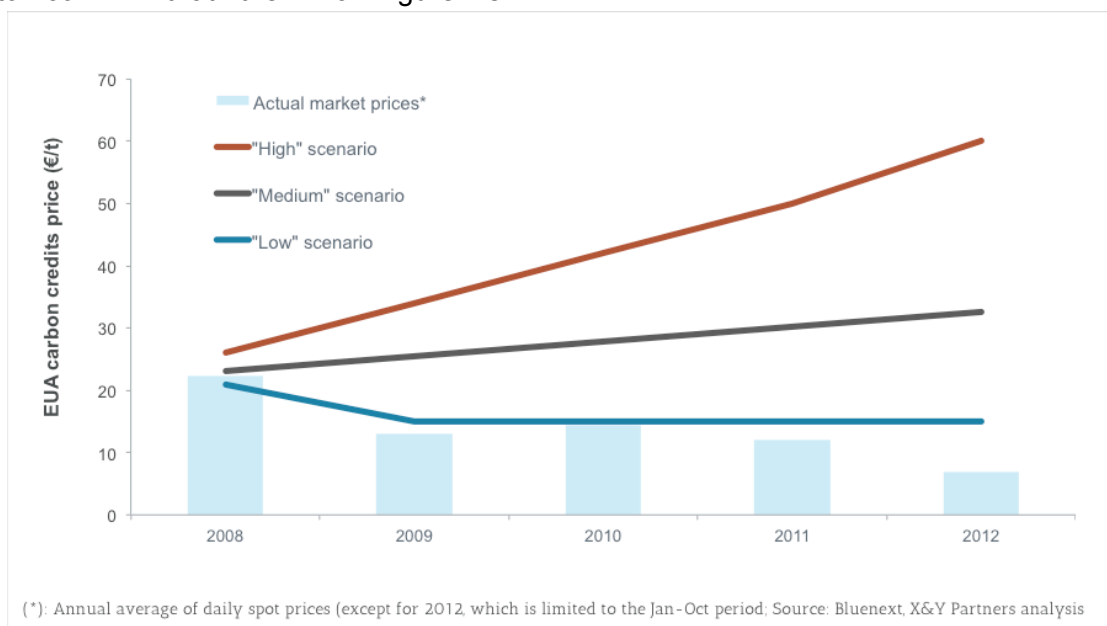


Exhibit 4 - Comparison of three scenarios for the evolution of carbon credit prices with the actual market prices.

bottom-up forecast for wave energy deployment (made by summing up individual regional forecasts) with the historical early wind energy deployment. Benchmarking forecasts against historical data from other sectors is a good way to quickly spot unrealistic assumptions, and to keep in check compounded errors that often affect bottom-up estimates.

3. Build scenarios

Forecasts should not be a single data point or curve, but rather a collection of scenarios. Building scenarios will do little against black swan events (a term coined by Nassim Taleb to describe rare and unpredictable events with extreme impacts), but will help you understand the impact of foreseeable events with several distinct outcomes.

Exhibit 4 illustrates three scenarios for the forecast of EUA (European Union Allowance) carbon credits prices. The ‘High’ scenario assumed that the Kyoto Protocol was followed by a global agreement, the ‘Medium’ scenario was based on an extension of the Kyoto Protocol, and the ‘Low’ scenario assumed no significant agreement between the parties was reached.

4. Run a sensitivity analysis

Even in the absence of foreseeable events that can dramatically change the direction of a forecast, there are usually a few key parameters that can cause sizeable variations in the predictions. Running a sensitivity analysis on these parameters is thus a sound idea. Pool power prices, for

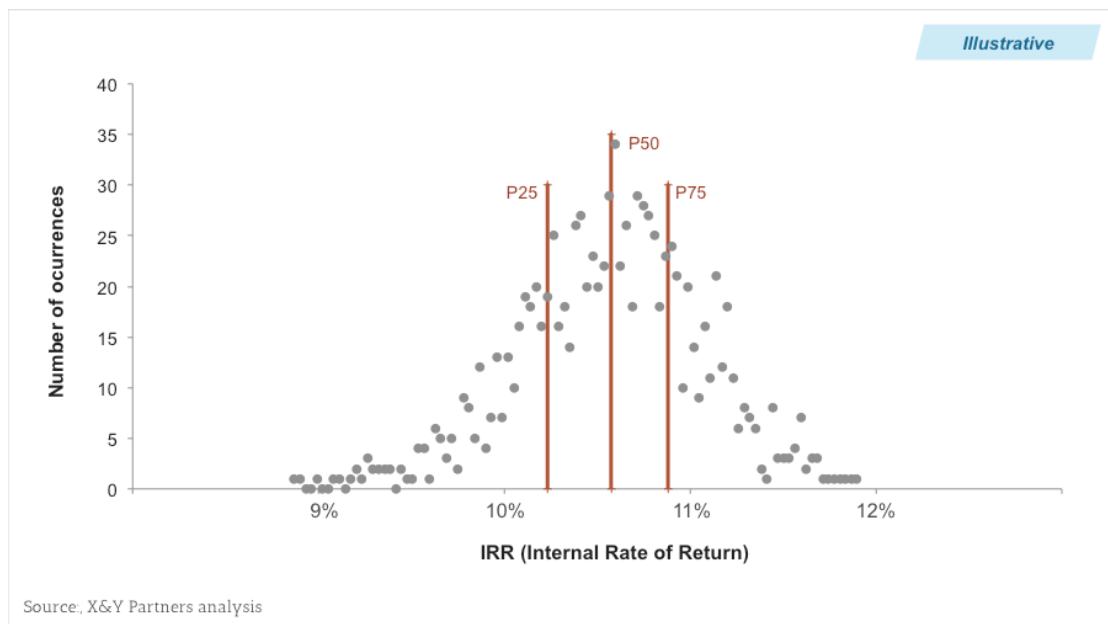


Exhibit 5 - Example of a Monte-Carlo simulation applied to the valuation of a CSP plant.

instance, depend on the prices of the various power sources, and on factors such as rainfall and wind (since more rain means more hydroelectric power and more wind means more wind power).

For forecasts that depend on several key parameters, it may be worthwhile to run a Monte-Carlo simulation, a method that tests the impact of simultaneous changes in multiple

inputs. Exhibit 5 illustrates the application of a Monte-Carlo simulation to the valuation of a CSP (Concentrated Solar Power) plant. The simulation showed that the compounded effect of small changes in key parameters (such as energy yield, pool price, capital expenditure and interest rate swap rates) could have a meaningful impact on investor returns.

Ask for feedback like you mean it

Feedback has been coined as a buzzword. It is undeserved: asking for help and actually listening to the resulting opinions is uncomfortable but very useful.

There are sentences that stick to your mind, like gum. In my case, one of these is about feedback. It all goes back to the days of my MBA. At the end of a group project that had gone wrong from the start, we decided to organize a round of feedback to understand what had happened. One of my colleagues didn't hold anything back: she told the rest of us, eyes in eyes, where we had failed and how we should improve. She finalized by saying that "feedback is a gift that I give you, you can decide to accept or reject it".

Feedback is a tricky thing. We know that we should ask for it, but sometimes we don't. We know that we should take it into consideration, but we rarely do. Taking feedback into account usually means putting more work into something we already dedicated a lot of time, effort and care to. It forces us to reopen a task we had assumed was already closed. This

article from Harvard Business Review recommends to "think carefully and consciously about whether we really want feedback, and why" and "when we do ask for feedback, be prepared to seriously consider it".

With this in mind, a few months ago we decided to ask for feedback about X&Y's rebranding. This is what we learned in the process:

1. Get the timing right

Ask for feedback too early in the process and you'll have nothing concrete to ask feedback about. Wait too long and you will not be able to take feedback into account. In our case, we decided to have two feedback rounds: a first one, small and limited to discussing a few key objectives and ideas, and a broader session, once we had a draft version of our new positioning, brand, website and content.

2. Leverage your network

Chances are that you know a lot of smart people: friends, colleagues, clients, suppliers, business partners. These people care about you and are likely familiar with the issue at hand.

Feedback is an opportunity to get free advice from talented individuals.

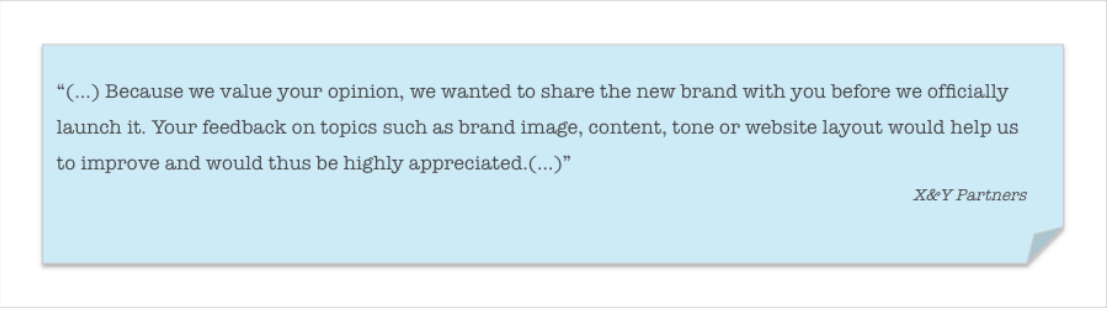
3. Don't mix feedback with promotion

You are asking for advice, not pitching an idea. Only ask feedback from people that you realistically think can help you with the issue at hands, and do it in a clear, concise and neutral tone (Exhibit 1).

Nevertheless, a follow-up call or a gentle reminder is always a good idea (Exhibit 2), as it can greatly improve response rates.

5. Discard the compliments and discuss the criticisms

It is great to hear compliments, but that is not what you are looking for. You are looking for what needs to be improved, and how it can be improved.



"(...) Because we value your opinion, we wanted to share the new brand with you before we officially launch it. Your feedback on topics such as brand image, content, tone or website layout would help us to improve and would thus be highly appreciated.(...)"

X&Y Partners

Exhibit 1 - Excerpt of the email sent asking for feedback on X&Y's rebranding.

4. Don't be discouraged by the lack of responses

Chances are that most of the people you contact will not respond. In our case, we asked feedback to 178 persons, and got back 20 responses. Don't take it personally: smart people are usually very busy, and you're asking them for a favor that requires time and does not bring them any immediate benefit.

Hernan, a Professor at Insead, liked the website but had doubts about the whole positioning. We got back to him to further discuss his concerns and possible solutions (Exhibit 3).

6. Don't be defensive

Criticisms are hard to hear, and you will feel an urge to defend your ideas. Don't do it: you should be looking for refreshing perspectives and alternative solutions, not trying to convince everybody that you are right.

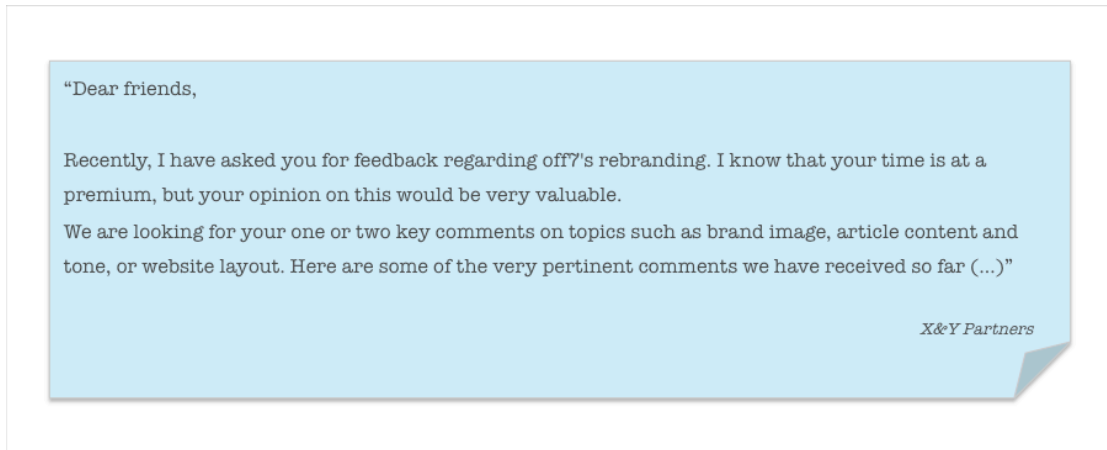


Exhibit 2 - Excerpt of the “Gentle reminder” email sent, following the first email, asking for feedback on X&Y’s rebranding.

Kevin, an alumnus from Insead, and Rui, an Associate at Deutsche Bank, thought that we were not adequately leveraging our experience. They were right: our original idea of forgoing a traditional reference list in favor of articles that showcased our knowhow was not working, and the addition of a reference list and more detailed profiles proved to be very beneficial.

Michael, a Principal at Arthur D. Little, noted that we were refreshingly open about being a small company, but also claimed to be able to quickly deploy a team anywhere in the world. Michael put the finger in an issue that affects many small management consulting firms: the effort to show enthusiasm often ends in overly bold claims. As a result, we rewrote the “About us”



Exhibit 3 - Excerpt of a series of emails exchanged with a Professor from Insead regarding some of the issues he raised on his feedback.

section, which now favors unpretentiousness over boldness.

7. Don't try to please everybody

Not trying to please everybody is as important as not being defensive. Taking every piece of feedback into account will likely distort your original idea into something that is no longer your idea.

For instance, we received several criticisms regarding our "Straight answers for emerging issues" motto. Hernan, a Professor at Insead, said that the word "emerging" was vague and over-used. Theo, a Director from DSM, added that "it did not ring a bell".

Despite understanding where these arguments come from, and even agreeing with them to some extent, we still believed that this catchphrase accurately summarized what we wanted to achieve with the rebranding, so we decided to keep it.

8. Say thank you and return the favor

Feedback can indeed be an amazing gift. It goes without saying that, besides thanking your contributors for the time and effort they dedicated to help you, you should be attentive to opportunities to return the favor.

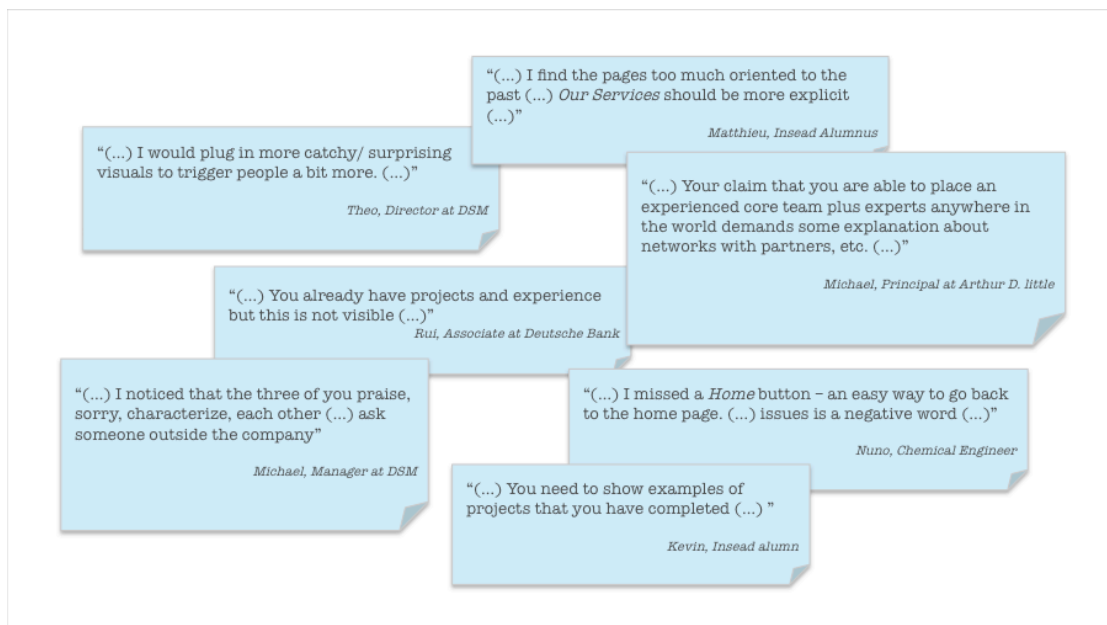


Exhibit 4 - Excerpts of feedback received..

Going beyond "productization"

A personal example of how creating an actual product, instead of merely packaging services into a product, can make a lot of sense.

Productization, or turning services into products, has been a big trend among professional services companies, and for good reason: clients get a more tangible offer and companies get to systematize and reuse their previous work. But what about making an actual, physical product? We did it, and maybe you should too.

We at X&Y often productize our services. In fact, we call them "solutions" to emphasize the results of the service, instead of the service

itself. While these solutions pack more than just our time (e.g. proprietary tools and data) the output is usually the same as a service. With one exception: Carbon Analytics is an actual material product.

Carbon Analytics is a real-time carbon emissions monitoring and analysis system. It uses measuring hardware (e.g. energy consumption meters, GPS tracking devices) and business intelligence software to measure and analyze in real-time the carbon footprint of an entire company, automatically reporting the results and suggesting ways to improve them (Exhibit 1).

Carbon Analytics was born out of

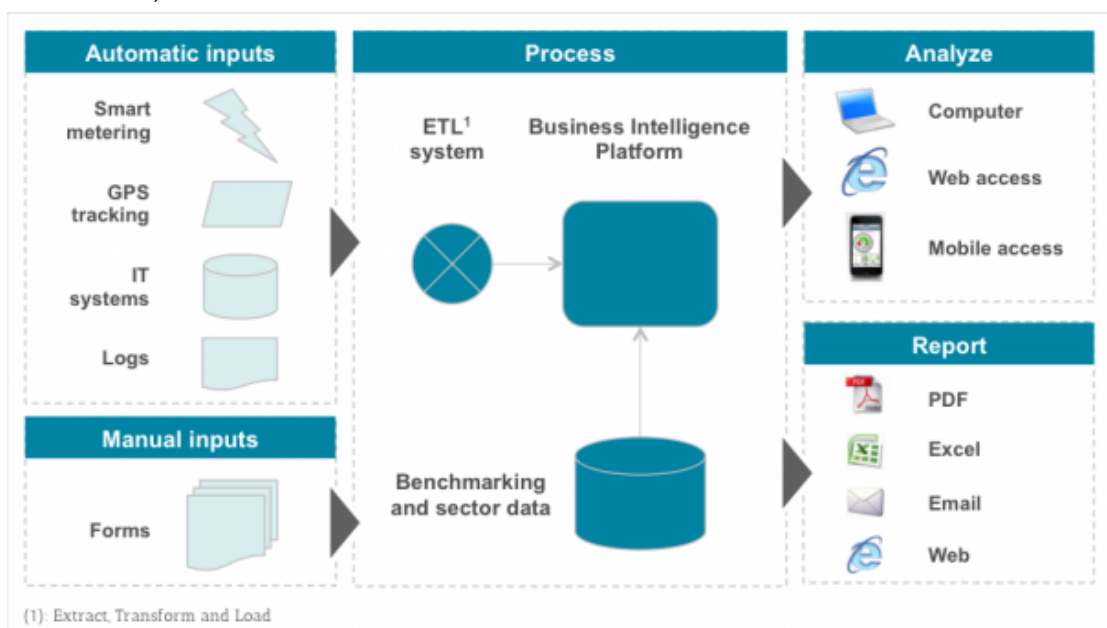


Exhibit 1 - Flowchart for Carbon Analytics, a real-time carbon footprint monitoring tool.

necessity. One of our clients asked us for help in selecting a carbon footprinting tool. In our opinion, the existing offer was either powerful but expensive or inexpensive but limited, so we proposed to create something in between. We were very happy with the final result, so we decided to make it into a commercial product. Here is what we learned in the process:

Be your first client

Most professional services companies have at some point developed internal tools to support their day-to-day activities, or have done so in response to the requirements of a particular assignment. Your product should not only be based on what you already do and know, but it should also be something you can use yourself. If it's not good enough for you, it will not be good enough for your clients. McKinsey Solutions, for instance, are both used by their consultants and offered to their clients as a stand-alone tool.

Integrate & Partner

In our case, Carbon Analytics bridged two areas we knew little about: smart

metering hardware and business intelligence software. These days, however, most likely somebody has already solved any given problem for you. On the software side, for instance, we opted to partner with CGI, which has a broad track record in software integration and business intelligence. Integrating & partnering with market experts not only saves you time and money, but also ensures that your solution keeps up with times.

Do not overlook design

Professional services companies are not used to investing much in design. After all, services are mostly sold based on knowhow and references, not user interfaces and looks. Products are different, as you need to woo your clients with the best possible customer experience. For Carbon Analytics, we hired a professional design firm to help us with all aspects of the product's look and feel (Exhibit 2 and 3), and we looked for differentiating ways to market it. Here is an example of a product presentation we did at Microsoft's Tech Days.

Keep your pricing simple

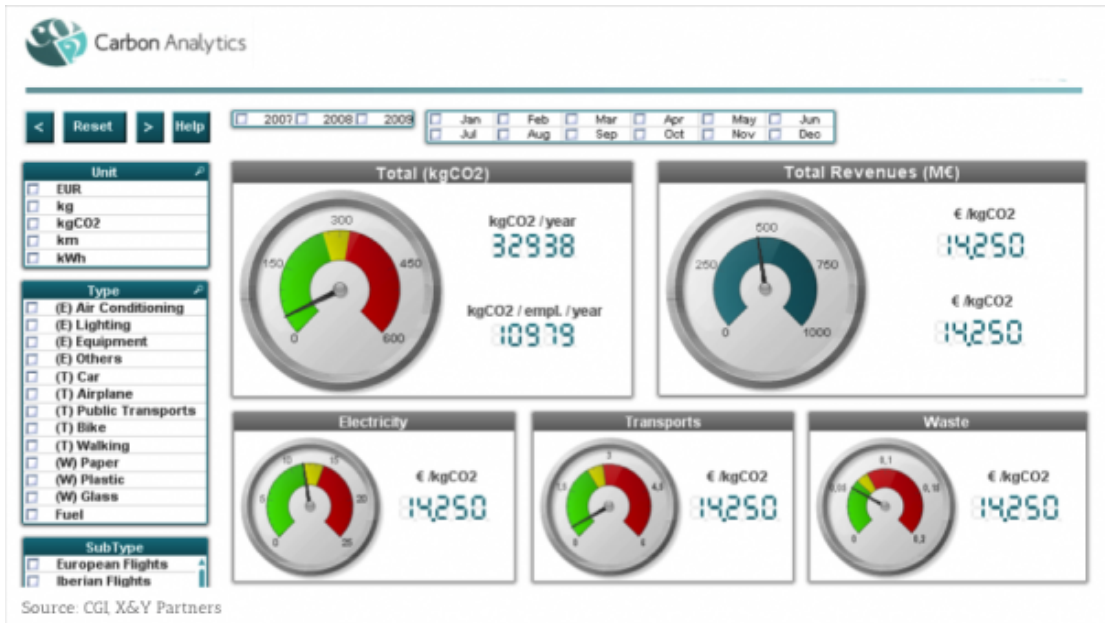


Exhibit 2 - Example of the Carbon Analytics interface.

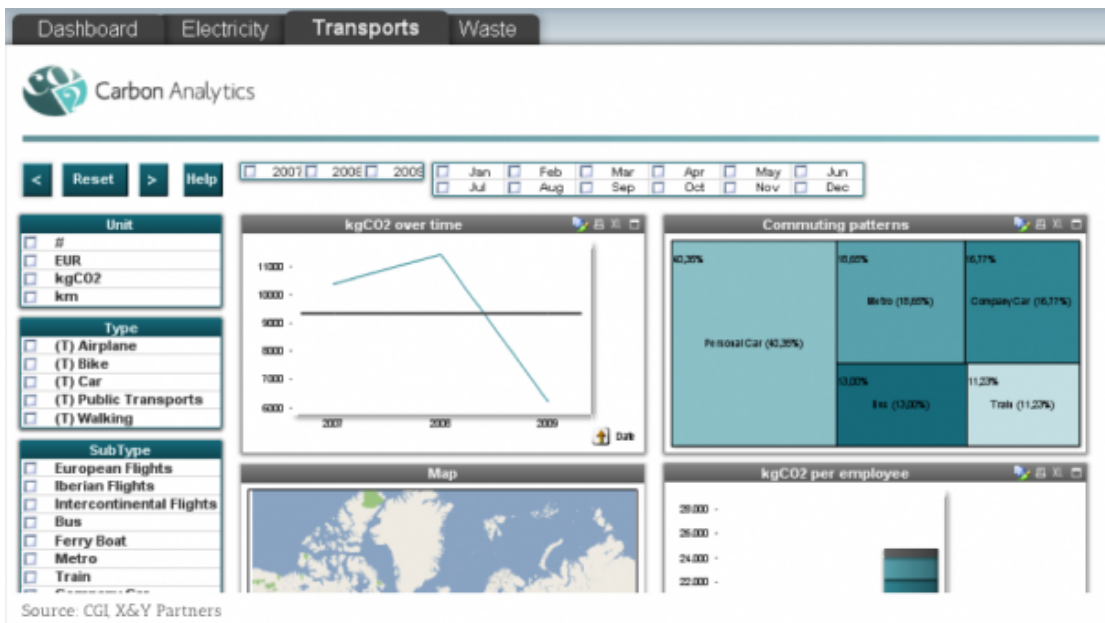


Exhibit 3 - Example of the Carbon Analytics interface.

Pricing services is usually very simple: you set an hourly rate and figure out how much time you need to complete a given assignment. Pricing a product is more complex, but it is important to keep it simple by, for instance,

identifying the single factor that most influences your product costs, and building your pricing structure around it. Carbon Analytics' cost, for instance, is particularly sensitive to the number of system interfaces (e.g. smart

meters, GPS devices, inputs and outputs to proprietary IT systems), so we built the pricing scheme around a

base configuration, plus an extra for each additional interface.

What do Boeing, Toyota and Resident Evil have in common?

The time it takes to develop and market a new product is as important as the product itself

These three companies share a common feature: they have created innovative strategies to reduce the time-to-market of their new products, surprising the competition and strengthening their market positioning.

In a recent assignment we worked with a large European construction company in the identification of new market opportunities outside of their core activity. This company is an expert in precast concrete technologies, and expects to leverage this expertise into new emerging areas. One of the most interesting options that came up was in the wind sector, where our client would be able to provide a differentiating product to a growing market segment: concrete wind towers for larger turbines (2,5MW+, placed at a height of 100+ meters), for which conventional steel

towers are no longer technically and economically feasible.

Developing an innovative product typically means building a solution from scratch: starting from the design development, prototyping and intellectual property, through defining prospective clients and up to the industrialization and commercialization. Quite a lengthy process, especially considering that several companies had already launched competing products. Thus, the key question to answer was: How can we shorten the time it will take to bring this technology to market?

The solution is not straightforward: time-to-market has to be short enough not to lose market opportunities, but long enough to minimize errors and rework, which lead to additional costs and the loss of market credibility.

We looked across different sectors to find examples of companies that had successfully shortened their product development cycles (Exhibit 1).

Company	Product	Time to Market	Improve work procedures	Form Partnerships
Boeing	Airplane Boeing 777	1.5 years less than the previous model developed by the company	<ul style="list-style-type: none"> Concurrent engineering – a work methodology where development tasks are integrated and run in parallel Intensive use of computer base programs – it was the first airplane to be fully designed by computer 	<ul style="list-style-type: none"> Eight airlines, potential clients, took part in the design stage of the Boeing 777, by attending to workshops and answering surveys
Toyota	Car models	18 months and the future goal is reduce to 12 months	<ul style="list-style-type: none"> Extensive use of computer-based digital design Improved methods for some of costliest and time-consuming elements of preparing a model for production 	
Ford	Hybrid system for light trucks and SUVs	Reduce the time to market for this type of product		<ul style="list-style-type: none"> With Toyota, both companies expect to introduce a cost effective product and lower time to market
CAPCOM	Video Games	Reduce by 1/3 the average time of 3-4 years	<ul style="list-style-type: none"> Redefine work procedures Unify 80% of development for all platforms 	<ul style="list-style-type: none"> Form alliances with software development companies in other countries to secure resources and expand sales
Sony	Smart Phones	Reduce by more than half time to market	<ul style="list-style-type: none"> Put tablets, mobile phones and computer business under the same R&D department 	

Source: X&Y Partners analysis

Exhibit 1 - Accelerate time-to-market for different business and companies.

One of the best examples of the importance of time-to-market is the Boeing 777, which took 6 years to develop, instead of the typical 8 to 10 years. This allowed Boeing to beat Airbus to the punch, launching one of the most successful airplanes in the history of commercial aviation. To make this possible Boeing used concurrent production, a methodology in which design, manufacturing and other functions are integrated and run in parallel. Boeing also created a working group with eight airlines to gather their contributions for the airplane design. This allowed them to weave customer needs directly into the final design. Today organizations like NASA regularly use this method to

decrease development times across a variety of projects.

Another way to reduce time-to-market is to joint-developed products. For instance, Ford and Toyota have partnered for the joint development of a hybrid-electric system for light trucks and SUVs, which will then be used by each manufacturer in their own models. Both companies feel that the risk that these models will later compete for the same market segments is offset by a shorter and less expensive product development cycle. Ford also has similar joint development agreements with General Motors and PSA-Peugeot-Citroën for other products.

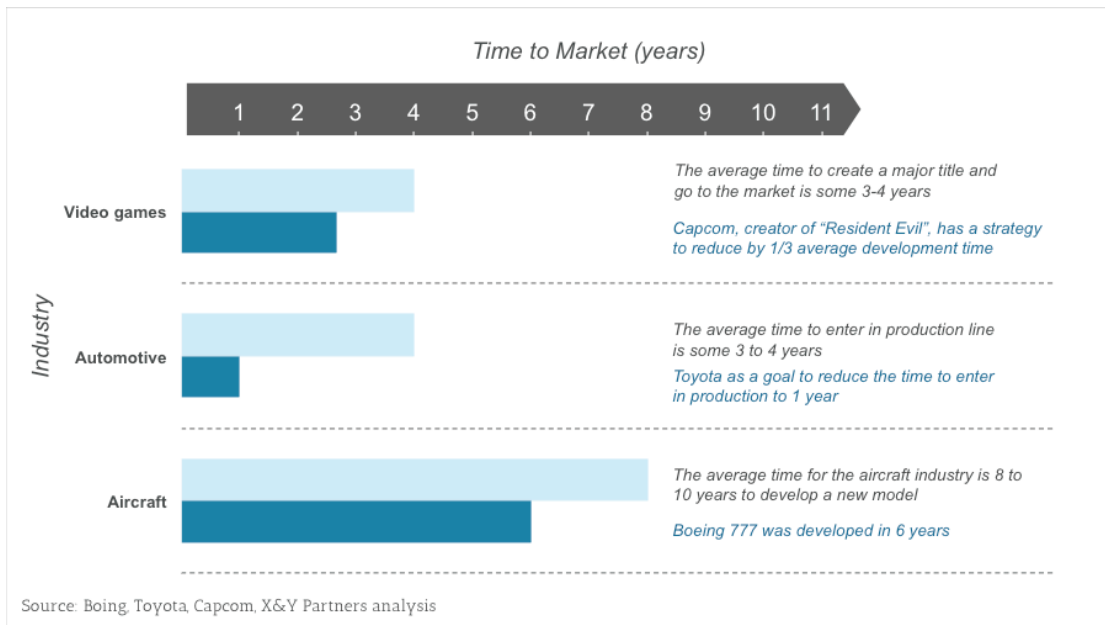


Exhibit 2 - Examples of products developed in a record time compared with average.

In a very different business line, CAPCOM, the Japanese game developer responsible for Resident Evil and other major titles, has a growth strategy for the next years that is based on accelerating the time-to-market of their products. The development of a major title, like Resident Evil, can require 3 to 4 years per platform. With the advent of mobile gaming platforms (e.g. iOS, Android, PSP) on top of an already fragmented traditional gaming market (e.g. PC, PS3, XBOX, Wii), CAPCOM feels that consolidation is in order, and thus has created a new framework where 80% of the development time is shared between all platforms. This optimization is expected to reduce costs and shorten the time-to-market

by more than 30%. They will also continue to form alliances with software development companies in other countries to secure resources and expand sales, something they have already done in the past with Resident Evil, and which proved to be very effective.

Can our client use any of these strategies to shorten the development of concrete wind towers? Yes, all of them:

Boeing’s concurrent production methodology can be used to parallel process many of the design, engineering, financial, legal and commercial tasks. This is particularly true given that developing a precast concrete wind tower is not that

different from developing a precast concrete bridge, so each business unit already knows what it needs to deliver to the other business units;

Joint product development might also be a very interesting option, particularly with a partner which already operates in the wind sector (e.g. a steel tower manufacturer or a turbine manufacturer);

CAPCOM's multi-platform development strategy can also help our client to overcome one of the biggest obstacles in wind tower design: developing products for multiple combinations of height and turbine model. A modular tower design can be used as a basis for all variations, with only a small amount of additional development required for each variation.

An old recipe for an emerging issue

Why it is important to give strategy a real life dimension, for instance, through the implementation of quick wins pilot projects

I really enjoy that moment, when you finish an assignment and you look back at your deliverable - that handful of slides that kept you up and running - and feel that everything you put in there makes perfect sense. It's like bringing order to chaos. Fighting entropy.

But, is that all? Is this handful of slides the final stage? The result of a work well done? We don't think so. To reach the final stage, you need to bring your slides to life, you need to make sure that all your ideas and conclusions are implemented (or at least implementable), even in challenging conditions (economic downturn, lack of liquidity, etc...). And one of the best ways to do so is by running a pilot: an old recipe for an emerging issue.

My first "management consulting" PowerPoint slide was miserable. I remember the look in my manager's face, torn between telling me the truth

and trying to avoid demotivation. It took me some time to get the grasp of it, but now I'm a total PowerPoint obsessive freak. The structure and flow needs to be perfectly Minto, the boxes need to be perfectly aligned, the colors have to match and have a reasoning behind, the storylines need to be crisp and clear.

I would say that almost every management consultant has been criticized, at least once, for being in the "paper business" i.e, for delivering reams of paper that end up at the bottom end of drawers and never see the sunlight again.

It is not always the consultant's fault though. A lot of stellar strategies don't ever get to be implemented because they are not convincingly sold to senior management or, as is often the case during economic downturns, because the investment and effort required to implement it are not readily available.

In our opinion, that handful of slides should thus just be the halfway-mark, a compass that guides the remaining steps of the project.

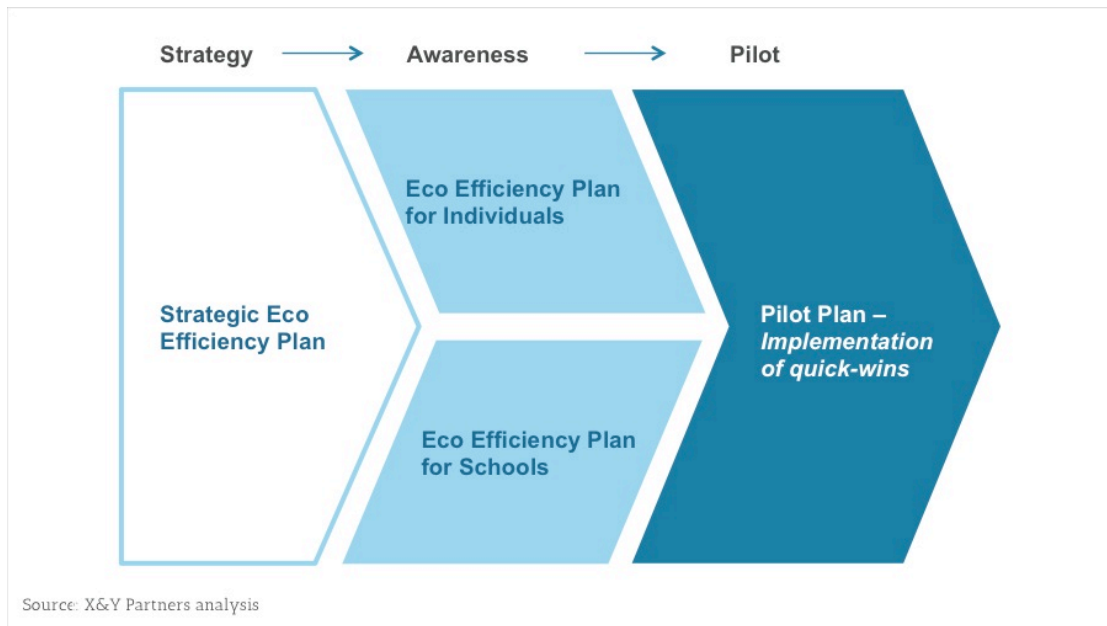


Exhibit 1 - Methodological approach for the Eco-Efficiency Strategy for Nisa.

We see every project as a three stage process: an initial phase, where you structure the approach and choose the best options (Strategy); a second phase where you discuss and build awareness around your plan (Awareness); and a third phase, where you must prove that it all makes sense (Pilot).

Our recent Eco-Efficiency Strategy for Nisa, is a great example of this approach (Exhibit 1).

Nisa is a Portuguese rural municipality in Alentejo (one of the poorest regions in Portugal) that despite the remarkable interest in energy efficiency, sustainability and low carbon economy, has a very tight

budget for these initiatives. For this project we created a long list of initiatives in the areas of energy, transports, waste, water, forest and biodiversity, and used a proprietary methodology to select a short list of approximately 50 initiatives, all financially viable on its own. The implementation of the full pack of initiatives represents, for the entire municipality, a decrease of 26% in the carbon emissions, an investment of 0,9 M€/year and a revenue of some 2,2 M€/year. If the available financing mechanisms (e.g. public funding, ESCO models, carbon credit generation) are leveraged, this investment may decrease down to some 0,32 M€/year.

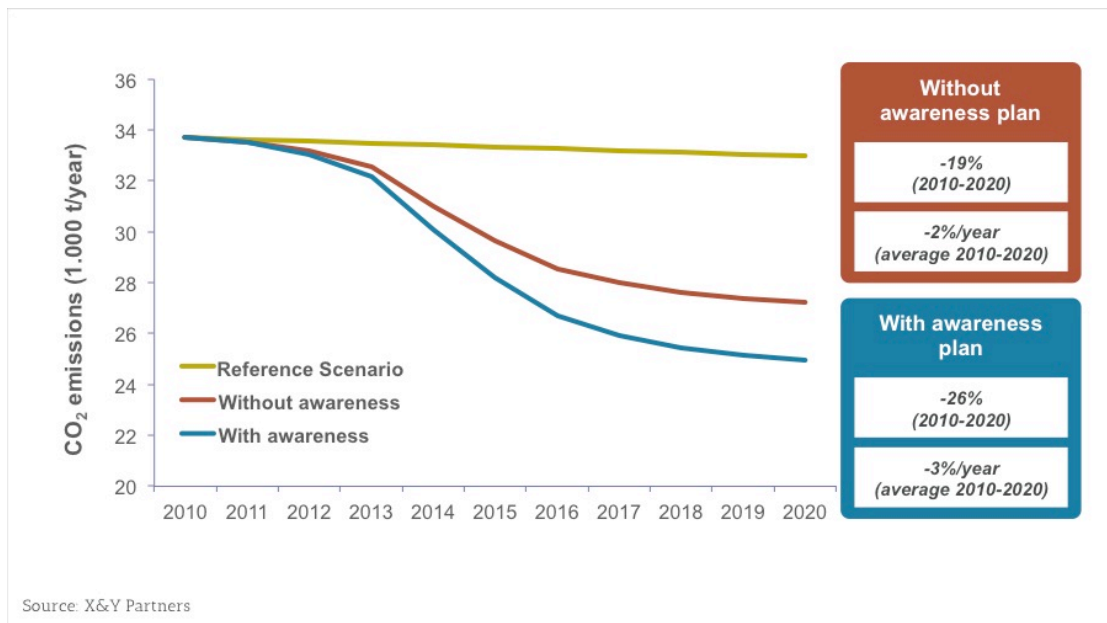


Exhibit 2 - Comparison among the different scenarios considered.

There's a catch however: numbers and charts will do very little to convince a Mayor or its citizens of the bona-fide nature of your plan; you will need actions for that. Thus, from the 50 initiatives, we selected 10 of the so-called quick wins: actions that could easily be implemented with a residual initial investment but with a significant impact (Exhibit 3). We also selected a Pilot Community, and concentrated all

our efforts there, to help build awareness and momentum.

In a couple of months, and with a small budget, we implemented these quick wins in the Pilot Community. Most of the results were very promising, and their expansion to the entire municipality is now being equated. However others had to be adapted to the reality that we found in the terrain (Exhibit 4).

Pilot Action		Recipients	Goal
P1	Incentives to recycling and composting	25 families	Reduce up to 30% the waste generated
P2	Economic Incentives Program	Companies	Support two applications
P3	Optimization of public areas lighting	Municipality	Reduce up to 10% the energy consumption
P4	Elaboration of best practices manuals	5 families; 2 companies; Municipality	Reduce 14 kgCO ₂ /person, the equivalent to 18 kWh of electric energy
P5	Creation of an Eco-Efficiency Support Cabinet	Overall population	Create and operationalize the support cabinet
P6	Creation and stimulation of a volunteers group	Overall population	Implement one project
P7	Optimization of the public transports system	Overall population	Create a car sharing platform
P8	Elaboration of a carbon credits program	Forest owners	Quantify the carbon credits potential
P9	Optimization of electric power factor	3 companies	Reduce up to 1,5% the reactive energy
P 10	Optimization of electricity and water contracts	Municipality	Reduce these costs up to 2,5%

Source: X&Y Partners

Exhibit 3 - Pilot Project main actions.

Pilot Action		Results
P1	Incentives to recycling and composting	An increase in the recycled residues was notorious for all the participants. However, the qualitative nature of the outputs received made it impossible to quantify
P2	Economic Incentives Program	The Economic Incentives Program, involving all the major stakeholders, was defined and approved by the municipality
P3	Optimization of public areas lighting	A 5% reduction in electricity consumption was obtained in the Pilot Community with the change in lighting schedules
P4	Elaboration of best practices manuals	Best practices manuals, created for individuals and companies, were widely distributed and are available in the Municipality web page
P5	Creation of an Eco-Efficiency Support Cabinet	The structure, personnel needs and competences of the Support Cabinet were defined as well as the main key success indicators for the success of this Cabinet
P6	Creation and stimulation of a volunteers group	A volunteers group was created (Eco Cucos) and their first initiative (an Eco Track) took place in the 22 nd of August 2011
P7	Optimization of the public transports system	The limited number of public transports led to a redesign of this initiative into a car sharing platform
P8	Elaboration of a carbon credits program	This initiative was redesigned to the creation of a Support Cabinet and support material to help forest owners take advantage of the Governmental and EU incentives for Forestry
P9	Optimization of electric power factor	The only company in the Pilot Community with capacity to implement this initiative had already implemented it
P 10	Optimization of electricity and water contracts	All the contracts were revised and savings of some 5% per year are expected in the electricity contracts

Source: X&Y Partners

Exhibit 4 - Pilot Project main results.

An example of the latter was initiative P7 (Optimization of the Public Transports System) that was redesigned to a car-sharing platform, given the residual number of public transports among the communities.

Another example was initiative P8 (Elaboration of a carbon credits program): during our initial conversations with the forest owner's community we realized that there was a striking lack of information regarding

support schemes for forestry. For instance, most of the owners couldn't understand the mechanisms that they had available to improve their lands or the steps needed to accomplish an application for grants. Implementing a carbon credits' program here seemed inappropriate, given the real nature of the problems that they were facing. Thus we redesigned this initiative into the creation of detailed flowcharts with all the steps necessary for the application to the most relevant financing mechanisms along with the creation of a Support Cabinet dedicated to this specific issue.

Sometimes the immediate implementation of the full strategy is not easy or even feasible. It is important then to be able to select the core of the project, the initiatives that can be readily implemented and gather critical mass. This will also give you a chance to improve on things that looked good on paper but don't really work out in reality.

The initial momentum is crucial, and if you can prove that your strategy makes sense and is "implementable", then it's much easier to gather buy-in for the rest of it.

X & Y: saving the environment & the economy

In these dire economic times, organizations across Europe are postponing environmental goals. They shouldn't: this is one of those areas where you can have the cake and eat it too.

March 2007 set the date for the “20-20-20” targets in the European Union: 20% less carbon emissions, 20% more renewable energy production and 20% more energy efficiency. Five years later and with only eight years left to reach 2020, a recent report states we will fall short of some of these objectives. Paradoxically, the economic downturn actually had a positive effect on some of these goals:

carbon emissions in 2010 have fallen 14%, due to the production slowdown. The reality is of course that going back to earlier production levels will likely lead to an increase in emissions and, because we have been refraining low carbon investments, this increase will be difficult to avoid.

In the midst of this grim scenario, something stands out: the Covenant of Mayors, a group of more than 4250 European municipalities voluntarily committing to surpassing EU's “20-20-20” targets”. In average, these municipalities committed to a 26% decrease in carbon emissions by 2020, 6% more than the EU goal (Exhibit 1).

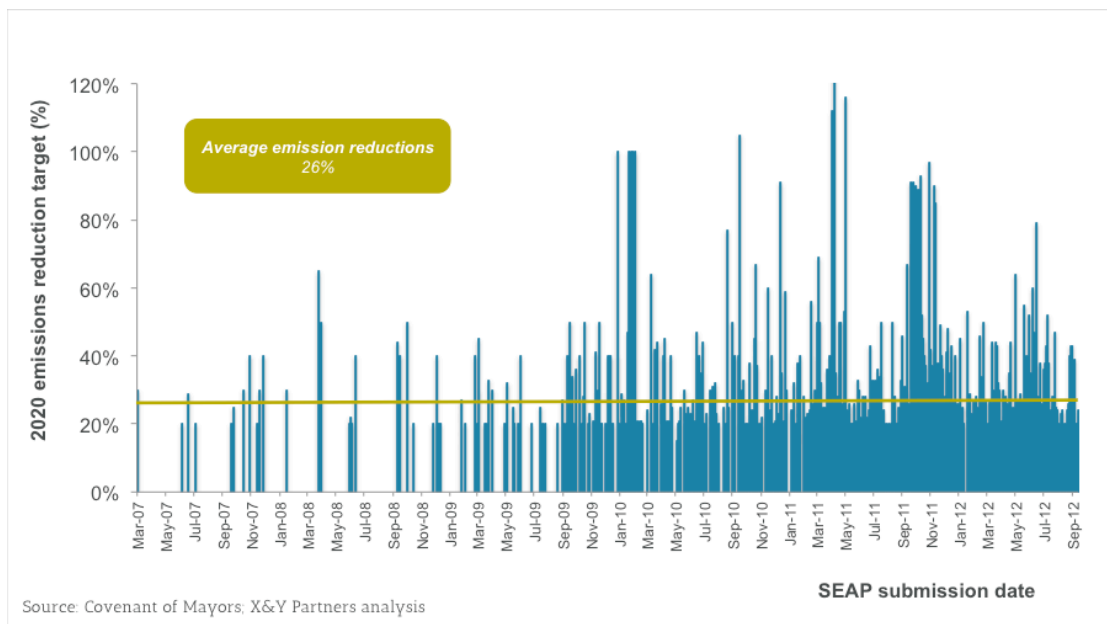


Exhibit 1 - Emission reduction targets for the Covenant of Mayors signatories.

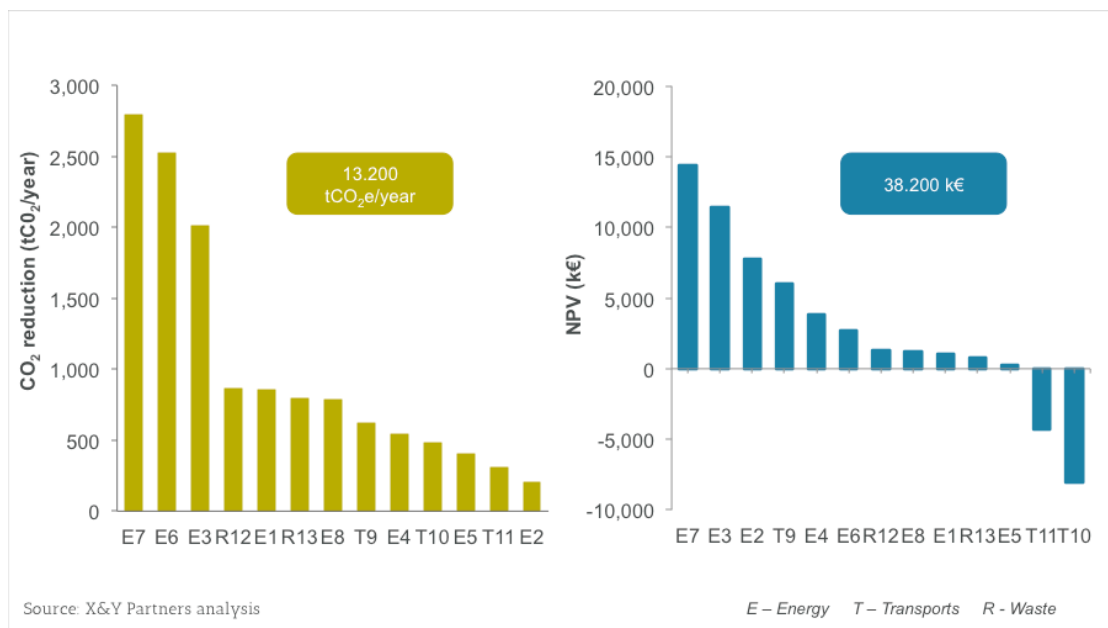


Exhibit 2 - CO₂e emission reductions and NPV for all the shortlisted measures.

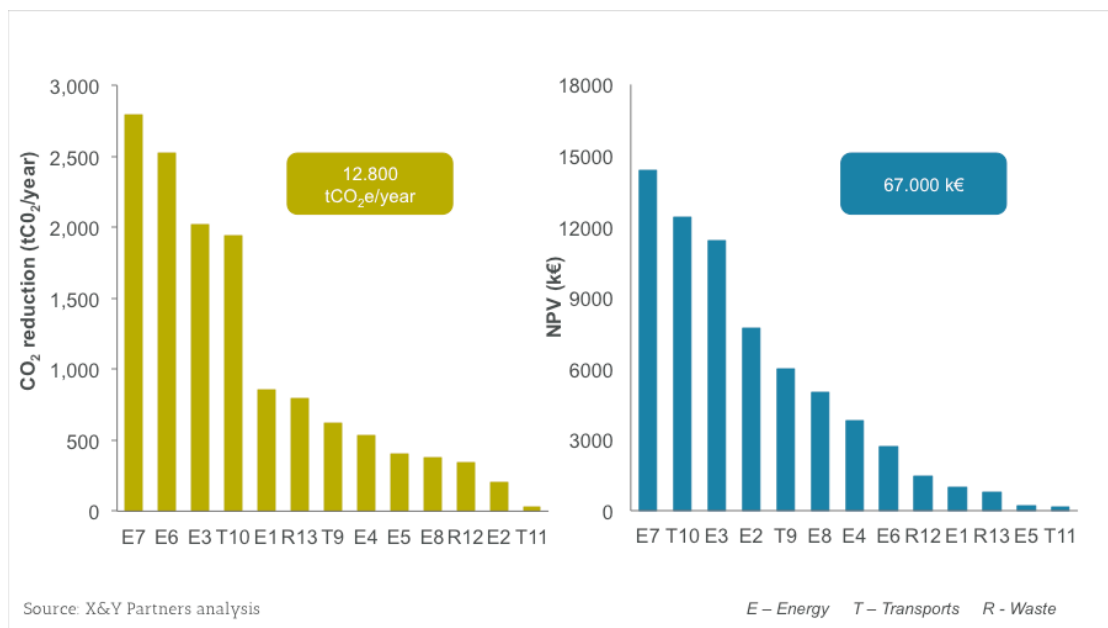
Can they do it? They can, but most of them probably will not.

Recently we were asked by Águeda, one of the Covenant of Mayors signatory municipalities, to help them draft their Sustainable Energy Action Plan (the document, called SEAP, is available here). Águeda is a small Portuguese municipality with limited access to funds but a sensible approach to the Covenant of Mayors: they want to reach or surpass the 20-20-20 targets exclusively through financially feasible actions (i.e. actions where the associated cost savings surpass the required initial investment).

Águeda's actions target three areas: Energy, Transports and Waste. Similar

actions are grouped into initiatives. The T10 initiative (Optimization of Road Infrastructures), for instance, includes the following actions (among others): creation of cycle paths and other infrastructures for bicycle use, creation of infrastructures for vehicles with alternative sources of power (electric cars, natural gas, etc.) and set up of a community transport network.

All of these actions are environmentally feasible i.e. all lead to actual carbon reductions (Exhibit 2). But not all are economically feasible. Initiative T10, for instance, included the creation of a network of gas-powered mini-buses that, in the case of Águeda, lacked scale to be financially viable.



Source: X&Y Partners analysis

E - Energy T - Transports R - Waste

Exhibit 4 - CO₂e emission reductions and NPV for all the “financially viable only” measures.

Taking out all financially unviable actions vastly improves the plan’s financial attractiveness, with a limited impact on carbon reductions (Exhibit 3). And even with limited investment capacity, financially viable actions can be funded through several mechanisms, such as performance contracts.

With this plan, Águeda committed to a reduction in carbon emissions of 33% by 2020, which is higher than the target established by 88% of all Covenant of Mayors signatories.

Águeda is surely not an isolated case. Other municipalities hold the potential not only to surpass EU’s 20-20-20 targets, but also to do it with significant economic benefits. But will they do it?

If you look at the 10 last approved SEAP reports, none of them includes a financial feasibility analysis, and three of them don’t even quantify the investment required to implement the recommended actions. This apparent decoupling between environmental and financial analysis will likely stall or slow down the SEAP implementation. In fact, so far none of the signatories has presented an implementation report.

This is not an insurmountable issue. In fact, the Covenant of Mayors has already accomplished something far more difficult, which was to put 4250 municipalities understanding and quantifying the somewhat opaque notion of carbon emissions. Extending the SEAP requirements to include

financial analysis seems easy by comparison, since this is a competence that all municipalities already possess.

This is of course something that makes sense for any plan to reduce carbon emissions or increase energy

efficiency, both for public and private organizations.

Ultimately, environmental efficiency and economical efficiency boil down to the same thing: producing more with less.

Innovation in the cycling industry goes well beyond the bikes

How the cycling industry is shaping up for growth by addressing the demand for active lifestyles better than any other sport

There are not a lot of sports where you can buy a product that is better than what the pros use. Amazing as that is, the cycling industry's biggest revolution is not based on exotic materials and high-tech designs, but rather on a smart marketing move: by placing the bicycle in the center of an open-to-all, inclusive experience, the cycling industry is addressing the generalized trend for active lifestyles better than any other sport.

A few decades ago, being active was not particularly challenging, as most professions were physically more strenuous, and amenities were generally less available. Economical and social development has made us more sedentary but also more

attentive to our health and wellbeing, spurring a slow but generally steady demand for "active leisure" (Exhibit 1).

Most sports are not particularly well positioned to address this trend. Gyms require you to drive through traffic to spend one hour in a dark and overcrowded room. Group sports, such as football and soccer, force you to synchronize your schedule with that of your teammates. Sports such as swimming or tennis need special infrastructures. Running does not require a lot of gear, but can be physically demanding for many.

Less than 20 years ago, cycling was also not well positioned to capture this trend. Bicycles were either seen as a thing of the past, used before the car became commonplace, or something reserved for lycra-wearing, pain-seeking eccentrics. That's not the case anymore, and major bike brands have a lot to do with that.

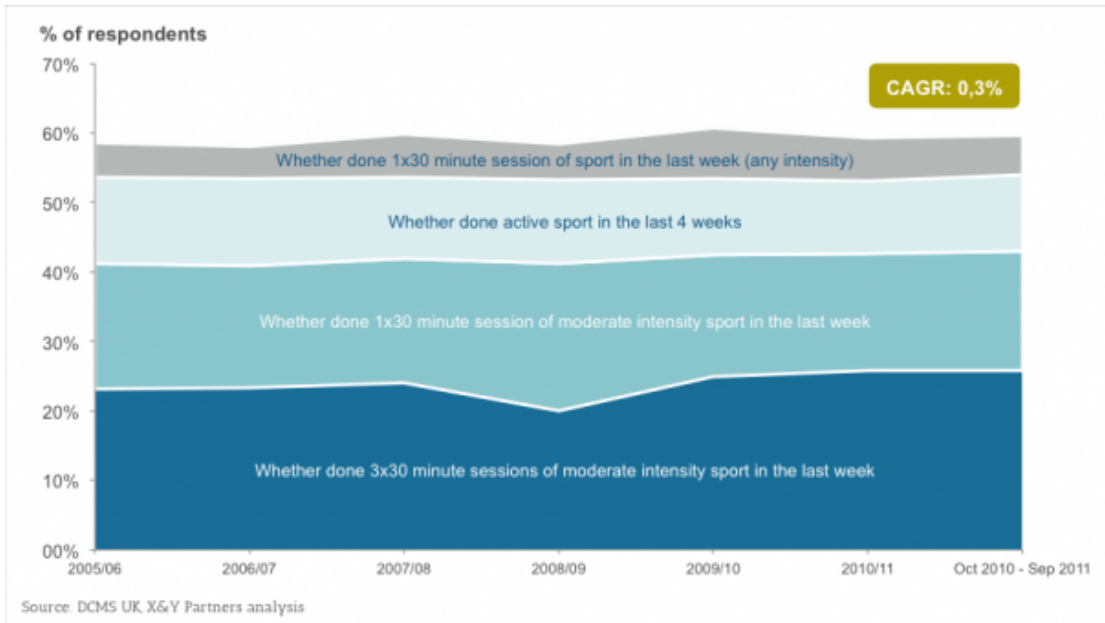


Exhibit 1 - Results of the UK Taking Part survey (2005-2011).

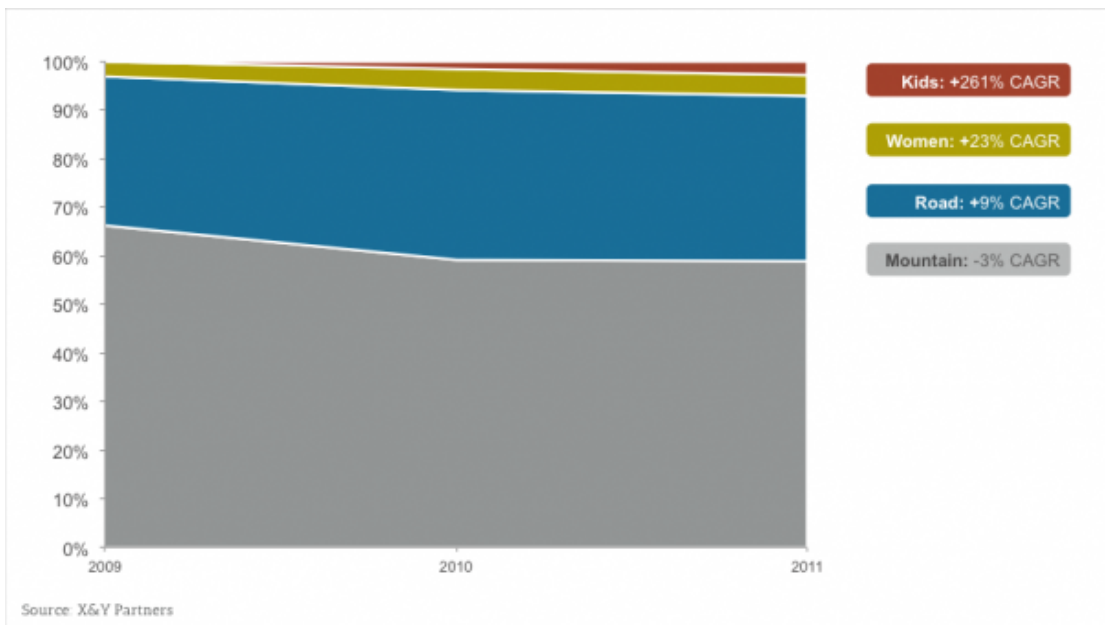


Exhibit 2 - Sales evolution for major bicycle segments at an illustrative Specialized retailer.

Take Specialized for instance, one of our clients. Specialized was created in California in 1974, and is now one of the world’s largest bicycle brands. The company’s current product range includes everything you’ll need to

make use of your bike, from accessories (clothing, glasses, helmet, tools) to services (holidays, bike fitting, nutritional products, training plans). The product range has also been expanded to cater for more users, with

targeted products for women and children, which are a growing part of

and has created a separate brand – Globe Bikes – for its urban range.

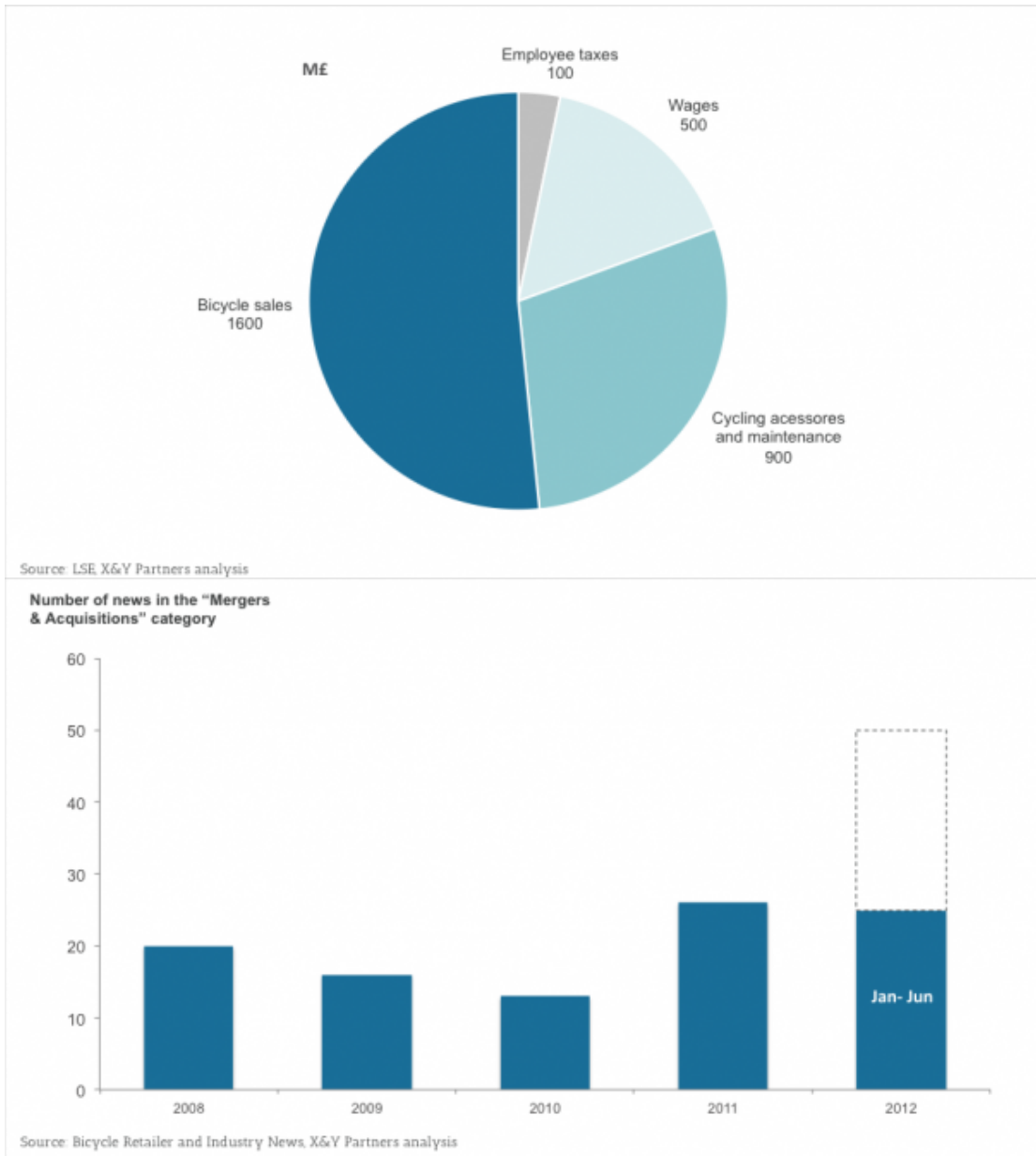


Exhibit 4 - Number of news related to mergers & acquisitions in the cycling industry.

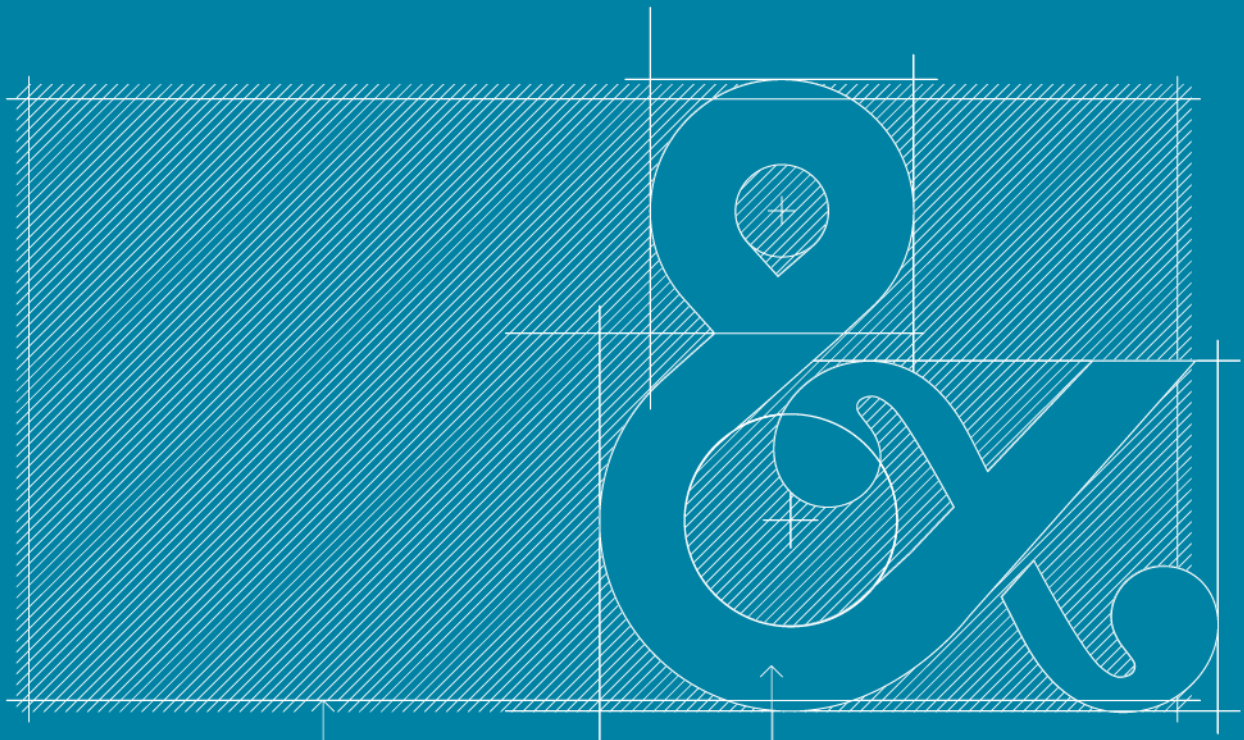
the company’s revenues (Exhibit 2). The company has however taken special care not to shy users away by overshooting the open-to-all experience into a bike-centric lifestyle,

The impact of the cycling industry’s market shift goes well beyond the bicycle manufacturers. A report from the London School of Economics suggests that the cycling industry generates close to 3.000M£/year for

the UK economy (Exhibit 3), with additional savings coming from reduced absenteeism, traffic congestion and pollution levels.

These numbers are expected to grow, as more and more people take cycling as a sport and a transportation option, and new developments such as electric bikes become more accessible.

Cycling is, of course, subject to a multitude of cyclic factors, such as fashion, weather or consumer purchasing confidence. However, the underlying trends described here – increasing demand for active leisure and a return of the utilitarian bicycle – seem to be here to stay. And there is certainly an increasing M&A buzz in the cycling industry, so investors also seem convinced there is potential for growth (Exhibit 4).



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