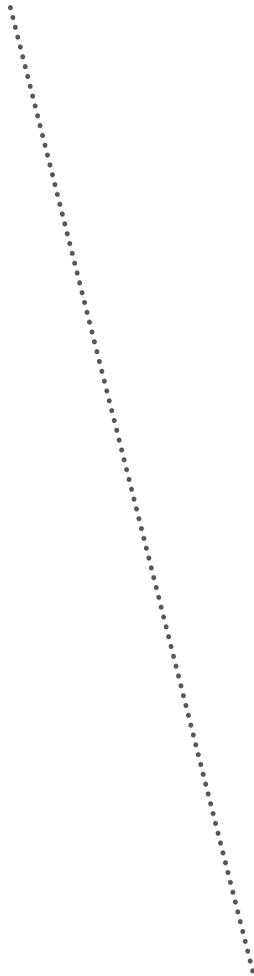
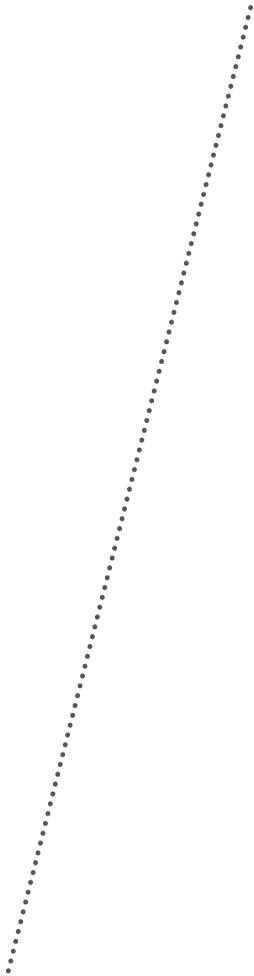


ENOVOS
TRENDWATCH

SMART HOME
SMART LIVING
2030



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**ETIENNE SCHNEIDER**

DEPUTY PRIME MINISTER
MINISTER FOR THE ECONOMY
LUXEMBOURG

INTRODUCTION

The next stage for the ENOVOS **TRENDWATCH** begins this year. No longer do we focus exclusively on 2020; now we include the following decade and expand our horizons to 2030.

An additional step like this is essential. It's our duty to address the long-term challenges of energy supply to our businesses and to the people living and residing in Luxembourg and the greater area and this makes it necessary to do so today.

Even Europe is dedicating itself to the 2030 outlook. Newly established targets are designed to steer the course for the entire energy sector, which is currently undergoing a transition of unprecedentedly large proportion. The task is to find the right balance between secure supply, economic viability and sustainability. It's also extremely important to learn from our experience of the last several years since the climate and energy package was established in 2007 with a time-line until 2020.

Europe has made good strides in its efforts to open electricity and gas markets, but this still isn't finished. Great progress has also been achieved in the area of renewable energies, though the individual Member States are using different approaches and progressing at different speeds. New approaches to the European measures to improve energy efficiency have well and truly strengthened the demand side toward the supply side. The emission of climate-altering gases was reduced, though some instruments haven't had the hoped-for success.

The task now is to set targets for 2030 and send the right signals to the markets. Luxembourg has defined its stance and its requirements for the climate and energy package:

- We advocate for stronger Europeanisation of energy and climate policy;
- We strive for common, active European approaches and we are opposed to divergent national policies;
- We campaign for cost-efficient and market-compliant solutions which convince people and companies over the long term to pursue the goals of changing our energy supply;
- We call for ambitious and binding 2030 targets for all of Europe of 40% less climate-altering emissions, at least a 30% share of renewable energies and a general 30% greater energy efficiency.

The course for 2030 has already been set. This should trigger a wide-ranging discussion. It's imperative for both civil society and industry to tackle this topic in-depth. We need a societal consensus to accomplish the profound and necessary changes to our energy system.

The ENOVOS **TRENDWATCH** 2030 aims to address the future issues related to energy and climate policy and to thereby present them to a broad and interested audience. I congratulate Enovos for taking this path and encourage everyone involved to keep at it. This is a substantial contribution to setting the course for long-term European and national energy and climate policy.



Etienne Schneider

FOREWORD



JEAN LUCIUS
CEO ENOVOS LUXEMBOURG S.A.
LUXEMBOURG

Dear readers,

You're now holding in your hands the second issue of our trend study ENOVOS **TRENDWATCH** 2030. This time Enovos switches its focus to the topics of smart homes & smart living, the challenges and issues of housing, living and building in the "smart" world of tomorrow. Our survey on this topic included more than just experts in Luxembourg, Germany, France and Belgium; we also talked to the populace in each country.

We've added another new feature to show us whether our energy transition is on track: the ENOVOS **READINESS INDEX**. It measures the progress made toward energy transition from the perspective of the citizens and experts. For one, this helps us make an international comparison of the restructuring of the energy supply systems. For another, it displays the varying significance of the influential factors which either drive the energy transition forward in each country or hinder it, not just at present but until 2020. You'll also find answers here to the question of whether one or more of these countries is taking a pioneering role in the energy transition or not.

The project of the century, energy transition, is taking place at the local level today and in the future right in your homes, as readers of this trend study. Together with your local experts, you decide how fast the energy transition will take place in your own four walls, and what it will look like. Enovos is aware of this and has again approached the renowned

opinion research institutes TNS Ilres and TNS Business Intelligence for the 2014 issue of the trend study ENOVOS **TRENDWATCH** about conducting a highly professional, transnational analysis that will preserve our demands for neutrality. Thanks to your participation as citizens and as experts, we now have the results of that study.

In line with our motto "Energy for today. Caring for tomorrow.", Enovos would like to contribute to this topic with this publication. The trend study ENOVOS **TRENDWATCH** "SMART HOME - SMART LIVING 2030" is targeted to all interested users, operators, specialists and decision makers who find the topic of energy and the changes in the energy landscape exciting and who would like to take a proactive role in shaping the way our lives and homes will look in the future. The study is also targeted to all interested parties in industry, education and politics. We hope that these three elements, the "ENOVOS **READINESS INDEX**", "Smart Home" and "Smart Living", will prove to be mainstays for local development.

It was important to Enovos, in a Europe without borders, to not only survey professionals in the greater area but to also give citizens in Luxembourg, Germany, France and Belgium their say.

It's becoming more and more important in Luxembourg and the greater area to deal proactively with the issue of shaping our fu-

ture. This is how to create liveable visions for the future for everyone, where technological possibilities are captured in political concepts and then adequately reflected in societal discussions so that the challenges of our time can be addressed.

Given that the study is meant to provide impetus to the interplay between these three topics, it's important to state that we are intentionally not only capturing the perspective of the energy suppliers. We're convinced that it takes an holistic approach to do justice to a topic this complex.

That's why, thanks to this trend study, visions of the future have their place at Enovos, where we present issues related to our lives in five, ten or 20 years and where we give room to trends which will influence the daily lives of private individuals, business and the society as a whole.

Given that Enovos would like to accompany this process in the future, we hope to repeat the ENOVOS **FUTURE SUMMIT** on interesting topics about the future every two years to create a platform where the country and the greater area can be inspired by interesting discussion.

On that note, I wish you some exciting reading.

A handwritten signature in black ink, consisting of a stylized, elongated shape with a vertical line intersecting it, and a horizontal line extending to the right.

Jean Lucius



DR. SABINE GRAUMANN

SENIOR DIRECTOR
TNS BUSINESS INTELLIGENCE,
MUNICH,
GERMANY

MANAGEMENT SUMMARY

An international comparison of the energy transition and smart home

Rising energy prices, climate change and the increasing shortage of fossil fuels make it indispensable that each business centre have an intelligent energy supply system.

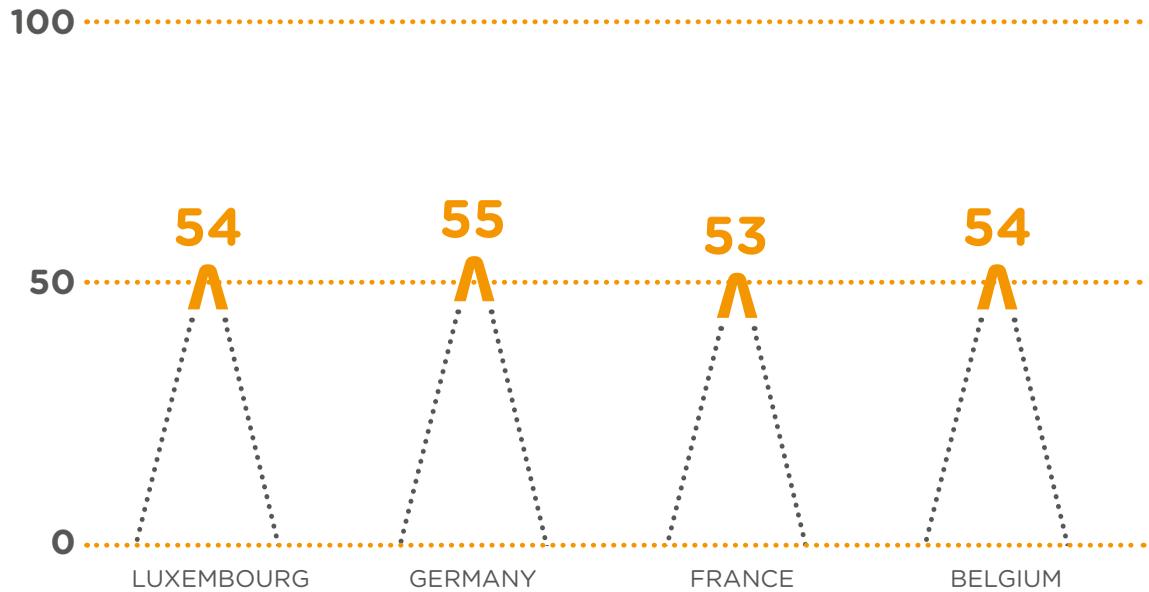
In preparing the second ENOVOS **TRENDWATCH** in June and July 2014, we surveyed 1,000 citizens each in Luxembourg, Germany, France and Belgium and a total of 531 experts. We wanted to determine how much progress each country has made in restructuring its energy supply systems and what factors are accelerating or hindering the energy transition in these countries. We have worked out the critical factors of success which energy policy in each country should focus on when developing its energy roadmap over the next several years. In particular, we take an in-depth look at the challenges and perspectives of the smart home market as a special growth driver. The survey respondents assess the future of building and housing and the new technological possibilities for rational energy usage.

TNS Ilres and TNS Business Intelligence designed and conducted this international study together at the request of Enovos. But first, a team of international experts shared their comments on the particularities of smart living in each country.

1. ARE WE ON TRACK FOR THE ENERGY TRANSITION?

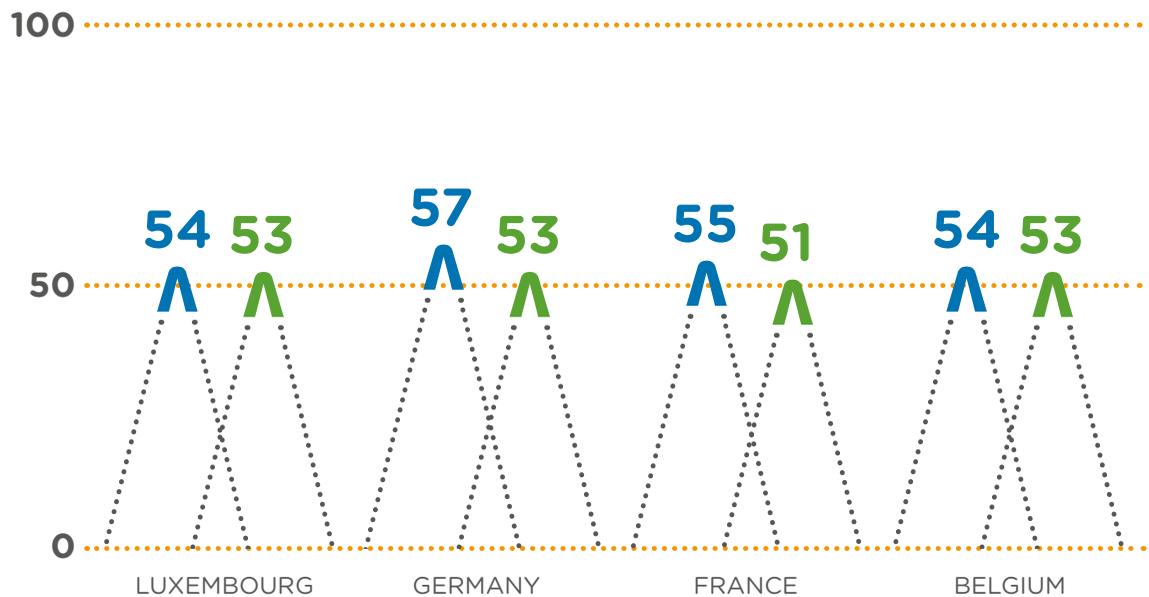
The ENOVOS **READINESS INDEX** answers this question. The assessments made by the survey respondents with respect to the necessity of energy transition, their satisfaction with the measures taken to date, and their expectations for the coming years are aggregated into one number. The ENOVOS **READINESS INDEX**

THE ENOVOS READINESS INDEX 2014



THE ENOVOS READINESS INDEX 2014 IN DETAIL

THE EXPERTS RATED THIS HIGHER THAN THE CITIZENS DID IN ALL COUNTRIES.



■ Experts
 ■ Populace

ranges on a scale of one to a maximum of one hundred points, which would be the best rating (and only achievable in theory).

Standstill at the half-way point. No country is blazing a trail.

Germany was rated 55 out of 100 possible points, putting it first among the four countries studied. At the same time, this means that Germany's performance on its path to a new energy supply system is only half as good as it could be from the perspective of its citizens and experts. Luxembourg and Belgium follow close behind with 54 points each and France with 53 points.

In each of the countries, the experts view the progress toward energy transition already made in a better light than its citizens. The experts gave Germany 57 points on the index. German citizens were more reserved, granting 53 index points. France received 55 index points from the experts and 51 points from its citizens. In both Luxembourg and Belgium, the experts granted 54 points and the citizens gave their countries 53 points.

CONCLUSION: Each of the four countries managed to reach the break even point, but with an enormous gap to the best possible rating. All four countries are rated about the same, with only marginal differences among them. In the view of the survey respondents, none of the countries is blazing trails or taking a pioneering role in the restructuring of its energy supply.

2. WHAT IS THE ATTITUDE TOWARD THE ENERGY TRANSITION?

The energy transition is necessary. Most citizens and experts are dissatisfied with the progress made in this respect. The energy transition will not be complete in 2030.

Respondents are in agreement that the energy transition is necessary. This affirmation was greatest in Luxembourg. In the Grand Duchy, 90% of experts and 79% of citizens feel that restructuring the energy supply system is "mandatory" or "necessary". About three quarters of the Belgian (76%), German (75%) and French (73%) experts and 74% of Germans, 65% of Belgians and 63% of the French view the energy transition as "mandatory" or as "necessary".

On average, 45% of citizens and 43% of experts in each country consider the energy transition measures taken to date to be insufficient ("more bad than good" or "bad"). A good 36% of all respondents ranged in their ratings on average between "more good than bad" and "more bad than good".

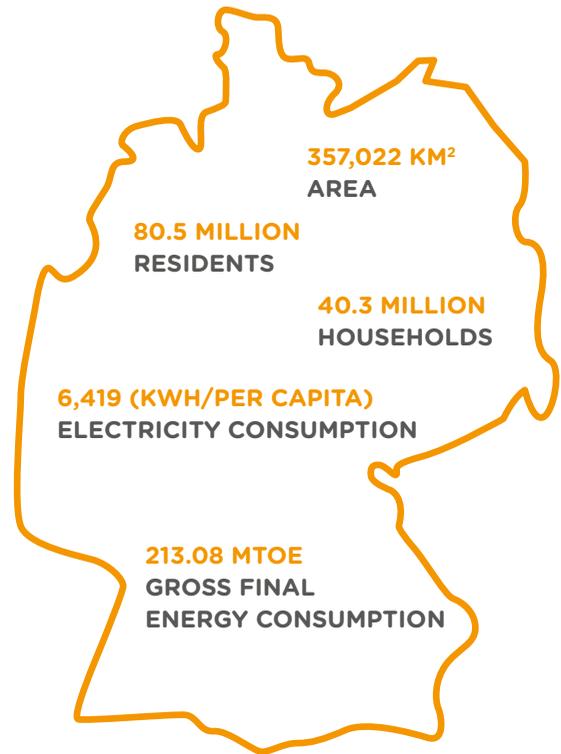
On average, 47% of German and French, 45% of Luxembourg and 41% of Belgian citizens rated this "more bad than good" or "bad".

Of the experts, 54% in Luxembourg, 44% in both France and Belgium and 33% in Germany agreed with them. The Luxembourg citizens (39%) and the Belgian experts (36%) demonstrated the greatest optimism with their ratings of "more good than bad". These were opposed by the pessimistic "more bad than good" ratings of the Luxembourg experts (42%), the French citizens (38%), and the Belgian (34%) and German experts (25%).

GERMANY

55

of 100 possible points in the
ENOVOS READINESS INDEX
 Top ranking in the four-country
 comparison



75%

of German experts consider the
 energy transition necessary.

74%

of German citizens agree
 that the energy transition is necessary.

33%

of German experts are dissatisfied
 with the energy transition progress made.

47%

of German citizens give
 poor marks for the energy transition
 measures taken so far.

42%

of German experts are not
 sure whether the restructuring of the
 energy system will be complete by 2030.

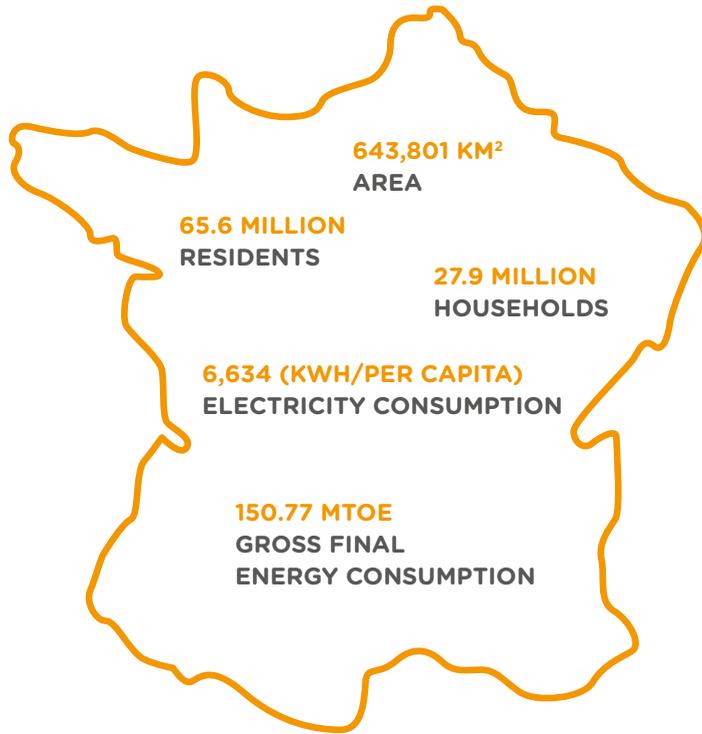
44%

of German citizens do not believe
 that the energy supply will mainly come
 from alternative energy sources by 2030.

FRANCE

53

of 100 possible points in the **ENOVOS READINESS INDEX**
Bottom ranking in the four-country comparison



73%

of French experts consider the energy transition necessary.

63%

of French citizens agree that the energy transition is necessary.

45%

of French experts are dissatisfied with the energy transition progress made.

47%

of French citizens give poor marks for the energy transition measures taken so far.

40%

of French experts are not sure whether the restructuring of the energy system will be complete by 2030.

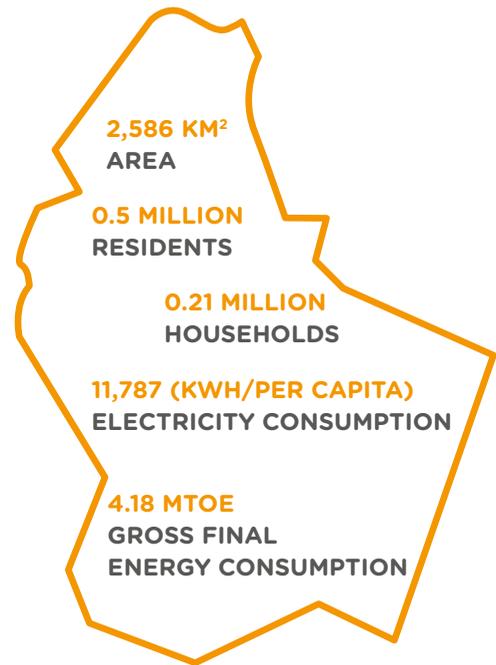
41%

of French citizens do not believe that the energy supply will mainly come from alternative energy sources by 2030.

LUXEMBOURG

54

of 100 possible points in the **ENOVOS READINESS INDEX**
 Rank 2 shared with Belgium in the four-country comparison



90%

of Luxembourg experts consider the energy transition necessary.

79%

of Luxembourg citizens agree that the energy transition is necessary.

54%

of Luxembourg experts are dissatisfied with the energy transition progress made.

45%

of Luxembourg citizens give poor marks for the energy transition measures taken so far.

51%

of Luxembourg experts are not sure whether the restructuring of the energy system will be complete by 2030.

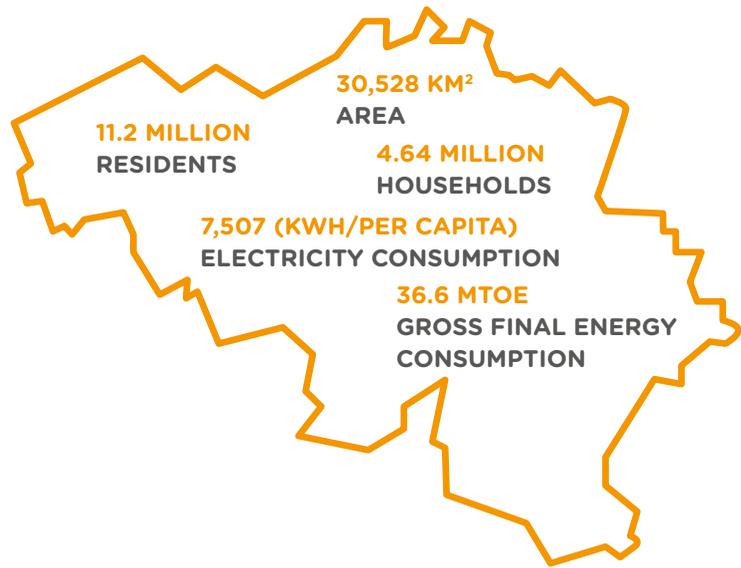
49%

of Luxembourg citizens do not believe that the energy supply will mainly come from alternative energy sources by 2030.

BELGIUM

54

of 100 possible points in the **ENOVOS READINESS INDEX**
 Rank 2 shared with Luxembourg in the four-country comparison



76%

of Belgian experts consider the energy transition necessary.

65%

of Belgian citizens agree that the energy transition is necessary.

44%

of Belgian experts are dissatisfied with the energy transition progress made.

41%

of Belgian citizens give poor marks for the energy transition measures taken so far.

37%

of Belgian experts are not sure whether the restructuring of the energy system will be complete by 2030.

34%

of Belgian citizens do not believe that the energy supply will mainly come from alternative energy sources by 2030.

Most of the experts in all four countries agreed that the energy transition in their countries would not be completed by 2030. In Luxembourg, 51% of the experts are not sure (“less certain” or “uncertain”) whether the energy supply will mainly consist of alternative energies by 2030. This uncertainty is shared by 42% of the German, 40% of the French and 37% of the Belgian experts. Among the citizens, 49% in Luxembourg, 44% in Germany, 41% in France but only 34% in Belgium are also uncertain.

In contrast, 37% of the German and Belgian, 24% of the French but only 20% of the Luxembourg experts are sure (“quite certain” or “certain”) that the energy restructuring will be done by 2030. This opinion is shared by one fifth of the Luxembourg and French citizens, by 25% of the Belgians and by 22% of the German citizens.

CONCLUSION: Experts and citizens are convinced of the necessity of the energy transition. So far, no one is satisfied with the progress made. Many survey respondents rated the implementation somewhere between positive and negative. Experts and citizens are not convinced that the transition will be complete by 2030. Energy transition is in a state of flux. There is a lot of room for improvement.

3. ARE THE TARGETS SET BY THE EU TRULY REALISTIC?

Targets set for greenhouse gas emissions for Germany and Luxembourg are unachievable. Energy efficiency goals: Cautious optimism in Luxembourg. Implementation of renewable energies: Germany is optimistic.

The EU Commission aims to reduce greenhouse gas emissions by 20% between 2005 and 2020. Belgium has already surpassed its goals. France has attained 96% of its goals.

However, Germany and Luxembourg have only made progress of 39%. The target of the EU Commission in the area of greenhouse gas emissions is deemed by 62% of Luxembourg, 61% of French and 57% of German experts to be unrealistic. Remarkably, only 35% of Belgian experts feel it is possible to reach the target, while 36% find it impossible. This might be due to the lack of public communication.

Renewable energies should account for 11% to 23% of the gross final consumption of energy by 2020. The Germans have already achieved 69% of this target, ahead of France at 58%, Belgium at 52% and Luxembourg at 28%. In this respect, 59% of German, 36% of French, 39% of Belgian but only 15% of the Luxembourg experts believe that their own country will completely fulfil the EU target for 2020.

Between 2006 and 2020, energy consumption should be reduced by 20% through saving and effectuation measures. So far, Luxembourg has achieved 46%, Germany 33%, France 31% and Belgium 26% of this target. As to this target, 51% of experts in Luxembourg, 47% in Germany, 45% in France and 33% in Belgium feel it will not be fully achieved by 2020.

CONCLUSION: From the perspective of the surveyed experts and citizens, the EU Commission's targets are too ambitious. They should be reviewed on a regular basis and adjusted to fit the actual progress. We need successes which citizens and experts will perceive and accept as such.

4. WHAT'S HINDERING THE ENERGY TRANSITION?

There are numerous barriers in the way of a rapid energy transition. Experts and citizens have given their opinion about 18 influential factors from the action areas of “energy policy”, “prices”, “infrastructure” and the “application and use of new energy forms”. With their assistance, we identified each factor which has a strong or weak influence on the success of the energy transition in each country. This ranking might be helpful for taking the right decisions for managing the energy transition with respect to specific conditions in each country. We summarise the results into an energy roadmap for ease of understanding.

“Energy policy”:

Mainly strong significance - great dissatisfaction - improvement only tentative.

From the perspective of all the surveyed citizens and the experts in Luxembourg and France, energy policy played a strong role in the implementation of the energy transition in 2014 in all countries. The citizens in Germany, France and Belgium rate the actions taken so far in 2014 to be “more bad than good”. Only the citizens in Luxembourg felt the progress of energy policy to be better, with a rating of “more good than bad”. French experts anticipate that the quality with which political measures are implemented in this area will improve to “more good than bad” by 2020.

Political opinion, as we can see in “withdrawal from nuclear energy”, is spread very wide. In France, the “withdrawal from nuclear energy” maintains its primary significance for the future for experts and citizens. They rate it “more bad than good” for both periods of time. In Germany, citizens and experts also consider the “withdrawal from nuclear energy” in 2020 to be of primary significance, rating it “more good than bad”, although German experts found it to be relatively insignificant in 2014. In Belgium, the

“withdrawal from nuclear energy” is and remains of secondary importance for both periods of time. Belgian citizens expect progress to shift from “more bad than good” to “more good than bad” by 2020. In Luxembourg expectations show that the “withdrawal from nuclear energy” does not play a major role. Given that there is no nuclear energy available, it is also rated as “more good than bad”.

CONCLUSION: The mainly critical rating of energy policy might be interpreted as an appeal to the governments to act more than they have so far. This doesn't necessarily mean more state regulation. Rather, it could mean designing a more flexible subsidisation system, correcting the communication deficit, institutionalising direct dialogue formats and providing more information and clarification to consumers about subsidies and the necessity of the measures.

“Prices and Costs”:

Unstable energy prices and production costs for alternative energies are critical barriers - mostly strong dissatisfaction with current and future prices.

The citizens and experts in all countries mostly agree that the price stability for energy and electricity prices and the production costs of alternative energies are critical factors of success. This was initially not the case for the experts in Luxembourg, France and Germany in 2014. It is only in France that price issues continue to be of little consequence now and in 2020. This is also the case for citizens in Luxembourg and Belgium.

The respondents in Germany and Belgium mostly rated the 2014 and 2020 price policy as “more bad than good”. Only in Luxembourg was price stability deemed “more good than bad” today and in 2020, if you ignore the worsening rating given by experts in Luxembourg. The French experts expect the rating to improve to “more good than bad” by 2020.

CONCLUSION: Prices will have an enormous influence on energy transition in the next several years. In this same context, consider that nearly one citizen and expert in seven expects an extreme spike in energy prices in the near future.

“Infrastructure”:

Mostly of secondary importance - infrastructural facilities remain “more good than bad”.

Infrastructure figures are of primary significance in 2014 for the German, Belgian and Luxembourg experts. The “infrastructural framework” in 2020 is very important to the citizens of Luxembourg and France and to the Belgian experts. Except for the Belgian experts (“more bad than good”), the survey respondents rate the infrastructural facilities in their countries “more good than bad” at present and in the future.

Again with the exception of Belgian experts, respondents are confident that the security of supply in their countries can also be guaranteed in 2020 – and this in knowledge of the fact that alternative energies can only provide fluctuating volumes of energy.

In Luxembourg, Germany and France, the experts place the “use of available space for energy supply” at the top of their list of priorities in 2014. All three countries agreed with their rating of “more bad than good”. Only the German experts expect this area to improve to “more good than bad” by 2020. The exception is Luxembourg. While the experts viewed the use of available space as of primary significance in 2014, the citizens of Luxembourg find it highly relevant for 2020. However, this was no longer the case for experts in Luxembourg. For both periods, the respondents in Luxembourg rated this “more bad than good”. In Belgium, the use of available space was only found to be important for the citizens in 2014, but not for the experts. Here, however, the experts are convinced that it will become in-

creasingly significant by 2020. While the citizens gave “more bad than good” ratings for both periods, the Belgian experts expect this area to improve to “more good than bad” by 2020.

CONCLUSION: The governments and energy supply companies cannot be satisfied with these ratings. Several billion more will have to be invested year after year to expand capacities and grids. Grid expansion and progress in energy storage are indispensable prerequisites for managing the energy transition.

“Application and use of new energy forms”: Belgium notwithstanding, of lesser importance today and in the future.

Nearly all experts stated the area of “application and use of new energy forms” was less important. Belgian experts give this area primary significance for 2014 and 2020, while the Belgian citizens only consider it so for 2020. The citizens and experts feel the performance of their countries in 2020 will earn the rating of “more good than bad”. In contrast, German and Belgian citizens and the Belgian experts gave their countries a rating of “more bad than good” for 2014, while all other respondent groups rated it “more good than bad”.

There is no other action area with as many country-specific differences with respect to the rating of individual measures as this one. The German, French and Belgian experts and citizens consider sufficient availability and wide-ranging possibilities for using “alternative sources of energy” to be influential factors of primary importance. The Luxembourg experts and citizens find the greater “prevalence of electric cars” to be an important promoter for the energy transition. No country rates the importance of “energy-efficient thermal insulation” in 2014 as highly as in Belgium. The French citizens find the “contribution of citizens” and the “contribution of industry to

saving energy” to be the central promoter of the energy transition in 2014.

CONCLUSION: The survey respondents are optimistic that the new energy forms and concepts will be implemented better, faster and more comprehensively in the future than to date.

Key role for research and development.

Construction companies, politicians, private households, business and industry, and energy suppliers are not strong players.

We asked which players are most strongly promoting the energy transition. Research and development (R&D) takes the strongest key role for 50% of the surveyed experts and 37% of citizens on average. In Luxembourg, this was felt even more strongly by 63% of experts and 51% of citizens.

The other players are less important. Construction companies do not represent important players. Only 25% of all experts and 17% of citizens give these companies a “more strong than weak” role. On average, only 19% of all citizens and 24% of experts consider politicians to have a relatively strong influence. A minor one in five experts and citizens on average believe that private households play a key role in implementing the energy transition. Solely 20% of experts and only 17% of citizens in all countries see private business as important trailblazers. On average, only one in two experts and citizens view energy supply companies as strong players.

CONCLUSION: The energy transition cannot succeed without research and development. The complete restructuring of the energy supply system requires well-coordinated action by all participating players, even if their roles are valued differently by the survey respondents.

How far away are we from the triumph of smart homes and applications?

The second part of the study is focused on smart homes as a very promising growth market. According to Samsung, 45 million smart home systems will be installed by 2018. The annual market volume will then have increased to 80 billion euros.

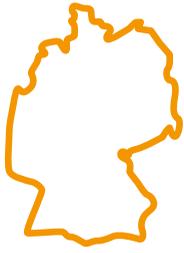
This is reason enough to survey citizens and experts about housing, living and building in the smart world of tomorrow. The central issues are as follows: How do things look with respect to modernisation plans and energy-saving renovations? What role will so-called smart applications, the intelligent control and assistance technologies, play? What speaks against home networking and what special advantages does it bring?

5. ENERGY-SAVING RENOVATIONS: COULD THE END OF ENERGY GUZZLERS BE IN SIGHT?

On average, one in two property owners have already undertaken energy-saving renovations.

Energy-saving renovations are in the hands of property owners. Of the property owners surveyed, 55% have already undertaken energy-saving renovations on average. This figure comes to 57% in Belgium and France, 54% in Luxembourg and 51% in Germany.

Energy-saving renovations will be implemented as part of a general construction trend no later than 2030. Nonetheless, only one fifth of German experts and citizens expect it to be established any sooner. In contrast, people are more confident in the other countries. In Luxembourg, 49% of experts and 25% of citizens expect energy-saving renovations to be implemented as early as 2020. In France, 32% of citizens and 26% of experts feel the same. The corresponding share of optimists in Belgium is 35% and 28%.



GERMANY



51%

of German homeowners have already undertaken energy-saving renovations on their buildings.



72%

of citizens in Germany consider state subsidy programmes necessary to promote the energy-saving renovation of buildings.



12%

of citizens in Germany feel well-informed about state subsidy programmes.



70%

of experts in Germany anticipate strongly rising energy prices.

75%

of German citizens expect strongly rising energy prices.



18%

of German experts expect a strong rise in the demand for smart applications by 2020.

12%

of citizens in Germany expect a strong rise in the demand for smart applications by 2020.

Reduction of energy consumption and increase of energy efficiency as most important reasons for energy-saving renovations.

The reduction of energy consumption and the related increase in energy efficiency are the most important reasons for citizens to initiate energy-saving renovations. At least 90% state this to be their main motivation in Luxembourg, France and Belgium. In Germany alone, the importance of increasing energy efficiency sank to 83%.

The increase in value is also deemed an advantage for nearly everyone.

Another advantage of energy-saving renovations is the increase in value. 61% of German, 57% of French but only 48% of the Luxembourg and Belgian experts view this to be an advantage of energy-saving renovations.

Savings from energy-saving renovations eradicated by increase in energy prices.

Over the last ten years, energy costs have turned into a "second rent". All the same, the energy consumption of a building can be reduced through energy-saving renovations. But does the cost of living also shrink? The answer of those surveyed is best described as "yes... and no". In Luxembourg and Belgium, 40% of citizens believe that the cost of living is lowered by energy-saving renovations to buildings. In France this figure is 37% and in Germany 29%. The experts are also divided over this question. In Luxembourg 41% of experts believe this is the case, in France 45%, in Germany 34% and in Belgium 31%.

There is a large consensus with respect to the question of whether energy prices will rise steeply. The citizen survey found that 75% believed this in Germany, 70% in France, 69% in Luxembourg and only 59% in Belgium. Among the experts, this is assumed by 74% in Belgium, 70% in Germany, 69% in France and 67% in Luxembourg.

Prosumers will not get their way until after 2020, and then slowly.

Prosumers not only consume energy but produce it as well and share any extra with others. In each country, about one fourth (27%) of the experts surveyed on average can imagine that they will already be in a position to share energy between 2020 and 2030. 38% of the experts feel this will not be possible until later than 2030.

Targets are too ambitious.

On average, 48% of the experts surveyed do not believe that all of the new buildings constructed in their country starting in 2020 will be low-energy buildings. In Germany this scepticism is even shared by 59%, in France by 51%, in Luxembourg by 44% and in Belgium by 41%.

According to the provisions of the EU directive concerning heating and cooling from renewable energies, every country must ensure that a specific portion of its renewable energies is used to provide heating and cooling to buildings. In France (54%), Belgium (39%) and Luxembourg (35%), the experts do not believe that their country will meet its specific targets by 2020. It is only in Germany that nearly one in two experts (48%) are convinced that the country will meet its target margin.

CONCLUSION: The housing of the future will make it possible for people to save energy and costs and increase the value of their property in new ways. However, there is reason to fear that these savings will be more than offset by sky-rocketing energy prices. Nonetheless, energy-saving renovations will become a general building trend by 2030. Prosumer activities are not expected to spread widely until after 2020. Experts find the EU targets for the transition to low-energy buildings and to heat supply through renewable energies to be overly ambitious.



FRANCE



57%

of French homeowners have already undertaken energy-saving renovations on their buildings.



75%

of citizens in France consider state subsidy programmes necessary to promote the energy-saving renovation of buildings.



9% of citizens in France feel well-informed about state subsidy programmes.



69%

of experts in France anticipate strongly rising energy prices.

70%

of French citizens expect strongly rising energy prices.



32%

of French experts expect a strong rise in the demand for smart applications by 2020.

26%

of citizens in France expect a strong rise in the demand for smart applications by 2020.



BELGIUM



57%

of Belgian homeowners have already undertaken energy-saving renovations on their buildings.



70%

of citizens in Belgium consider state subsidy programmes necessary to promote the energy-saving renovation of buildings.



18%

of citizens in Belgium feel well-informed about state subsidy programmes.



74%

of experts in Belgium anticipate strongly rising energy prices.

59%

of Belgian citizens expect strongly rising energy prices.



33%

of Belgian experts expect a strong rise in the demand for smart applications by 2020.

20%

of citizens in Belgium expect a strong rise in the demand for smart applications by 2020.



LUXEMBOURG



54%

of Luxembourg homeowners have already undertaken energy-saving renovations on their buildings.



80%

of citizens in Luxembourg consider state subsidy programmes necessary to promote the energy-saving renovation of buildings.



13%

of citizens in Luxembourg feel well-informed about state subsidy programmes.



67%

of experts in Luxembourg anticipate strongly rising energy prices.

69%

of Luxembourg citizens expect strongly rising energy prices.



33%

of Luxembourg experts expect a strong rise in the demand for smart applications by 2020.

20%

of citizens in Luxembourg expect a strong rise in the demand for smart applications by 2020.

6. OBSTACLES TO ENERGY-SAVING RENOVATIONS

State subsidies indispensable, but utilisation crippled by lack of awareness - energy passes remain mostly unknown.

State subsidy programmes are necessary for promoting the energy-saving renovation of buildings. 80% of the citizens in Luxembourg, 75% in France, 71% in Germany and 69% in Belgium agree.

On average, 27% of the property owners surveyed used state subsidies for heat insulation, 18% for modernising their heating system.

However, there is a broad information deficit among the citizens. In Germany, 64% felt uninformed about state subsidy options, in France 61%, in Luxembourg 57% and in Belgium 47%.

When asked for the main reason for not undertaking energy-saving renovations, the most frequent response was the high costs. In France, 86% of the citizens were frightened off by the high costs, in Luxembourg 81%, in Belgium 80% and in Germany 76%. Another nearly equally important reason from the perspective of the respondents is the insufficient state subsidies. This assessment was shared by 81% of the citizens in France, 70% in Belgium, 69% in Luxembourg and 67% in Germany. The third most important reason given by all countries was the unprofitable price/performance ratio. This was found lacking by 70% of the citizens in France, 68% in Luxembourg, 67% in Germany and 62% in Belgium.

Few renters are aware of energy passes as proof of the energy efficiency of a building. 54% of the citizens of Belgium, 51% in Germany, 42% in France and 35% in Luxembourg do not know whether the building in which they rent an apartment has been issued an energy pass or not.

Independent energy advisers enjoy the most trust.

Who do the citizens trust most? On average, 49% trust independent energy advisers most (Luxembourg 57%, Germany 50%, Belgium 46%, France 41%). They are followed by public and state consulting agencies, which receive an average of 42% of all citizen votes (Luxembourg 53%, France 44%, Belgium 37% and Germany 31%). Architects manage an average approval rating of 38% (but approval in Germany is only 29%). Only 32% of the citizens in Luxembourg and 20% in Germany, but on average 35% of the citizens in the other countries would want someone from the energy supply companies to advise them. 22% of the respondents would prefer to turn to a building contractor for this reason.

CONCLUSION: It is important to explain the personal advantages to the consumers and to convince them of the energy-saving impacts. Politicians have to better inform citizens of state subsidy programmes. The existing information and communication deficits must be lessened through targeted PR campaigns. The best central brokers for information are the independent energy advisers, who are the most competent.

7. HOW FAST WILL SMART APPLICATIONS CHANGE OUR LIVES?

The possible uses of smart applications, the intelligent control and assistance technologies, are manifold. As a technological aide, they take over some of the daily housework. The house technology can be controlled via internet using a simple mobile end device. The home network allows older people to lead mostly autonomous lives. In the future, smart applications will analyse the needs of residents and use this information to propose ways of better mastering daily work.

Breakthrough by 2030.

33% of experts in Luxembourg, 32% of experts in France and 29% of experts in Belgium anticipate a strongly rise in the demand for smart applications by 2020. The populace, who has to finance this technology, is somewhat less optimistic. In Luxembourg (20%), France (26%) and Belgium (28%), barely a quarter hold the same expectation. In contrast, the Germans are very pessimistic about this issue. Only nearly one in five experts (18%) and solely a good one in ten citizens (12%) can imagine the demand increasing by 2020. On average, it is the opinion of 42% of all experts, even one in two in Luxembourg, that smart applications will catch on by 2030. The citizens, at 34%, are on average somewhat more hesitant, though the citizens of Luxembourg show the most confidence at 41%. Smart applications will catch on: more slowly in Germany than in the other countries.

More experts than citizens convinced of the benefits.

63% of the experts in Luxembourg believe that smart applications will make life easier. This opinion is shared by 61% of the French, 55% of the German and 46% of the Belgian experts. The citizens are less convinced of the benefits. While 55% of French citizens take the same view, only 45% believe this in Lux-

embourg, only 44% in Belgium and a very low 40% in Germany.

Will the use of smart apps save energy? "Yes", say 77% of the experts in Luxembourg, 61% in France, 58% in Germany and 51% in Belgium. A good half of the populace in Luxembourg (52%), in France (49%) and in Belgium (46%) expect energy savings through smart applications. Only the people in Germany are somewhat more sceptical (40%).

Security-mindedness and technological dependence carry more weight in professional circles than among citizens.

On average, 55% of all experts and 48% of all citizens worry that their data is not secure enough. This security-mindedness is greater in professional circles. The greatest reservations are found among the German experts at 58% and the French citizens at 53%, the least concern among the Belgian citizens at 42% and the Belgian experts at 52%.

A button allowing people to turn off the smart applications when necessary is desired by 66% of the citizens in France and 62% of the citizens in Luxembourg. This wish is shared by 54% in Germany and 51% in Belgium. The distrust is far more wide-spread among the experts. It is greatest in France at 71% and in Belgium at 65%. Only 58% of the German experts and 59% of the Luxembourg experts are concerned in this regard.

CONCLUSION: The enormous potential of the home networking market of the future is undisputed. It is important to explain the personal advantages of smart home products to potential customers and to convince them of the benefits. There is also a need to improve the trust in those who provide smart application solutions. Confidence in the new technology can be increased if data security can be guaranteed for the protection of people's private domain.

And in the future...

A big thank you from the entire TNS Group to all survey respondents in Luxembourg, Germany, France and Belgium and to the participants in our expert workshops. I am sincerely grateful to the Enovos project team and to everyone else who participated in this unfailingly constructive collaboration.

I am especially pleased that Enovos was able to work together with the TNS Group to create the ENOVOS **READINESS INDEX** as a yardstick and international benchmark which will continue to show how much progress the countries have made toward the energy transition. The study results show which levers need to be placed in which positions to ensure a successful energy transition. This report gives decision-makers in the realms of politics, business and science an overall picture of all the critical factors - including those influencing the building and housing of tomorrow's smart world. The stakeholders know the problems they have to solve and that only coordinated action among them - with knowledge of developments across Europe - will spell success.

There's a lot to do. Let's get to it!

Yours sincerely,

A handwritten signature in black ink that reads "S. Graumann". The signature is written in a cursive, flowing style.

Dr. Sabine Graumann

SURVEY FACT FILE

Methods

Online-interviews in Luxembourg, Germany, France and Belgium

Survey period

26 June 2014 through 28 July 2014
Survey in German, French, Luxembourgish, Dutch

Basic demographics of the surveyed population

NUMBER OF PERSONS SURVEYED:

- Belgium: 1,003
- Germany: 1,004
- France: 1,002
- Luxembourg: 999

WEIGHTING VARIABLES:

- country
- region
- age and gender

Basic demographics of the surveyed experts

SELECTION OF EXPERTS:

Experts were personally invited to participate based on their knowledge and experience in the topics from the countries and networks of project partners. The expert team was composed as follows:

- real estate industry: construction, installation and heating engineering, electrical systems for residential buildings, electricians, tradespersons
- housing: building and property managers, real estate brokers, architects, housing construction, engineers, structural and civil engineering, building sector, planners (urban planners), building owners, facility managers
- energy industry: energy suppliers, energy service providers, electricity producers, grid operators, air conditioning system manufacturers, electrical machinery and appliance manufacturers

- representatives of other expert networks: For each of the energy, real estate and housing industries: relevant societies and associations, organisations, business consultants, universities and professors, and relevant state ministries

Composition of expert interviews

531 EXPERT INTERVIEWS

IN THE TOPICS OF:

- energy transition
- drivers of and barriers to energy transition
- achievement of target marks set in energy area
- smart applications
- energy-saving renovations

EXPERT INTERVIEWS

BROKEN DOWN BY COUNTRY:

- 29 in Belgium
- 196 in Germany
- 239 in France
- 67 in Luxembourg

WEIGHTING VARIABLES:

- country
- area of industry

SURVEY CONTENT:

- 3 questions evaluating energy transition
- 18 items in the area of drivers of and barriers to energy transition
- 8 questions about achievement of target marks
- 37 questions about energy-saving renovations
- 14 questions about smart applications

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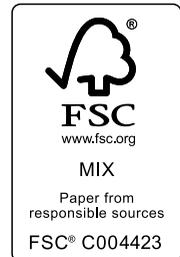
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in Luxembourg and surveying populace
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This summary may also be requested in German and French.
The entire study is available in German and French.



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