

The Energy Transition Chronicles



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Energy Cities provides local authorities with support for implementing their own energy transition process. The *Proposals for the energy transition of cities and towns* (www.energy-cities.eu/30proposals) are illustrated with around a hundred of inspirational examples from all over Europe. In this document composed of five case reports, Energy Cities goes further and tells the tale of energy transition success stories. Because it is important to show that energy transition is “possible”. Why, how, with whom, for what results? We interviewed local players and decision-makers to find out more. Here are their stories...



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THE “ENERGY REBELS” OF SCHÖNAU (GERMANY) OR HOW A COMMUNITY COOPERATIVE BECAME A GREEN ELECTRICITY PROVIDER





The town

Schönau im
Schwarzwald - Germany
2,314 inhabitants



Emblematic figures

Ursula and Mickael Sladek, the
instigators of the community initiative

Key figures

56% is the score obtained by the community association in the 1991 referendum

8.7 million Marks, i.e. around 4.5 million euros, is the exorbitant price set by the electricity supplier for the network

2 700 is the number of cooperative members in 2012

Milestones

1986 Chernobyl nuclear disaster – Establishment of the “Parents for a nuclear-free future” association

1990 Failure of cooperation with the electricity supplier – Establishment of a company to take over the grid

1991 The takeover bid is rejected by the town council – Citizens’ initiative referendum in favour of the association – The town council’s decision is invalidated

1993 The company presents its energy concept

1994 Expiry of the electricity concession – Establishment of a community energy cooperative (EWS) – Municipal elections

1995 The new town council grants the electricity concession to EWS

1997 EWS hires a CEO and officially takes over the town’s electricity supply

1998 EWS sues the former energy supplier for fraudulent estimation of the selling price – Liberalisation of the electricity market

2005 Ruling in favour of EWS: the takeover price is set at 3.5 million marks

2012 EWS supplies 100% renewable electricity to over 142,000 customers throughout Germany

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KEY POINTS TO REMEMBER

The inhabitants of Schönauf, a small town in the Black Forest in south-west Germany, demonstrate particular awareness of the energy issue. The Chernobyl disaster in 1986 transformed this awareness into a commitment: from now on, their future would be nuclear-free. A group of citizens set up the “Parents for a nuclear-free future” association, whose fun events marked it out from other antinuclear movements. A meeting with KWR, the regional monopolistic electricity company which owned the grid, came to an abrupt end as the company showed little interest in the environmental ambitions and concerns of the community organisation. The association was seeking an alternative solution, but the town was divided on the issue of the feasibility of generating and distributing its own electricity. The association decided to become an electricity supplier by setting up an energy cooperative (EWS) and learned the business with the support of experts. The path they followed proved to be full of pitfalls and it took ten years and two citizens’ initiative referendums for the Schönauf town council to grant the association the concession. The community electricity cooperative EWS became the first power operator to supply 100% renewable electricity in Germany, supplying the local grid at first and then the whole country after the electricity market was opened up in 1998.

The electricity sold by EWS is produced by generation units owned by citizens and purchased according to strict, specific criteria. The association also subsidises the installation of renewable electricity generation units. It manages and builds CHP units, PV and wind farms, as well as hydroelectric facilities. By 2012, EWS had 2,700 members, 142,000 customers throughout Germany and had already subsidised 2,150 renewable energy production units.

The community energy cooperative created a momentum and is now the pride of the town. EWS supports the local economy by creating jobs, business activities and tax revenues for the local authority. The town council of Schönauf has therefore become highly aware of this issue and has adopted a sustainable development political strategy. The group of citizens behind this adventure and led by Ursula and Michael Sladek (now managing the cooperative) showed tenacity and persuasion and used all the democratic tools at their disposal to achieve this success.

PART 1 – THE SCHÖNAU’S ENERGY TRANSITION CHRONICLES

1. SCHÖNAU IM SCHWARZWALD



Schönau is a small town of 2,314 inhabitants¹ in the heart of the Black Forest Nature Park, in Southern Germany. This peaceful town is also a thermal spa. Mining and forestry and, later, watch-making used to be the main activities and have left their marks. A number of companies specialising in metalworking, especially metal-brush making, still bear witness to this industrial past. Schönau is known for its “energy rebels” who established EWS (*Elektrizitätswerke Schönau*), a community energy cooperative in 1996. This was the

result of a long process and many stormy debates on the town’s energy supply. The energy cooperative is now a source of dynamism and pride for the council and local businesses. Schönau has become the symbol of a decentralised, democratic energy system.

2. ELECTRICITY SUPPLY AS SEEN BY CITIZENS

2.1 THE BIRTH OF A COMMUNITY INITIATIVE

In the post-war period, local authorities looked at ways to delegate management of the power grids they had helped build at the beginning of the 20th century. At that time, many decided to sell their grids to the energy suppliers, who were already their contractors, thus reinforcing their monopoly in the market. In the 1980s, they became aware of the negative consequences of selling off their distribution grids: they had limited, not to say inexistent, rights over energy issues. The energy groups were the sole decision-makers when it came to exploiting energy sources, whether nuclear, fossil or renewable sources and showed little interest in environmental issues. In view of this situation many local authorities decided to regain control of their distribution grids.

In Schönau, the 1986 Chernobyl disaster triggered a change in people’s opinions on energy supply. This nuclear tragedy and the subsequent fallout from the radioactive cloud deeply worried the population. Tired of waiting for politicians, energy suppliers and the industry to address the threat posed, in their opinion, by nuclear energy, citizens got together to create the “Parents for a nuclear-free future” association (*Eltern für atomfreie Zukunft*, EfaZ e.V.), committed to promoting “clean”, carbon- and nuclear-free electricity.

As a first step, the association - which included the town’s doctor, his wife, the policeman, the notary, teachers, craftspeople and others - organised fun events, such as contests, advice and tips for saving energy or concerts featuring the *Wattkiller* band on a regional tour. This presence enabled the association to stand out from more alarmist, less positive antinuclear groups and to gain in popularity. It then

¹ Data obtained in early 2014.

established a company² to support the reactivation of small hydro units and to encourage citizens wishing to invest in small PV or CHP units. The association also approached KWR (*Kraftübertragungswerke Rheinfelden*), the company supplying electricity to Schönau and its region, to discuss possible cooperation avenues for the production of greener electricity. KWR, however, showed little interest in the inhabitants' requests and rejected any form of cooperation.

In 1990, the association estimated that the situation was giving cause for concern. The electricity concession contract between Schönau and the regional energy company KWR was due to expire in 1994, but fearing the development of the association, KWR made moves to prolong the concession four years before its contractual term. KWR offered 100,000 marks (ca. 51,000 euros) to the town council to prolong the concession with immediate effect. The Schönau electricity market had no major economic importance for KWR, but it wanted to strike a symbolic blow and preserve its monopoly in the region.

The association persevered and requested a debate on the energy issue. Impassive, KWR refused the association's three demands: stop supplying electricity from nuclear sources, pay more for renewable energy and start an energy saving programme. The association set itself the objective of finding an alternative supplier to KWR. But despite their efforts, the town council appeared willing to accept KWR's offer: a lack of financial resources and an unemployment rate of over 10%³ made KWR's financial proposal extremely attractive whilst alternative solutions seemed utopian.

2.2 TAKING OVER THE POWER GRID TO GAIN CONTROL OF THE TOWN'S ENERGY FUTURE

However, the association did not give up and established *Netzkauf Schönau GbR* in November 1990, a civil law partnership with the stated aim of taking over the grid. Through *Netzkauf*, the association offered the town council the same amount as KWR (100,000 marks) for them not to prolong the concession with the electricity supplier before the expiry of the contract. This was aimed at obtaining a four-year delay and sufficient time to organise a genuine debate on the town's energy supply policy. If no agreement could be reached with KWR, the citizens hoped to convince the town council to set up a municipal energy company. Many inhabitants still remembered the municipal station which had supplied the town up to 1975, when the grid was sold to KWR. In order to collect the 100,000 marks needed, 280 citizens committed themselves to raising the money in the future. KWR put added pressure on the association by increasing its offer by 55,000 marks (ca. 28,000 euros), but the association did not back down and brought its offer into line.

However, the association's offer failed to convince the councillors. In 1991, to everybody's surprise, the offer was declined by the town council and KWR was granted immediate prolongation of the concession.

The EfaZ association, led by Ursula and Michael Sladek, persevered and refused to give up. They asked for a referendum to be organised to allow the inhabitants to decide on the prolongation of the concession to KWR. The period before the referendum saw both sides waging a fierce battle through relentless communication campaigns. KWR adopted a strategy aimed at discrediting the association, forecasting catastrophic consequences were the grid to fall into municipal hands with two main downsides: an unreliable electricity supply and higher prices. EfaZ knew that each vote would be decisive and decided to

² Elektrizitätswerke Schönau, "Vom Kampf um das eigene Stromnetz – Vom Rebellen zum Ökostromanbieter", 2006, page 1

³ DER SPIEGEL 21/1996 "Die Rebellen von Schönau": www.spiegel.de/spiegel/print/d-8926364.html

run a locally-focused campaign. In October 1991, the association won the referendum with 56% of the votes. The 75% turnout showed how important the issue was to the Schönauf population.

The decision of the town council was thus invalidated and KWR did not benefit from an early prolongation of the concession. This victory saved a considerable amount of time. The national media started to turn their attention to Schönauf and nicknamed the association members “the electricity rebels”. Seeing no suitable outcome to their conflict with KWR and the town council, the “rebels” decided that they should become electricity suppliers. But to do so, they had to take over the Schönauf power grid from KWR. The project was taking shape. In 1993, *Netzkauf* presented its energy project with the help of energy experts who had joined the fray.

2.3 THE SCHÖNAUF POPULATION IN FAVOUR OF THE COMMUNITY ENERGY COOPERATIVE

KWR wanted at all costs to prevent *Netzkauf* from taking over the power grid. In Germany, energy corporations feared that the initiative might set an example to other municipalities and trigger a snowball effect. German legislation is quite clear: if a local authority does not extend the concession, the incumbent supplier must quit. KWR had no other legal option and decided to play its last card: ruining the takeover bid by setting an excessively high price. KWR set the price at 8.7 million marks (ca. 4.5 million euros), an exorbitant price for *Netzkauf* which had assessed the grid at 3.9 million.

Netzkauf then considered taking legal action to establish the grid’s real price. However the association knew that such proceedings could block its project for about ten years, knowing that electricity concessions are usually granted for a period of twenty years. Such an opportunity to take over the grid and become a supplier might not present itself for a long time. *Netzkauf* therefore decided to pay the high price of 8.7 million marks whilst starting proceedings to have the difference refunded. Then came the huge challenge of raising this astronomical amount.

In addition to *Netzkauf*, the company established to acquire the power grid, the EfaZ association also set up the community energy cooperative EWS (*Elektrizitätswerke Schönauf*) in 1994 to serve as the energy supplier. EWS’ main shareholder was *Netzkauf*, which already had over 650 citizen shareholders. EfaZ also concluded a support contract with the municipal energy company of Waldshut-Tiengen, a neighbouring municipality, so that EWS could benefit from its support and expertise. The association then held all the cards to answer the call for tenders for the concession of the Schönauf power grid.

Meanwhile, municipal elections took place in 1994 and pro-EWS councillors became the majority. EWS seemed to be in good position to be granted the concession, which indeed was awarded to the community cooperative on 20th November 1995.

But the battle was not over. Opponents of EWS, unhappy about this decision and expressing strong differences of opinion, saw a last resort in a second referendum. This move was led by the CDU (Christian Democratic Union) and aimed at invalidating the granting of the concession to EWS. The pre-referendum communication campaign was even fiercer than the 1991 one and was marred by insults and libelling.

On 10th March 1996, the day of the referendum, EWS again won, this time with 52.4% of the votes and an unprecedented turnout of 85% - above the turnout for the general elections to the Bundestag⁴. KWR finally admitted defeat but expressed its serious concern. According to them, Schönaue was exposing itself to very serious risks such as power cuts and continuous price increases, with local citizens and businesses being the first victims.

2.4 TAKING OVER THE POWER GRID: A DISPUTE INVOLVING MILLIONS OF MARKS

The selling price of the grid then became a major issue: KWR had set it at 8.7 million marks. In the association's view, the price was disproportionate. In November 1996, KWR recognised they had overvalued the price and presented a new offer at 6.5 million after revaluation. The company justified the difference by the fact that the first valuation was based on a power cable network measuring 33 km instead of the actual 22 km. The expert valuation provided by *Netzkauf* was based on the correct figures but was ignored by KWR, drawing criticism in the press. The newspaper *Badische Zeitung* described the situation as "embarrassing". The association conversely gained credibility.

EfaZ still believed the new KWR offer to be overstated by 2 million. But faithful to their "buy first, claim second" strategy, they raised the amount demanded. The takeover project received wide-ranging support in Germany: the community bank *GLS Bochum* set up a specific 2.4 million mark fund (ca. 1.2 million euros). Direct contributions from individuals country-wide resulted in 1.7 million marks being collected. The rest of the money was raised through an ingenious fund-raising campaign called "*Strörfalkkampagne*" which collected 1.6 million marks. To start the campaign, the association asked communication agencies to design a nation-wide fund-raising campaign free of charge. Several agencies agreed and the association chose the slogan "*Ich bin ein Störfall*" (I am an accident) suggested by one of the biggest communication agencies in Germany. The campaign was a huge success: newspapers published free ads, cinemas screened the campaign, and it was broadcast on television and radio channels. NGOs like Greenpeace, environmental protection associations (BUND and NABU) and WWF, to mention just a few, contributed to the campaign. The Bochum foundation for new energy sources encouraged German towns and cities to follow the example of Schönaue.

In 1997, surprised by this national media coverage, KWR once again revised the price for the grid downwards to 5.7 million marks. The company justified this reduction by "inaccuracies in the expert valuation".

EfaZ finally achieved its goal in April 1997 and hired a CEO. Then on 1st June at noon, the cooperative officially took over the town's power grid and energy supply management. In 1998, in line with its strategy, EWS sued KWR in the Freiburg court and claimed the reimbursement of 1.8 million marks. EWS based its claim on the result of its own expert valuation which set the value of the grid at 3.9 million. The ruling given in 2005 finally set the price for the grid at 3.5 million marks (1.77 million euros).

2.5 EWS MAKES A NAME FOR ITSELF IN THE MARKETPLACE

Over the next few years, the activities of the young EWS cooperative were closely scrutinised. Would it be able to meet its responsibilities and achieve its ambitions? EWS was the first supplier to deliver 100%

⁴ Elections to the Bundestag: German MPs are elected for four years by direct universal suffrage.

renewable electricity to the 1,700 customers of the Schönauf grid. The electricity produced had to meet extremely strict green criteria. From the start, the emphasis had been laid on a rational use of energy and increasing the use of renewable energy sources. As a consequence, “clean” electricity obtained a higher price.

The opening-up of the electricity market in 1998 created new opportunities. Henceforth, customers could choose their own supplier and EWS could supply electricity to the rest of the country. In four years, 12,000 customers switched supplier to EWS, which set up over 100 small production units throughout Germany. By the end of 2012, the cooperative had over 142,000 customers, including households and hundreds of small and big companies (like Ritter Sport and DM), and institutions.



In 2009, in a market in constant flux, EWS adapted and diversified its missions. The legal structure was changed: *Netzkauf EWS eG*, the civil law partnership, was transformed into a cooperative and became the owner of EWS. The context made integrating new members easier and increased the cooperative’s scope. EWS responded and won a call for tenders for the Schönauf gas concession. Customers in Baden-Württemberg and, since 2010, Bavaria can now be supplied with gas meeting strict green production criteria.

EWS attracted a following. The cooperative organised multiple training sessions to help its customers use less energy and get more involved in energy issues. The money thus raised was used to finance other community initiatives. On the occasion of a debate on the prolongation of nuclear plants’ service life, EWS launched a vast communication campaign on the “100 good reasons”⁵ for phasing-out nuclear energy. EWS is attentive to the changing energy policy framework as competition in the renewable energy sector is due to intensify following the announcement by the German government that all nuclear plants should be decommissioned by 2022.

3. RESULTS AND IMPACTS OF THE COMMUNITY ENERGY COOPERATIVE

3.1 EWS, A COMMUNITY COOPERATIVE IN CONSTANT FLUX

THE EWS COOPERATIVE TODAY

The EWS cooperative is the first German supplier to have offered a 100% renewable energy mix. With 2,700 members and capital of 21 million euros in 2012, EWS was the 3rd ranking independent green electricity supplier⁶ nationally with the highest solar energy share. Originally created as an antinuclear community movement nicknamed “the electricity rebels”, EWS has won several prizes. Two stand out: the prestigious Environmental Prize awarded in 2013 by the President of Germany, Mr Joachim Gauck, and

⁵ 100-GUTE-GRUENDE.DE: www.100-gute-gruende.de/index.xhtml

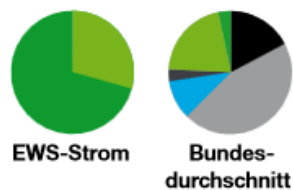
⁶ Ökostromanbieter: www.oekostrom-anbieter.info/oekostromanbieter/ews-schoenau-gmbh.html

the Goldman Environmental Prize, also called the “Nobel Prize for the Environment” awarded to Ursula Sladek in 2011 when she met Barack Obama at the White House.

The electricity supplied by EWS comes from production units owned by citizens. EWS purchases the electricity provided the facilities are less than 6 years’ old at the time of the contract. Coal, nuclear energy and oil are banned. The *Stiftung Warentest*⁷, the German consumers’ association, certifies that EWS applies a fair price and shows a strong commitment in its production standards that goes well beyond its “green certification” criteria. The cooperative also supports energy efficiency, awareness-raising and power unit construction projects and runs a subsidy programme from which 2,250 electricity production units had benefited by the end of 2013.

Individuelle Stromkennzeichnung 2012

■ Atomenergie	0,0 %
■ Kohle	0,0 %
■ Erdgas	0,0 %
■ sonstige fossile Energieträger	0,0 %
■ Erneuerbare Energien gefördert nach EEG	29,4 %
■ sonstige Erneuerbare Energien	70,6 %*
* davon 100 % Strom aus Neuanlagen	



Opposite is the EWS electricity mix compared to the national average. 29.4% of EWS electricity is produced from renewable energy sources as defined by the German Renewable Energy Sources Act⁸, against 20.8% for the national average. The rest -i.e. 70.6%- is produced from other renewable sources (new production units), against 3.5% for the national average. At the national level, the energy mix is composed of 45.6% fossil energy (coal) and 17.1% nuclear energy.

Proof of its success is the increase in membership, from 1,800 in 1998 to 142,000 in 2012, throughout the country. This increase had two peaks, one in 1998 with the opening-up of the electricity market, and the other in 2011, following the Fukushima disaster. To these figures must be added the 8,500 members with a gas supply contract. In 2012, EWS sold ca. 678 million kWh⁹ to its end customers and sub-distributors. The average energy use of an EWS household was 2,417 kWh in 2012, down 3% compared to 2011. By way of comparison, the average energy use of a German household was 3,473 kWh, i.e. 30% more. EWS is pleased to have such energy-aware customers.

The environmental balance is clearly positive. EWS generates zero nuclear waste and almost no CO₂ emissions, 2.1 g/kWh compared to 522 g/kWh at the national level¹⁰.

⁷ Stiftung Warentest: www.test.de

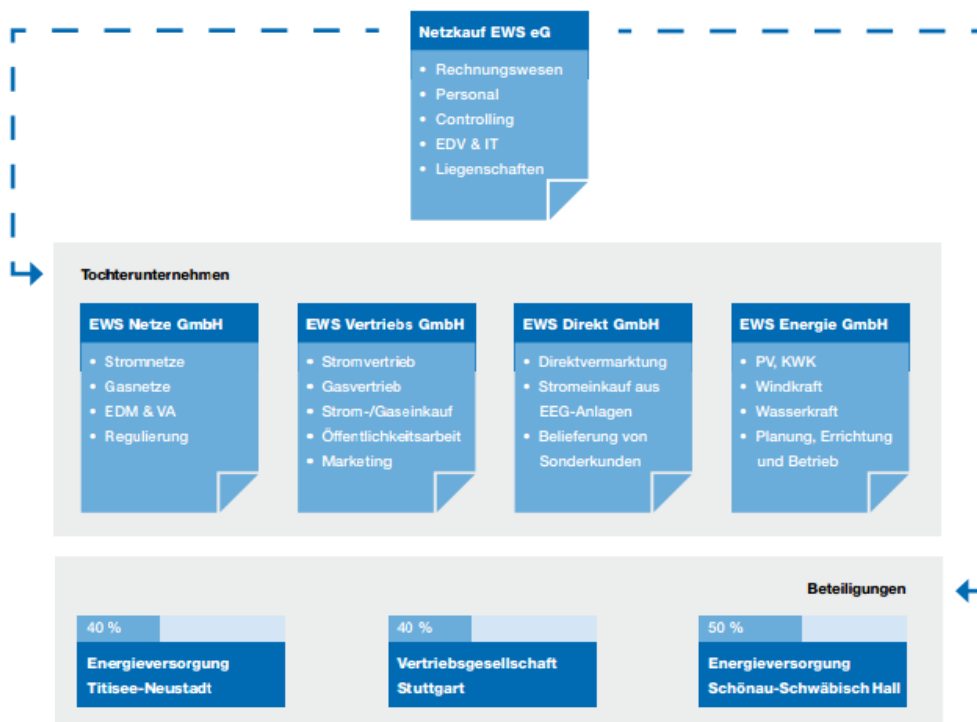
⁸ BMU: www.erneuerbare-energien.de/en/topics/acts-and-ordinances/the-eeeg-clearing-house/

⁹ Netzkauf EWS eG Geschäftsbericht 2012

¹⁰ CO₂ emission rate calculated on the basis of total electricity production

EWS'S STRATEGIC CHOICES

EWS is facing deep changes in the energy sector. The German political agenda stipulates that all nuclear plants should be decommissioned by 2022. The non-nuclear selling point will soon no longer be valid and competition is increasing. In this context, EWS must reinvent itself to remain competitive. It has started with its internal organisation: the *Netzkauf EWS* cooperative acts as the parent company, a sort of *holding*, to which a number of subsidiaries are attached that are incorporated as limited liability companies. These companies are responsible for selling, distributing and producing energy and for maintaining the networks. EWS buys shares in networks wishing to be supplied with green electricity.



EWS structure - Source: EWS

In 2012, EWS officially became a shareholder in the Stuttgart, Schönaus-Schwäbisch-Hall and Titisee-Neustadt municipal energy companies. The objective was not just to have an interest in these companies: as EWS Board members are now also on the Board of municipal companies, the objective for EWS is to support and advise these local authorities on the creation of energy companies and to support projects aimed at taking over municipal power grids. EWS is also active outside Germany through the REScoop network, whose aim is to promote community renewable energy cooperatives as real participatory models for local communities. As part of the REScoop 20-20-20 project¹¹, a baseline inventory of cooperatives in Europe has been carried out to gather information and share knowledge with newly established cooperatives.

¹¹ <http://rescoop.eu/fr/about-rescoop-20-20-20>

3.2 SCHÖNAU, A DEEPLY TRANSFORMED TOWN

EWS is not a municipally-owned company, as Schönau did not wish to buy shares in the cooperative. But it has deep local roots, even though it is now a nation-wide supplier. Mutual attentiveness explains the strong link between the municipality and the cooperative. The Mayor of Schönau, Peter Schelshorn, says that EWS shows greater involvement in the management and maintenance of the power grid than bigger suppliers and the town acknowledges that EWS has a positive economic, environmental and sociological impact.

From an economic point of view, EWS contributes to creating value in the local area. With its 93 employees, it is the 2nd largest employer in Schönau. It is the leading business tax contributor, a financial resource that enables Schönau to meet its municipal commitments and finance additional projects. The small town is also affected by urban migration and its population fell from 2,500 inhabitants in the 1990s to 2,300 in 2013. This movement mainly concerns young people who move to larger cities to study and work. EWS helps compensate this phenomenon by offering jobs.

From an environmental point of view, Schönau takes pride in being a “solar capital” with a PV nominal power of 1,759 watt-peak. This is largely due to the fact that EWS is also a resources centre for energy: it advises and guides citizens on energy efficiency, energy savings and the installation of renewable energy production units. Some companies are following suit, notably a chartered accountant who has specialised in energy or Frank Bürsten, a company which has installed a hydroelectric power plant for its metal brush manufacturing activities.

Every year, the town hosts an energy seminar organised by EWS, bringing international renown and recognition to the local area. It makes it its duty to “set an example”. The visit of the secondary school roof fitted with solar panels and that of the PV facility on the roof of the protestant church are a must! Anxious to go further in its action in favour of sustainable energy, the municipality decided to reduce its CO₂ emissions by replacing its street lighting lamps with LEDs between April and August 2013. As a result, electricity use for street lighting has dropped by 78%, thus avoiding 1,243 tonnes of CO₂ emissions over 20 years. This project was initiated in line with a Baden-Württemberg directive. Schönau once again stood out as a pioneer, as it was one of the first towns to take practical measures to apply this directive. The council also launched a debate on car-sharing and electric mobility in rural areas. Schönau is associating two local companies with this project: EWS, for the production of green electricity, and Heinzmann, a company specialising in the manufacture of electric motors.

From a sociological point of view, one must remember that 20 years ago, the population of Schönau was divided on the issue of the grid take-over. The citizens’ initiative referendums decided in favour of EWS but also highlighted a strong divide in this 2,500-inhabitant town. Some feared that Schönau would experience blackouts if EWS failed in its mission. But these fears rapidly melted away. Today, its former opponents support and encourage EWS and no one doubts the capabilities of the cooperative, which is now a source of pride for the population.

PART 2 – ANALYTICAL INPUTS

This part provides inputs for analysing the energy transition process in Schönau. It addresses the specific features of the Schönau process with the first section dedicated to the governance model and the second section to the action drivers.

1. THE GOVERNANCE MODEL, INTERCONNECTED PLAYERS AND ACTIONS

1.1 THE EWS COOPERATIVE

The community energy cooperative EWS was established in 1994 by a group of citizens - the “Parents for a nuclear-free future” association - itself created in reaction to the 1986 Chernobyl disaster. Leading the association were Ursula and Michael Sladek, housewife and village doctor, supported by a group of active citizens. They knew the local area and its inhabitants very well. The failure of the attempted cooperation with the regional energy company KWR prompted the association to react. Knowing that the municipality would not support a municipal company project and that KWR was pushing hard to prolong the concession contract, the group of citizens decided to become an electricity supplier and to take over the power grid.

The association managed to postpone the date of the re-granting of the concession by organising the 1991 referendum, prepared the tender and learned the electricity supplier business. Experts provided legal and technical assistance and made it possible to gather the required expertise. Among them were Dr. Peter Becker¹², an energy law expert at the Becker-Büttner law firm, as well as experts from the Aachen-based BET¹³ energy management consultancy and a chartered accountant specialising in energy companies.

The concession was finally granted to EWS in 1996 but they still had to take over the power grid. KWR overestimated the selling price, asking 8.7 million marks that was finally reduced to 3.5 million marks¹⁴ by a German court. EWS managed to raise the money thanks to the GLS¹⁵ bank, a decisive partner which set up a special 2.4 million mark fund. Established in 1974, GLS supports cultural, social and green projects and came into contact with EWS through an activist. From the outset, GLS found the community project attractive. In 1987, the bank had already financed a wind turbine project that other banks had rejected. The rest of the money came from direct contributions from private individuals and a national fund-raising campaign designed by one of the biggest communication agencies in Germany. EWS aroused a great deal of interest around a crucial issue: energy supply.

The association then had all the cards in hand: the know-how to operate as an electricity supplier, an appropriate structure with the community energy cooperative EWS, the Schönau concession contract and finally the local electricity grid. After ten years of relentless efforts, the cooperative finally became the first 100% renewable electricity supplier in Germany.

¹² Peter Becker, energy law expert: <http://energieanwalt.com>

¹³ BET consultancy: www.bet-aachen.de

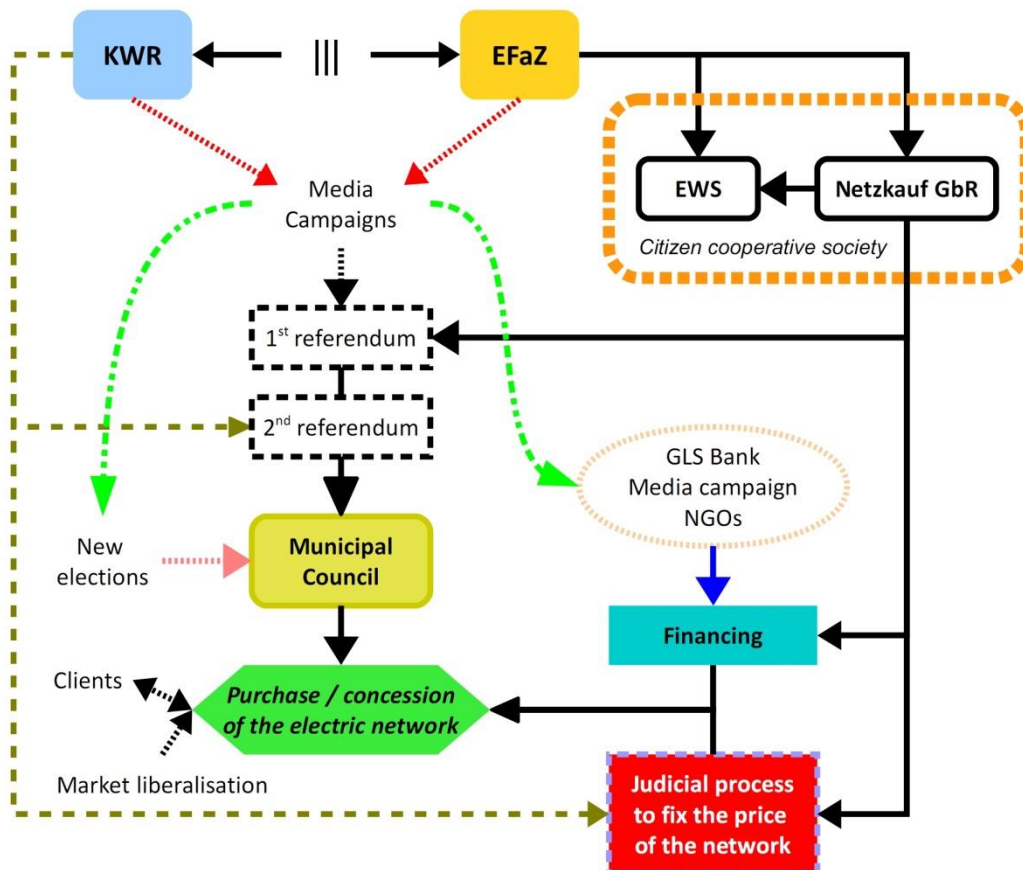
¹⁴ See Part 1

¹⁵ GLS bank: www.gls.de/privatkunden

Bernward Janzig: www.bernward-janzig.de/media/c4e44b7b180b3647ffff8651ac144225.pdf

1.2 THE ELECTRICITY SUPPLIER KWR

KWR supplied electricity to Schönau until 1997. The company owned the local power grid and had a monopoly in the region. KWR was “a big fish in a small pond” and paid little attention to the requirements of the “Parents for a nuclear-free future” association (EfaZ). They could, however, have worked together.



At that time, most of the electricity was already produced from renewable sources (ca. 60% of hydropower was injected into the grid). When KWR realised that the association was insisting on having a debate on the environmental impact of energy supply, they decided to avoid it at all costs. Of course, an electricity supply contract with a small town was not economically very important but the idea was to nip the debate in the bud so that it would not spread to other towns and grow into a threat for KWR. In 1991, the company offered 100,000 marks to the town of Schönau to prolong the concession contract with immediate effect¹⁶. KWR could not possibly imagine that EfaZ would persevere and manage to thwart their plan with a referendum.

When the town council granted the concession to EWS in 1995, KWR in turn asked for a referendum on the granting of the concession. Leaving nothing to chance, it decided to concentrate its efforts locally and opened a campaign office in Schönau. Its strategy was to discredit the association and raise fears among the population. They invoked catastrophic consequences for the town, with disruptions in the electricity supply and ever-increasing energy prices. But despite all this, KWR again lost the 1996 referendum.

¹⁶ See Part 1 – The Energy Transition Chronicles; section 2.3

Their final way of exerting pressure was the price demanded for the power grid, which they overvalued to ruin the association's plans. EWS, however, succeeded in raising the required amount with the support of the GLS bank and a fund-raising campaign. KWR was also surprised at the growing media attention the case attracted. Fearing that the matter would be referred to a court, KWR dropped the price several times, citing valuation errors, which resulted in strong criticism in the press. But after taking over the grid, EWS lodged a complaint and won the case in 2005, with the court setting a lower price in favour of EWS.

1.3 THE TOWN COUNCIL

The town council played a prominent role in the energy transition process as the granting authority for the electricity concession. When the town council sold its power grid in 1975, it waived all forms of participation in the town's energy supply. KWR was the only supplier in the region and the town therefore had no alternative but to grant the concession to KWR. In the 1990s, the unemployment rate rose to 10%. The town was in no position to oppose the giant KWR when it offered money to prolong the concession. The referendum, a direct democracy tool, played an essential part: with the town council in an impasse, it was the only way for the inhabitants of Schönau to have their voice heard and respected.

At that time, the town council was composed of three political groups with the Christian Democratic Union (CDU) as the leading party, followed by an "independent" list (Freie Wähler Vereinigung) and the Social Democratic Party (SPD). The CDU supported KWR. The independent list defended green positions and had a leader of the association, Michael Sladek, among its members. The 1993 municipal elections reversed the trend and the independent list became the dominant party. When in 1994 the town council had to decide on who the next concessionaire would be, the association had a majority of supporters and EWS was awarded the concession. Later in 1997, as a result of increased energy-awareness, the independent list won even more seats and obtained as many seats as the CDU and SPD combined.

1.4 "NATIONAL ECHO" STAKEHOLDERS

EWS first drew the attention of a few energy-aware individuals, mainly experts, and then the national media took an interest in this fascinating "David against Goliath" struggle, until the whole of Germany was able to follow the second referendum on TV, live from Schönau. Well-known companies like Ritter Sport supported their cause, communication agencies offered free concepts for the fund-raising campaign and environmental protection NGOs made contributions. This snowballing of interest by stakeholders and the media played an essential role in EWS's success.

2 ACTION DRIVERS

The EWS story may seem utopian. How could a community initiative in a small town of 2,500 inhabitants win its fight against an energy giant? The trigger was the Chernobyl nuclear disaster, which prompted the inhabitants to take their future into their hands, without waiting for political decision-makers to take action. This transition is the result of a complex interweaving of actions and players. But the foundation for this success is definitely the strong will and perseverance of the citizens.

2.1 KNOWLEDGE OF THE LOCAL AREA

The citizens who established the “Parents for a nuclear-free future” association live in Schönau¹⁷. Their strength lies in their knowledge of the area and its inhabitants. This clearly proved an advantage in the pre-referendum campaigns. They knew that each vote would count and they ran a very local-focused campaign based on door-to-door canvassing. They knew who the opinion leaders were in Schönau and were able to use this information to their advantage.

2.2 A LEADER OF THE MOVEMENT ON THE TOWN COUNCIL

Michael Sladek (see opposite with his wife Ursula), one of the association’s leaders, sat on the town council as an independent. This situation enabled the association to be kept informed of the council’s position and to make its claims and concerns heard. This resulted in sound knowledge of the democratic tools available, e.g. referendums.



2.3 A POSITIVE APPROACH

The association stood out from other, more alarmist anti-nuclear movements through its fun events. The energy saving competition, advice and tips and the music band contributed to its popularity. The association also established a company to support the reactivation of small hydropower units and encouraged citizens to install small CHP or PV units. Later on, the association decided to become an electricity supplier. In order to prove that its project was realistic, it had a PV unit installed on the roof of a house as well as a hydroelectric station in a company generating the electricity needed to cover its production. The association organised visits of the generation units for inhabitants and school children, thus enabling them to get a better understanding of renewable energy technologies and to see for themselves that the project was feasible.

2.4 CITIZENS’ INITIATIVE REFERENDUMS

Without the 1991 referendum, the town council’s decision to prolong the concession to KWR could not have been cancelled. The whole population of Schönau was invited to express their opinion on the issue of the electricity grid concession. The association thus obtained additional time to learn the electricity supplier business and create an appropriate structure (the EWS cooperative) to ensure democratic energy management. The result of the referendum showed strong community support, which strengthened the cooperative in its fight.

2.5 FUND-RAISING CAMPAIGN

Part of the money necessary to acquire the power grid was collected through the GLS bank and its specific fund. To finance the remaining part, the association was bold enough to ask communication agencies to design a fund-raising campaign for free. Luckily, one of the biggest communication agencies offered its

¹⁷ See Part 2 – Analytical inputs

help. The campaign proved extremely successful and made it possible to finance the acquisition of the grid.

2.6 A FAVOURABLE ENERGY POLICY FRAMEWORK IN GERMANY

In 1998, following the opening-up of the electricity market in Germany, German citizens could choose their electricity supplier and many were attracted to EWS's "green electricity" offer. For EWS, this opening-up was beneficial in that it shook up the various suppliers' knowledge of the market. Everyone was put on an equal footing as all the suppliers had to come to terms with the new market rules. EWS, a newcomer in the sector, was no longer a one-off. The political context also became more favourable: the federal government announced that all nuclear plants would shut down by 2025 and adopted the Renewable Energy Sources Act¹⁸, enacted in 2000, which introduced a mandatory feed-in tariff.

¹⁸ BMU: www.erneuerbare-energien.de/en/topics/acts-and-ordinances/the-ee-g-clearing-house/

PART 3 – RESOURCES

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Town of Schönau im Schwarzwald, <http://www.schoenau-im-schwarzwald.de>

Photo credits: © EWS

VÄXJÖ (SWEDEN), A “BIO-ECONOMY” FOR ALL





The City

Växjö
Sweden
85,000 inhabitants

© photo Mats Samuelsson

Local key players



Bo Frank, Mayor (left)



Henrik Johansson, coordinator of the city's environmental department

Key figures

2.7 is the number of tonnes of CO₂ per capita emitted in 2012 (EU average: 7.01 tonnes)

88% is the proportion of renewable energy in the local energy station supply mix

73% is the economic growth rate increase between 1993 and 2010

2,000 is the number of local jobs created in the private sector between 2011 and 2014

Milestones

1960 The city council is alerted to the condition of the lakes (eutrophication) and launches a conservation programme

1970 The oil crises prompt the municipal energy company to seek another source of energy: biomass

1995 Växjö cooperates with the NGO *Swedish Society for Nature Conservation* to mobilise local stakeholders

1996 The city council adopts the “fossil fuel free” objective

1997 Creation of the Investment fund for environmental protection by the Swedish government

2006 The city launches its Environmental Programme, which replaces the Local Agenda 21

2010 Revision of the Environmental Programme – the city sets 2030 as the deadline for becoming “fossil fuel free” – the focus is set on transport

2012 The city reduces its CO₂ emissions by 41% compared to 1993

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KEY POINTS TO REMEMBER

The municipality of Växjö, in Sweden, set itself a challenge very early on: to become a fossil fuel free city. This objective was the result of a long-term process: it began when a few measures, which through their success left a deep impression on the elected representatives, thrust the city down an energy and then environmental transition path. The process works through close cooperation between the political, economic, institutional and community stakeholders.

External events, such as the eutrophication of the lakes in the 1960s and the oil crises in the 1970s, aroused the interest of the elected representatives and set the whole process in motion. For local stakeholders, restoring water quality was essential to improve the quality of life in the city and once again make the lakes an attractive place for people. The municipal energy company suggested biomass -a local, abundant source of energy stimulating forestry- as an alternative to oil to avoid exposure to the fluctuations of the oil market. The elected representatives noticed that environmental and energy measures had beneficial impacts on local development. To encourage this trend and assess its potential, the city decided to work with the biggest environmental NGO in Sweden. The NGO implemented measures that created a positive spirit of dialogue between elected representatives and municipal staff, resulting in fruitful discussions between all the economic, political, socio-cultural and community players. In 1996, these discussions led the city council to take the unanimous decision to make Växjö a fossil fuel free city.

This political decision was followed by two periods. In the 1996-2006 period, the city council had no clear plan of action on how to attain its objective. In the same period, the Swedish government launched a local investment fund which proved of pivotal importance to Växjö, as the municipality had to bring together all the local stakeholders to prepare projects and define responsibilities before submitting its application for funding. This work was the starting point of the Local Agenda 21. But in 2006, the municipality realised that attaining its objective would require a coherent, long-term action plan. The second period started in 2007, when the city council set up the local climate commission composed of major public and private stakeholders to work on this action plan. The commission identified priority actions and the players responsible for them. The city council then set up an annual monitoring plan to assess progress and take corrective measures if necessary. In 2010, Växjö officially announced its aim to become “fossil fuel free” by 2030.

By 2012, the city had reduced its CO₂ emissions by 41% compared to 1993. Biomass covers 88% of the district heating supply and the share of oil in the energy mix has dropped from 100 to 6% in 25 years. 58% of the energy supply in Växjö is from renewable sources, i.e. 10 points above national average. Between 1993 and 2010, the economic growth rate rose 73%. The city is an acknowledged pioneer of ecological transition and its “green” profile has attracted between 150 and 200 delegations from all over the world.

PART 1 – THE VÄXJÖ’S ENERGY TRANSITION CHRONICLES

1. THE GREENEST CITY IN EUROPE



Located in Southern Sweden, in a densely wooded region, the municipality of Växjö is peppered with lakes, including in the city centre. The Kronoberg county town is home to 85,000 inhabitants, including 36,000 students at the Linnaeus University, and to 8,000 businesses which benefit from a dynamic and diversified business environment. The main sectors of activity are the service industry, commerce and education. Over 600 companies operate in the field of IT and communications. Växjö is a pleasant, culturally buoyant city which takes pride in its many lakes and green spaces, including in the city centre. Växjö is acknowledged as one the greenest cities in Europe, a reputation that owes a lot to the active involvement of its inhabitants, businesses, NGOs and university.

2. TOWARDS A FOSSIL FUEL FREE CITY

2.1 THE TRIGGER – ACTION AGAINST EUTROPHICATION OF THE LAKES

It all started at the end of the 1960s, when the local community realised that eutrophication and pollution were suffocating the lakes. A eutrophication response plan was developed to solve the crisis and the lakes were restored to a healthy condition. Lakes are part of municipal urban planning as they are considered to be a prime development asset for the city. Inhabitants now come in numbers to the lakes to take a stroll, fish or swim.



The success of this conservation programme, the involvement of the players and the renewed attractiveness of the lakes left a deep impression on the elected representatives who realised that environmental protection could be a major growth driver for the city.

2.2 THE FIRST STEPS – TOWARDS A BIOMASS-BASED ENERGY SUPPLY

The 1980s saw the first steps towards a sustainable energy supply based on biomass. It all started in the 1970s with the oil crises and the resulting increases in fossil energy prices. The municipal energy company, *Växjö Energi Ltd* (VEAB), used oil to supply the district heating network. Anxious to secure its energy supply and offer stable prices to its customers, VEAB decided to reduce its dependence on and vulnerability to oil market fluctuations. Since the city was surrounded by lakes and forests, biomass seemed the obvious choice. The forestry industry could supply VEAB with huge quantities of wood shavings and sawdust it had no use for. Växjö thus became the first Swedish city to use biomass to supply a district heating network. This helped increase the popularity of district heating and the network was gradually extended.

With the support of the municipality, VEAB reached its prime objective, i.e. to reduce its dependence on oil. Using biomass also had a number of additional benefits for the local economy, such as the creation of jobs in the forestry industry and at VEAB, which in turn generated additional tax revenues for the municipality and helped reduce its carbon footprint.

2.3 THE FOUNDATION STONE – FROM AN EXCHANGE OF IDEAS TO A POLITICAL CONSENSUS

Heartened by the success of the lake decontamination programme, the city's elected representatives realised that Växjö had gained a solid reputation for heat and electricity production from biomass with key players such as VEAB, the University of Växjö, already well-known for its research in this field, and newly-established companies in the bioenergy and forestry sector. The municipality decided to launch other projects to encourage emulation, mobilise local stakeholders, accumulate know-how and generate positive impacts on the economy and the environment. Anxious to substantiate its future environmental measures, the municipality approached the biggest environmental NGO in Sweden, the *Swedish Society for Nature Conservation* (SSNC), in 1995. A number of seminars and training sessions were organised as part of this cooperation, which was originally due to last three years, and created a fruitful spirit of dialogue between the SSNC, the elected representatives and the municipal staff. Roundtable discussions were also organised with local NGOs, businesses and citizens to have them take ownership of the debate and start sharing ideas.

Public consultations, discussions and active participation of a number of organisations served as a basis for developing the local Agenda 21¹⁹. Växjö had all the cards in hand and a strong local potential to take action against a global issue: CO₂-induced climate change.

In 1996, following a seminar on the climate in which businesses were invited to express their vision of a fossil fuel free future, the elected representatives unanimously voted for Växjö to become a “*Fossil Fuel Free*” city. The medium-term target was to reduce CO₂ emissions per capita by 50% by 2010 compared to 1993.

2.4 FROM REFLECTION TO ACTION – THE STRATEGY FOR A FOSSIL FUEL FREE CITY

When this decision was taken, the municipality did not know how it would attain its objective nor what measures it should take to become a fossil fuel free city. For Växjö, the solution was found through a coincidence: when the municipality needed to prepare its action plan, the Swedish government announced the creation of a 600-million euro investment fund for environmental protection in 1997. Municipalities were given the possibility to apply for funding through a Local Investment Plan (LIP) which could include a wide range of projects led by the local authority, businesses or NGOs. In Växjö, the LIP proved a useful tool to mobilise local players around theme-specific debates. The municipality and local stakeholders defined what projects would be included in the LIP and what measures would be taken as part of the Local Agenda 21. A number of projects were then implemented in Växjö, with financial support from the Swedish government and the European Commission.

¹⁹ Local Agenda 21: adopted in 1992 at the Rio Earth Summit, it identifies local authorities as key players in promoting sustainable development. The Local Agenda 21 is about integrating all sustainable development dimensions into local projects: balancing the short term with the long term, reconciling economic, social and environmental demands, integrating local and global issues (energy efficiency, greenhouse effect) and environmentally and socially responsible development.

Between 1996 and 2006, the LIP provided a framework bringing together project holders from different sectors with the municipality acting as the main coordinator. Of its ten departments, the Executive Committee and the Technical Department were the most involved in environmental issues. Their knowledge of the territory made it possible to take a direct approach and have personal contacts with individuals and organisations. They were able, for example, to easily identify fuel oil users and have direct discussions with them to define what support the municipality could best provide. On specific themes, they identified which organisations were willing to participate and in a position to provide leverage depending on their corporate objects. The educational sector was more specifically entrusted with working on citizens' behaviour. The Executive Committee was the main coordinator. Each year, as part of its re-application for funding to the Swedish government and the European Commission, the Executive Committee published a call for projects, thus gathering players that would not otherwise meet and encouraging them to come up with innovative projects. Both departments worked in close collaboration with municipal companies, such as the municipal housing company or the municipal energy company, in order to plan and finance actions.

Within the municipality, the fossil fuel free objective is shared by all and each municipal department or company takes action at its own level by adopting environmentally-friendly behaviour or carrying out more specific projects. Växjö believes cross-sectoral measures are necessary and combines measures aimed at changing behaviour, improving energy efficiency and promoting the use of renewable energy in transport or for producing heat and electricity.

The first projects highlighted how hard it was to convince the population to change their habits when this involves a financial effort or changing their lifestyle. The municipality therefore set itself the ambition to make life without fossil fuels easy, for example by providing cheaper, more convenient district heating, more efficient public transport services or more pleasant cycling lanes and pedestrian areas. The idea was not to penalise those who did not contribute to reaching the objective, but rather to encourage those willing to participate. An annual report published by the Executive Committee provided information on the progress and results of the various measures, as well as the reduction in CO₂ emissions.

In 2006, however, the municipality realised that projects were being devised erratically, depending on the context, with no real coherence. The objective to reduce CO₂ emissions per capita by 50% by 2010 compared to 1996 was compromised for lack of strategic guidelines and priorities. The municipality therefore decided to revise its objectives and to set up an Environmental programme to replace the Local Agenda 21 initiative. The target year was then extended to 2025, with a 70% reduction in CO₂ emissions per capita compared to the 1993 baseline. The municipality was well aware that it would not be able to reach this objective alone and neither could it make it mandatory. It therefore decided to call for additional efforts and to gather various experts on a voluntary basis to design a joint action plan. Växjö used the Swedish government and its Climate Commission as a source of inspiration to create its own local partnership commission. Växjö invited all stakeholders, including the municipal administration, the university, the municipal energy company VEAB, the NGO SSNC and transport companies.

Throughout 2007, the local climate commission met on a monthly basis on specific themes such as small-scale power generation, car fuels or cycling. These discussions made it possible to define a baseline and then identify the measures to be taken and the organisations that would be responsible for implementing them. One of the main observations was that citizens were responsible for most CO₂ emissions and should therefore be targeted as a priority. This is why the municipality decided to focus on two areas: urban planning and sustainable transport. By the end of 2007, the commission published a report setting out the

priorities up to 2010. To improve action management efficiency, the executive committee set up an ecoBUDGET²⁰, or environmental budget model, to monitor annual progress. The Commission was to present its results to the city council once a year.

The municipality also became the coordinator of the European project SESAC²¹ (2006-2011) which aimed to accelerate innovation in renewable energy, energy efficiency, CHP and green buildings. Växjö launched demonstration projects for the construction of highly energy efficient housing, biogas production and absorption chilling.

In 2010, the Environmental Programme²² was revised and 2030 was identified as the year when Växjö was to become fossil fuel free. The municipality refocused its efforts away from the city's energy supply to the launch of a plan for the transport sector. This sector has a major environmental impact as transport is responsible for 78% of CO₂ emissions despite the efforts of the municipality to develop cycle lanes and pedestrian areas and to improve public transport. The municipality decided to tackle this issue in close collaboration with local stakeholders, taking charge of the measures it can implement itself and leaving local players do the same on a voluntary basis. This approach bore fruit and many companies switched to biogas and applied energy efficient measures. For example, a taxi company decided to use a geolocation system to improve its performance.

²⁰ ecoBUDGET: www.ecobudget.org/?id=7030

²¹ "Sustainable Energy Systems in Advanced Cities" is a European project integrated into the "Concerto" sub-programme dedicated to energy efficient districts. Växjö is the coordinator of the consortium composed of Grenoble and Delft. Energy Cities is a project partner. www.concerto-sesac.eu

²² Environmental programme: www.vaxjo.se/upload/www.vaxjo.se/Kommunledningsf%C3%B6rvaltningen/Planeringskontoret/Milj%C3%B6dokument%20och%20broschyrer/10%20Environmental%20programme.pdf

3. RESULTS AND IMPACTS OF THE FOSSIL FUEL FREE PROCESS

Over the years, Växjö has evolved from implementing an energy transition to an ecological transition by integrating all aspects of sustainable development and not just its environmental dimension. Eleven areas of action are identified: climate, growth, equal pay between genders, educational level, health, fighting isolation, fighting poverty, employment, waste, water quality and artistic/cultural creativity. The ecological transition initiated some twenty years ago has transformed the city. The results and impacts of the measures have been evaluated (in terms of CO₂ emissions, energy mix composition, renewable energy, “bio-economy”).

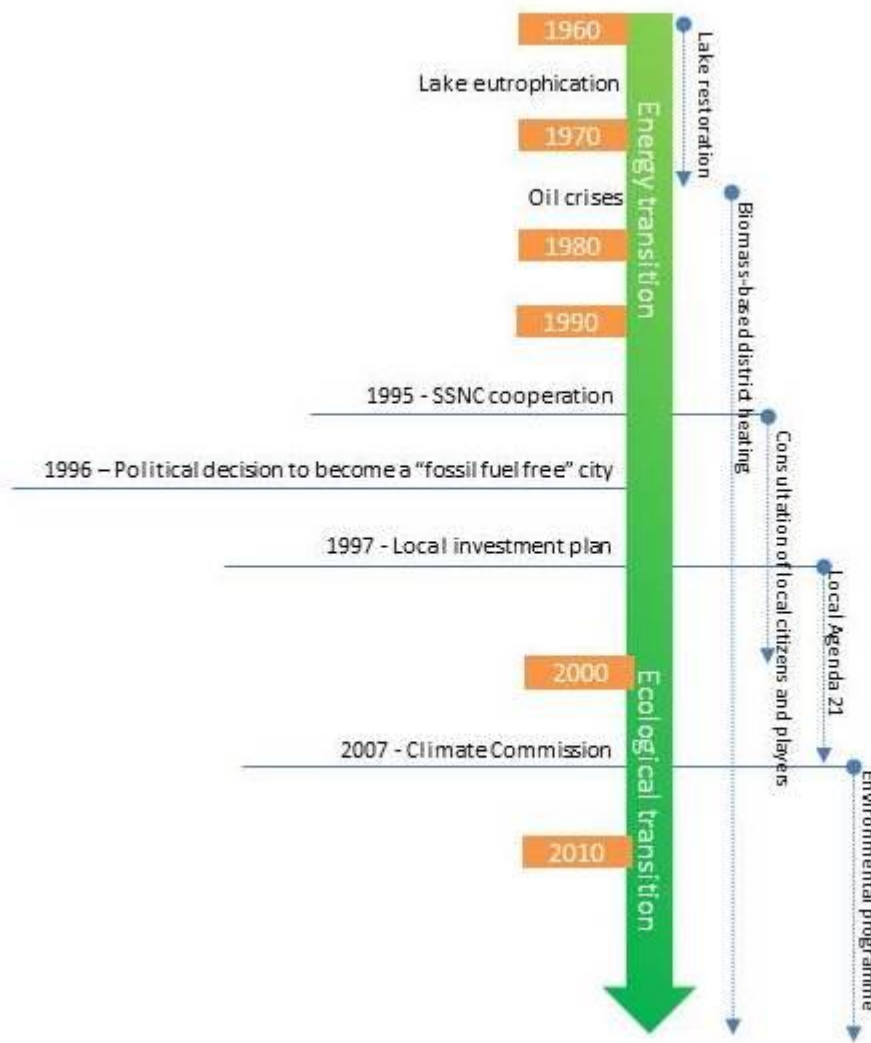


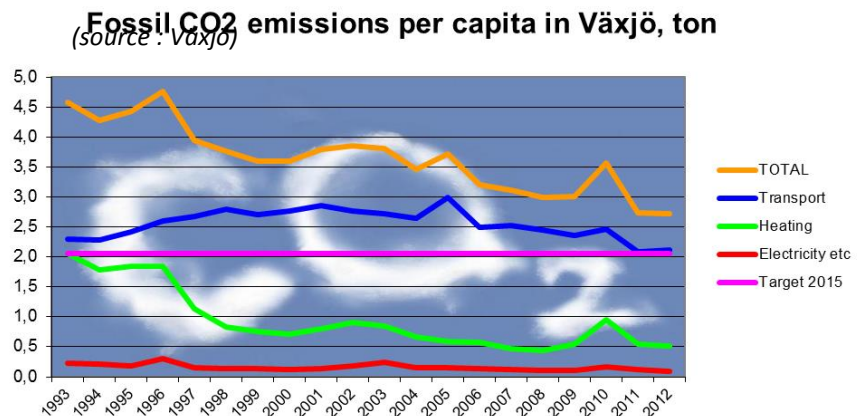
Diagram: Towards a Fossil Fuel Free City

3.1 TURNING A WEAKNESS INTO A STRENGTH

CO₂ EMISSIONS

Växjö's medium term objective was to reduce CO₂ emissions by 55% by 2015. In 2012, the city had already reduced its CO₂ emissions by 41% compared to 1993. In the same year, CO₂ emissions from electricity production, heating and transport amounted to 2.7 tonnes per inhabitant. In 1993, they amounted to 4.6 tonnes per capita, an already low level as a result of the commissioning of the first biomass boiler in the 1980s. By way of comparison, the national average in 2011 was 5.1 tonnes and the EU average (27 members) 7.01 tonnes of CO₂ per capita²³.

Transport is responsible for 78% of CO₂ emissions (of which 39% are produced by cars, 18% by HGVs and 10% by machinery), with industry, commerce and the public sector generating 13% of CO₂ emissions all together and housing accounting for 9%.



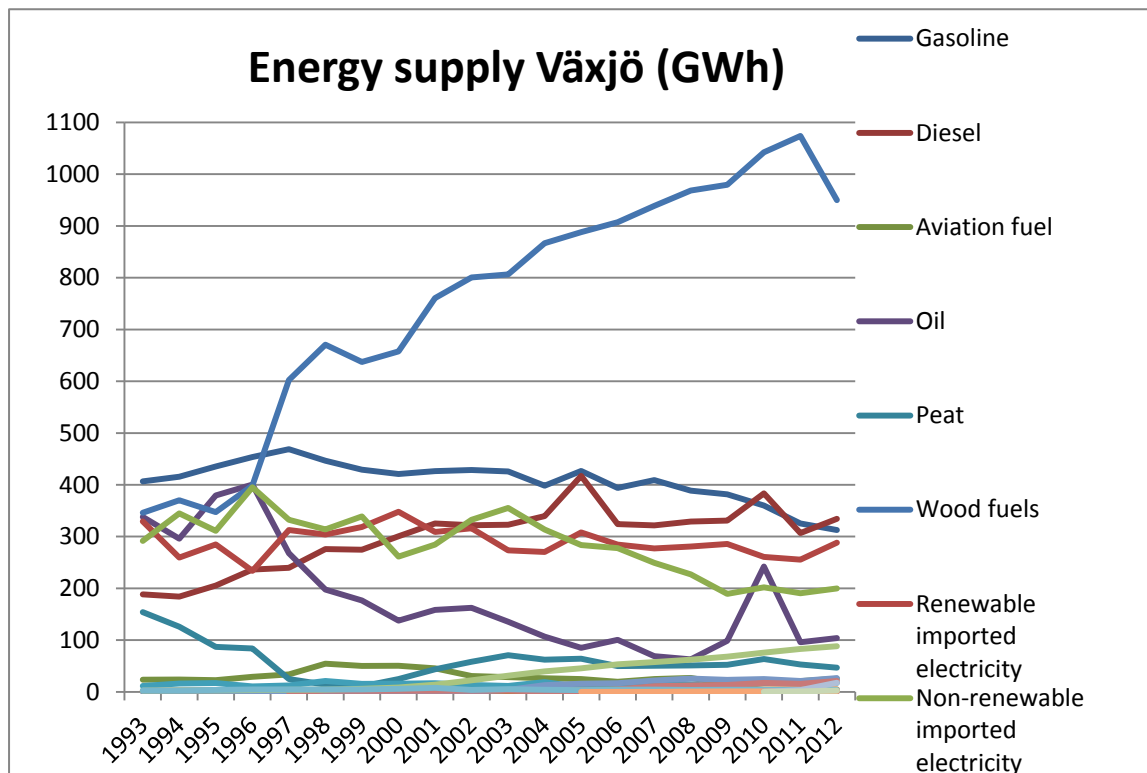
Transport is the sector that registered the slowest progress: in 2012 CO₂ emissions from transport were down only 8% compared to 1993, whereas they had dropped by 75% for heating and by 60% for electricity. As illustrated in the above graph, a peak of CO₂ emissions was observed in 2009 and 2010, due to particularly cold winters during which the district heating system could not fully meet the demand for heating. The use of fossil fuels (here oil) explained this peak in CO₂ emissions.

ENERGY SUPPLY

In 2012, Växjö's total energy supply amounted to 2 448 GWh, with heating accounting for 45%, transport 30% and electricity 25%. Renewable energy represented 58% of the energy mix, but only 8% in the transport sector, against 85% for heating and 70% for electricity. Växjö is Sweden's renewable champion and is 10 points above the national average of 48%.

²³ Source: IEA, CO₂ emissions from fuel combustion highlights, edition 2013

The table below represents the trend in energy supply, with plummeting oil and rocketing biomass.



THE PLACE OF DISTRICT HEATING

Since the beginning of the 1970s, VEAB has been steadily pushing for district heating to replace electrical or fuel oil heating systems. District heating was integrated into the heating network in the centre of Växjö and subsequently into the networks of the housing areas heated by their own boilers. It was then extended to industrial areas and to the rest of the territory.

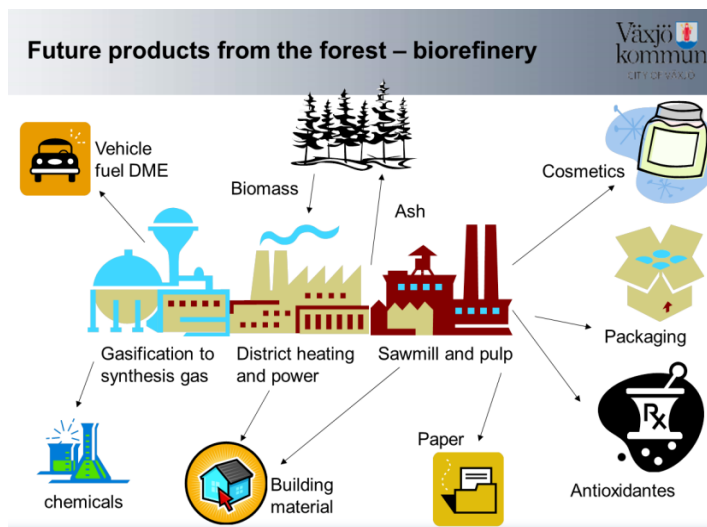
In the last 25 years, the share of oil in the energy mix has dropped from 100% to less than 6%. In 2012, biomass accounted for 88% of the supply, oil 6% and peat 5%. To increase production capacity and meet increasing demand, the station has been gradually extended. It now serves 7,230 customers (i.e. 6,177 houses) and has 365 km of pipework. The station produces 982 GWh of energy, including 781 GWh of heat, 190 GWh of electricity and 10 GWh of district cooling. The electricity produced covers between 25 and 30% of Växjö's annual consumption, the rest being imported. To smooth out variations in energy demand and to avoid using oil, a heat storage tank has been installed. VEAB is the main energy supplier in Kronoberg County and has installed biomass boilers in some neighbouring municipalities. District heating has become extremely popular, especially since the 1990s due to increasing oil prices and the introduction of the Swedish tax²⁴ on CO₂ in 1991. The municipality of Växjö first encouraged connexions to the district heating network, and then made it compulsory for new buildings – the bylaw imposing this connexion has been suspended and is currently being examined by the Swedish government to determine whether this amounts to unfair competition.

²⁴ <http://www.ceps.eu/files/MinistrySweden.pdf>

3.2 THE “BIO-ECONOMY”, A COMPETITIVE EDGE

The progress towards a fossil fuel free city resulted in a 73% economic growth rate between 1993 and 2010. The city boasts a dynamic industry, an airport that meets environmental protection standards as well as large companies such as Volvo, a carbon neutral company which produces articulated dumpers on a 45,000 m² site entirely supplied with renewable energy. Volvo is a good example of how everything is interconnected: waste heat produced by the plant is used in greenhouses for growing tomatoes. The city tries to identify all local potential, exploiting synergies between sectors and infrastructure in its territory. Växjö is permanently reinventing itself with a view to constant optimisation²⁵.

To date, although no study has been conducted to measure the economic impact of Växjö’s energy transition, the direct impacts of the shift to a low-carbon economy are visible at all levels. Forestry has experienced rapid economic expansion, with forestry waste being sold to the CHP unit and for producing biofuels. The value created by harnessing biomass (as illustrated below) also generates activity. In addition to developing the biomass sector, the energy transition process in Växjö contributes to developing other activities, such as consultancy and advice, or operation and maintenance of renewable energy and energy efficiency facilities.



ECONOMIC GROWTH AND CO₂ EMISSIONS (SOURCE : VÄXJÖ)

communication sector and 700 jobs are expected to be created in the next few years. This economic activity has a direct impact on the municipality’s revenues since the main form of direct tax paid in Sweden is local income tax. It is one of the reasons which motivate municipalities to support a buoyant economy.

For Växjö, becoming the greenest city in Europe is not only an environmental challenge, it is also an economic one: it is a competitive edge that contributes to increasing its attractiveness to investors,

²⁵ The list of projects under the Växjö Environmental programme is available from: <http://www.vaxjo.se/Other-languages/Other-languages/Engelska-English1/Sustainable-development/Projects/>

entrepreneurs and talents. A business support and networking strategy has been launched to support local economic expansion. The city today is recognised as a pioneer of the ecological transition towards becoming a fossil fuel free city. Its green profile has already attracted 150 and 200 delegations from all over the world.

3.3 THE TRANSITION TOWARDS A HIGH QUALITY OF LIFE

Växjö has a growing population with a young profile, and gains over 1,000 new inhabitants each year. Half of these newcomers are people of Swedish origin and half are people from the four corners of the world, mainly refugees. By 2030, 30,000 new inhabitants are expected to join the local population. Anticipating on population growth forecasts, the municipality is considering a vast sustainable housing programme.

The social impacts of energy transition are visible in the progress made in terms of quality of life, whether in the housing sector, local infrastructure or access to green spaces. The ecological transition has made it possible to build eco-buildings that use 35 to 40% less energy than buildings meeting national standards, to improve public transport, cycling facilities and pedestrian areas as well as accessibility to green areas and lakes, now at a walking distance for most citizens. According to the Swedish Statistics Institute, 46% of households in Växjö do not have a car.

Social cohesion has been reinforced, there is more interaction between politicians and the local population *via* the many discussions organised in the neighbourhoods. Networking is also essential with a strong fabric of private, public and community players. The prime objective is to engage citizens on the issue of sustainability and energy transition. However, Bo Frank notices a weaker commitment than at the beginning of the transition process. According to him, this is due to the fact that ecology is now on the agenda of all Swedish political parties, thus conveying the impression that the political sphere has fully taken charge of the issue.

PART 2 – ANALYTICAL INPUTS

1 GOVERNANCE MODEL

The governance model applicable to Växjö's energy transition gradually came into being, adapting to the needs and constraints of each period. The city owes its motto of "Växjö, the Greenest City of Europe" to the strong involvement of all local players and to a coherent, long-term strategy.

1.1 THE SWEDISH MODEL

Understanding the governance model of Växjö requires first understanding the Swedish model. As Pierre Forthomme explained at a seminar organised by the *Association des Amis de l'École de Paris du management* in 2007, Swedish society is a horizontal society, sociologically under protestant influence. Sweden does not operate on a vertical, hierarchical model. The principal of empowerment and the notion of horizontality are strong values. The now widespread use of the second-person pronoun "du" also tends to erase the hierarchical distance imposed by the more formal, third-person form of address, now reserved to the royal family for ceremonial reasons. The notion of community is highly developed, as is concern for others and for the common good. A strong feeling of individual responsibility to the group and dedication to work contribute to creating strong communities. Land is viewed as a common good and each individual is entitled to use the natural environment freely, regardless of public or private ownership rights, provided the use is reasonable and restrained. The "magic triangle" – economic performance, social cohesion and respect of the environment – has established a connection between these traditional values and policy-making. In other terms, for Swedes, economic performance objectives are directly related to social progress and sustainable development.

Sweden is a constitutional monarchy with a parliamentary system. The 1901 Local Authority Act significantly reduced the State's powers. The 1975 Constitution guaranteed autonomy to two local authority levels, the counties and the municipalities. Municipalities have a wide range of responsibilities, including primary and secondary education, social welfare, urban planning, water distribution and sanitation, environmental protection, waste collection, parks and open areas. The municipality can levy taxes to exercise its responsibilities.

1.2 THE VÄXJÖ MODEL

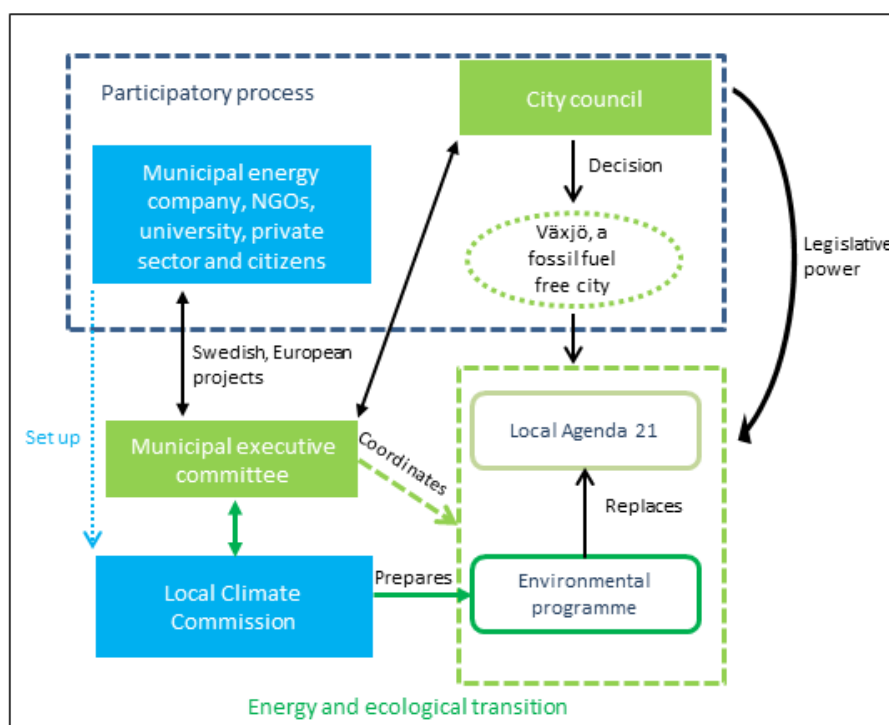
In the 1990s, the energy company VEAB played a decisive role by starting the energy and then ecological transition process. Made vulnerable by the oil crisis, VEAB went in search of more secure supply solutions at more stable prices. Later in 1995, the municipality of Växjö took advantage of the success of its lake conservation programme and the production of heat and electricity from biomass to sign a contract with the largest environmental NGO in Sweden, SSNC, to evaluate the potential of environmental measures. SSNC acted as a catalyst in the dialogue between elected representatives and municipal staff and organised fruitful exchanges between economic, political, socio-cultural and community players. This strong involvement of local players led to the unanimous decision to make Växjö a fossil fuel free city in 1996. The Swedish government then contributed to the process with its investment fund for environmental protection. The calls for projects issued by the Government contributed positively to bringing businesses, NGOs and the municipality together as project holders. This was the first step

towards the preparation of a Local Agenda 21. Overall, the 1996-2006 period was marked by a host of measures led by different players as part of the “Fossil Fuel Free Värmland” programme defined in 1999. Within the municipality, the two key departments were the technical department and the municipal executive committee. In 2006, following a CO₂ emission evaluation survey, the municipality realised that a coherent action plan was needed to achieve the objectives set for 2010. A local climate commission was set up in 2007 for a period of one year to accelerate transition. Its aim was to unite and have the following key players work together:

- Elected representatives,
- Members of the municipal executive committee, as coordinators of the initiative,
- Academics – for their research skills,
- The municipal energy company - for its infrastructure and the efforts made
- The environmental agency SSNC – for its expertise in energy efficiency, transport and renewable energy, and
- Representatives from the private transport sector – notably a taxi company and a road haulage contractor.

The local climate commission met on a monthly basis to set out the strategic directions and priorities and to define the type of actions to be undertaken as well as the players responsible for implementing them. The municipality’s executive committee is also involved in monitoring activities and preparing an annual progress report for submission to the city council.

The municipality, the private sector and the university are working together towards achieving the zero fossil fuel objective. The measures implemented are financed through subsidies from the Swedish government, the European Union and the municipality. This close relationship between players is based on shared ideas, experiences and expertise. Värmland’s involvement in networks of Swedish and international cities, such as Klimatkommunerna, Energy Cities, the Union of the Baltic Cities or ICLEI, is an example of this.



As for the private sector, Sweden aims to promote the competitiveness of its businesses through responsible commercial practices. The mobilisation of businesses can therefore be explained by their desire to present a flawless social and environmental profile, but also by the profit they expect to derive from them. As regards the university, it has developed an internationally recognised centre of excellence on biomass. As the main driver of this ecological transition, the municipality has been able to take advantage of a remarkable local predisposition to develop and implement collective strategies.

2 ACTION DRIVERS

The action drivers that enabled Växjö to go down an ecological transition path are commented below.

2.1 LOCAL AUTHORITY POWERS

Sweden is one of the world's most decentralised countries and local authorities are directly responsible for a wide range of areas, including environmental protection and energy supply. They can set standards and decide on financial incentives. They have used this comfortable leeway to encourage more environmentally-friendly mobility in city centres and to lay down building standards that are more stringent than European or national ones. Local authorities can also levy taxes to finance their responsibilities. Local income taxes are directly paid to municipalities and represent their main source of revenue (67% of total municipal budgets). Municipalities are therefore extremely keen to maintain a buoyant local economy and a low unemployment rate. In Växjö, the ecological transition has promoted local economic development, attracted new businesses and created jobs, a source of tax revenues for the municipality.

2.2 COOPERATION WITH ALL THE SECTORS

The intensive dialogue promoted through roundtable discussions, training sessions and working groups brings together political and economic representatives, academics, NGOs and local citizens. It has helped develop action plans and identify the organisations responsible for implementing them. In addition to this dense fabric of local players, exchanging ideas and experience with other cities through national and international networks has also contributed to attaining the objective.

2.3 POLITICAL CONSENSUS AND CONTINUITY

All the political parties officially committed themselves to the fossil fuel free city objective in 1996. The main strategic directions have always been taken unanimously. This political consensus is important to guarantee the continuity of environmental protection. Nothing has disturbed the implementation of the long-term strategy and vision, not even the change of the political majority following municipal elections.

2.4 FINANCING

Växjö has obtained funding from the Swedish government and the European Union for a number of measures. The city enjoys a high level of credibility due to its strong political commitment and wide support from its local players, which have also helped with funding. The city has also gained credibility for its capacity to present practical, quantifiable results.

2.5 PLANNING, EVALUATION AND ADAPTATION

Since 2007, the municipal executive committee has produced an annual report on the objectives set by the Environmental Programme that is validated by the municipal council. The report ensures transparency in the programme's progress and implementation, assesses the measures taken and recommends their adaptation if necessary. The city council has also adopted an environmental model budget based on the principle that ecology and economy are part of the same concept: resources management. This "green" budget aims at managing natural resources in the same way as financial resources. The budget is used by all municipal departments and companies and includes 16 environmental indicators used for managing and monitoring the Environmental Programme.

2.6 A CYCLIC APPROACH TO SUSTAINABLE DEVELOPMENT

In order to use its resources better, Växjö has developed a cyclic approach to sustainable development based on the concept of the circular economy, i.e. material recycling and flow optimisation. Many activities are interconnected. For example, natural and household waste is used to heat homes and fuel the city's buses which run on local biogas made from food and sewage waste. The development of biofuels is a good example of a circular economy, as it creates jobs and provides the agricultural sector with new outlets. Another example is the transformation of forestry waste by the CHP unit or the recovery of residual heat from the Volvo company to heat agricultural greenhouses.

PART 3 – RESOURCES

1 RESOURCE PERSONS

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BRUSSELS-CAPITAL (BELGIUM), AN URBAN LABORATORY OF ENERGY EFFICIENT BUILDINGS





The region

Brussels-Capital Region
Belgium
1.15 million inhabitants



Local key players

Evelyne Huytebroeck,
Brussels-Capital Minister of
the Environment, Energy and
Urban Renovation from 2009
to 2014



Grégoire Clerfayt, Head of
the Energy Department at
Bruxelles Environnement
from 2011 to 2014

Key figures

800,000 m² is the total surface area of passive buildings in the Brussels-Capital region (vs. zero in 2007)

23% is the reduction in CO₂ emissions per capita compared to 1990

1,800 businesses are involved in the “sustainable construction” activity of the Job-Environment Alliance

4,300 jobs are expected to be created by 2020 as part of the “sustainable construction” activity

Milestones

2002 The Belgian government adopts the 2nd federal plan for sustainable development - Brussels-Capital launches its Air-Climate Plan

2004 Brussels-Capital has a new government – The building sector is identified as a priority – Involvement of stakeholders and financial incentives (energy bonuses)

2005 Launch of the “Energy Challenge” for households

2006 Launch of the PLAGE project supporting property asset managers in implementing energy management systems – Study tour to Freiburg (Germany) on the theme of passive buildings

2007 Call for “Exemplary Building” projects: construction of the first passive buildings – Transposition of the European Directive on the Energy Performance of Buildings into local law

2008 Creation of the 0% “Green Loan”

2009 The passive standard is made mandatory for new public buildings

2011 Decision to impose the passive standard on all buildings by 2015

2012 Signature of the “Bruxelles Passif 2015” agreement - Brussels-Capital is the 1st local authority to impose a passive standard in the world

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KEY POINTS TO REMEMBER

In only ten years, the Brussels-Capital Region has become one of the frontrunners of sustainable construction in Europe. Thanks to an ambitious energy policy initiated in 2004, the Region has progressed from 0 m² of passive buildings in 2007 to over 800,000 m² in 2014. Energy use per capita has dropped by 25% and greenhouse gas emissions by 16% since 2004. As a signatory to the Convention of Mayors, the Region has set itself ambitious objectives and is committed to reducing its greenhouse gas emissions by 30% by 2025 compared to 1990.

Thanks to the experience acquired in the last decade, the Region has developed a genuine energy culture which culminated with the adoption of a passive building standard for all new buildings, public and private alike, in 2015. This new standard is the result of a joint effort by the Region and the construction industry.

In 2004, the election of a new government, more sensitive to regional energy issues, resulted in the adoption of an energy policy. A voluntary energy and environmental strategy enabled Brussels-Capital to reach a high number of professionals and private individuals, with promising first results. The Region did not, however, ignore the social dimension and the necessary protection of consumers in general and of the most vulnerable/deprived sections of the population in particular. As the main contributor to greenhouse gas emissions, the building sector became the priority target of the Region's energy transition process. Building performance improvement was set to follow three phases: awareness, incentive and demonstration (phase 1), support and large-scale implementation (phase 2) and massive investment (phase 3).

The last phase is intended to broaden the scope of energy transition from existing buildings to the whole city so as to achieve a truly sustainable city culture.

PART 1 – THE BRUSSELS-CAPITAL’S ENERGY TRANSITION CHRONICLES

1 BRUSSELS-CAPITAL, AN ATTRACTIVE AND COSMOPOLITAN REGION

Brussels-Capital is one of the three regions that make up Belgium. Attractive and cosmopolitan, the Region was created in 1989 and comprises 19 municipalities. It benefits from stable economic growth and has many titles: capital of Flanders, capital of the French Community, capital of Belgium and capital of the EU. With 1.15 million inhabitants in 2013, Brussels-Capital concentrates around 10% of the Belgian



population in an area of 161 km². With 692,442 jobs in 2011, it is the most important employment area in the country. Brussels-Capital’s GDP accounts for 19% of national GDP whereas it covers just 0.5% of national territory. Economic activities include European, federal and international administrative functions as well as financing and business services.

Its “multi-capital” status is, however, also a source of inconvenience. Only a limited number of the jobs created go to local people. Of the 3 regions, Brussels-Capital has the highest rate of unemployment, which affects 20% of the labour force, against 8.8% nationally. People under 25 and with low qualifications are the most affected. Brussels-Capital is also experiencing a phenomenon common to many conurbations, with well-to-do citizens moving to suburban areas, considered to be more pleasant. Over 50% of employees commute to the city centre every day, mostly by car, thus contributing to transferring the wealth produced in Brussels to the other two regions and thus, paradoxically, increasing poverty. The asymmetry between the amount of wealth produced and available resources generates strong disparities in terms of income, training opportunities and access to housing. This “social polarisation” has led to a territorial fracture. In some neighbourhoods, the population is getting poorer and access to housing is becoming more difficult. Most buildings are old and energy-inefficient, therefore absorbing a significant share of the residents’ income.

From a demographical point of view, Brussels-Capital is at a record high. Its population increased by 15% between 1990 and 2012 and continues to grow steadily. The population is getting younger and the birth rate is rising. According to ISBA²⁶ forecasts, Brussels-Capital is set to pass the 1.27 million inhabitant mark by 2020.

2 A JOB-ENVIRONMENT ALLIANCE FOR A SUSTAINABLE CITY

2.1 EARLY STAGES – LIFE-SIZE EXPERIMENTS

In 2004, the election of the Brussels-Capital government marked the beginning of the energy transition. Before 2004, energy policy was not considered a priority. In the 1990s, the Brussels’ public authorities contemplated integrating sustainability into regional planning. In 1998, Brussels-Capital became a

²⁶ ISBA : Institut Bruxellois de Statistique et d’Analyse –Brussels Institute for Statistics and Analysis

member of Energy Cities²⁷, the European association of local authorities in energy transition. At the same time, the European Union took measures to promote sustainable energy and energy efficiency, notably via the 2002 European Directive on the Energy Performance of Buildings (EPBD)²⁸ that the Member States were to transpose into national law. In the early 2000s, the Belgian government adopted the 2nd Federal Sustainable Development Plan (2004-2008). At that time, Brussels-Capital was more concerned with air quality issues and adopted an Air-Climate Plan in 2002²⁹.

Energy made its first appearance on Brussels' political agenda in 2004 when the newly elected Brussels-Capital government created a Ministry of Energy, Environment and Urban planning which was assigned to Evelyne Huytebroeck, a member of the Green Party. The political decision to promote energy efficiency was motivated by true awareness of climate change issues and increasing energy prices. The Ministry rapidly identified buildings as the priority area as they offered the highest energy saving potential at regional level. The situation was indeed alarming: Brussels-Capital was listed as one of the heaviest energy users and main CO₂ emission contributors in Europe. A household survey carried out in 2001 showed that 78% of the 475,000 housing units in Brussels were built before 1970, i.e. before the first oil crisis³⁰, at a time when energy was not a major issue. Residential and office space buildings accounted for 74% of Brussels-Capital's end energy use, with the residential sector alone representing 41%. Buildings were responsible for 70% of CO₂ emissions in the region. The region was also experiencing a housing shortage of several million units at a time when the population was rapidly increasing.

Finally, it has to be said – and all local authorities would agree on this – that energy users failed to see the importance of energy efficiency. Technical information was too complicated for those interested in taking action, professionals could not keep up with demand, energy efficiency investments were not given priority in resource allocation plans and renewable energy-based technologies were underused due to poor economic viability³¹.

2.2 INVOLVING LOCAL STAKEHOLDERS TO MAKE GREATER PROGRESS

In 2004, the Ministry decided to take action and, with the assistance of IBGE³² (Institut Bruxellois pour la Gestion de l'Environnement – Brussels Environmental Management Institute), also known as Bruxelles Environnement, developed an energy policy which included an awareness and incentive focus, a social dimension and phased-in regulations. Under this legislature, a number of services³³ to energy users were put into place, first dedicated to public authorities and private businesses, and then widened to households.

“Facilitators” henceforth provided citizens with free advice on how to reduce energy use, first for the service industry, and then for private individuals. Energy experts were trained to support professionals, institutions and businesses in technical aspects relating to energy and eco-design. An incentive policy was also developed by Brussels-Capital to encourage private individuals to improve housing energy efficiency (insulation, heating appliances, white goods, renewable energy systems) through a series of bonuses. These so-called “energy bonuses” aim to cover all or part of the additional cost of retrofitting a building to high energy efficiency standards. The bonuses have been a major success and have resulted in significant

²⁷ Energy Cities: <http://energy-cities.eu/>

²⁸ 2002/91/EC Directive: http://europa.eu/legislation_summaries/other/l27042_fr.htm

²⁹ Air-Climate Plan 2002-2010: http://www.belgium.be/fr/publications/publ_leefmilieu-brussel-lucht-en-klimaatplan-2002-2010.jsp

³⁰ “Vers une Région bruxelloise sobre en carbone à l'horizon 2025” – March 2010

³¹ IEE PassREg, “The success model of Brussels” (page 6)

³² IBGE: <http://www.bruxellesenvironnement.be/>

³³ http://evelyne.huytebroeck.be/IMG/pdf_BILAN_NRJ_2009.pdf

improvements for a reasonable investment. The fund used to finance these bonuses was gradually increased from 1.2 million euros in 2004 to 14 million euros in 2009.

In 2005, the *Défi Énergie*³⁴ or ‘Energy Challenge’ initiative was launched. The objective was to work with households on how to improve consumer behaviour, a crucial measure considering that 59% of occupants are tenants who have no leverage on the building structure itself³⁵. Households were then encouraged to reduce their energy bills by adopting a number of simple, energy-saving measures, both at home and when travelling. The operation demonstrated that up to 20% of energy use depends on consumer behaviour.

In 2006, Bruxelles Environnement launched PLAGE³⁶ (*Plan Local d’Action pour la Gestion Énergétique*), a local energy management action plan aimed at helping public property managers (schools, hospitals, swimming pools, etc.) install an energy management system at a reduced cost through a 4-year support programme. After 4 years, heating energy savings amounted to 18% on average, whereas electricity use was stabilised.

2.3 TOWARDS EXEMPLARY BUILDINGS FOR ALL

Also in 2006, two events accelerated the energy transition process. A delegation from Brussels discovered passive buildings, a concept that at that time seemed unfeasible and very far from Brussels’ reality, on the occasion of a study tour organised by Energy Cities to Freiburg, Germany. The delegation was composed of private and public decision-makers, local political leaders, architects, town planners, property developers and social housing managers. They discovered an emblematic city in the field of sustainable construction and discussed with property developers and owners’ associations large building retrofitting and renovation projects, project profitability and specific day-to-day management issues. When asked about the lessons learned during this study tour to Freiburg, the Brussels delegation was unanimous: passive buildings were a feasible option at a reasonable cost. Grégoire Clerfayt³⁷, Director of the Brussels-Capital’s “Energy, Air, Climate, Sustainable Construction and Economy” Unit, then met with a representative of the Franche-Comté Regional Council (France) at an IMAGINE³⁸ seminar, who explained to him the principles of the call for sustainable construction projects. Grégoire Clerfayt found the concept of encouraging innovation and the development of high energy and environmental efficiency buildings highly attractive. The idea was to make building owners and the construction industry aware of “low energy” and passive building techniques so as to change construction and retrofitting practices. The Minister, Evelyne Huytebroeck, also appreciated the idea of promoting the passive standard on the basis of a competitive tendering process.

The call for “Exemplary Building” projects was launched in 2007 with four requirements: (1) the projects should meet the passive building standard (new buildings) or the low/very low energy standard (retrofitting); (2) they should promote eco-design; (3) be of high architectural quality; and (4) be simple and easily reproducible from both a technical and financial point of view.

The “Exemplary buildings” competition was designed to provide financial incentives to building owners, whilst reinforcing and stimulating the expertise of architects. Citizens, building owners, architects, engineers, consultancies and businesses were challenged to produce projects based on criteria that were

³⁴ Défis Énergie: http://www.bruxellesenvironnement.be/Templates/defi-energie-menages/defi_energie.aspx?langtype=2060

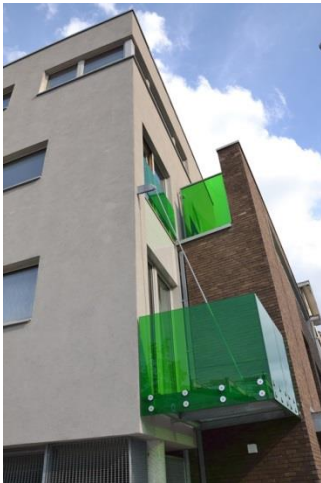
³⁵ “Vers une Région bruxelloise sobre en carbone à l’horizon 2025” – March 2010 (page 13)

³⁶ PLAGE : <http://www.bruxellesenvironnement.be/Templates/Professionnels/Informer.aspx?id=32601>

³⁷ Grégoire Clerfayt joined the Ministry of Energy, Environment and Urban Renovation in 2004 and became Head of the Energy Department at Bruxelles Environnement (IBGE) in 2011

³⁸ IMAGINE is an initiative by Energy Cities which helps towns and cities by providing them with a foresight platform of collaboration and exchange leading to action and change: <http://www.energy-cities.eu/imagine>

so far unheard of in Brussels-Capital, leading to the first passive buildings to be constructed in the Region. These were extremely varied: residential buildings, including privately-owned and council housing, houses and blocks of flats, office space buildings, schools, rest homes and hospitals. The calls for projects met with unexpected success and attracted many, high quality proposals. The Region decided to repeat these calls for projects every year and increased the resources of the fund. These Exemplary Buildings opened up new avenues for the experimentation of passive buildings in Brussels-Capital, which progressed from 0 m² in 2007 to over 80,000 m² of passive buildings already constructed or in the process of being built in 2009. This further confirmed the idea that the passive standard³⁹ was feasible and could be implemented at no significant additional cost for the construction – or even renovation in some cases - of residential, school or office space buildings.



In June 2007, the government transposed the European Directive on the Energy Performance of Buildings (EPB) into Brussels law. The local ordinance on EPB was the most ambitious in Belgium and aimed at reducing energy use by at least 30% in all newly constructed or renovated buildings, including social housing. This legislation was an important driver in bringing about a real transformation in built property.

Brussels-Capital's energy strategy stands out by its social dimension in a delicate context. Energy expenses weigh heavily on households' budgets and the cost of fossil energy keeps increasing. In Brussels, one inhabitant in four lives below the poverty line and the gap between the richest and the poorest is increasing⁴⁰. Social and energy issues have become inseparable.

The Region therefore laid down the principle that any regulation aimed at improving energy efficiency must benefit those who struggle the most to pay their energy bills.

The local government is also aware that reducing its own energy bill creates budget margins that can be used to help those in dire need and that the energy policy is a social policy in that it creates jobs in an unemployment-stricken region.

In 2008, the renovation bonus system was revised to make it more accessible to the most deprived Brussels households. The 2006 ordinance transposing the European directive on the opening-up of the gas and electricity markets into local law integrated consumer protection clauses and the "Energy Challenge" was gradually opened to the most vulnerable sections of the population, social workers being trained in the rational use of energy. Then in 2008, Bruxelles Environnement and the alternative credit cooperative CREDAL developed a new service, called "**Green Loan**", for low income households to benefit from a 0% interest loan to finance energy efficiency work in their homes.

The energy policy that was put in place in 2004 therefore contributed to developing an energy culture reinforced by the local government's voluntary approach and focusing on consumers' awareness and incentives. This favourable context stimulated energy efficiency demand, guaranteed the support of experts, made financial aid available and set an example in the field of sustainable construction. The life-size experiments (PLAGE, Exemplary Buildings, energy bonuses) were conducted with professionals from all sectors who tried out new concepts, developed expertise and created a technical benchmark. The government supported this process by adopting an appropriate legislative framework. The results were

³⁹ The passive standard reduces heating requirements to 15 kWh/m²/year, against 150 for conventional buildings, thus making conventional heating systems unnecessary. This performance is made possible by high insulation and air-tightness levels, coupled with a heat-exchanger ventilation system for comfort.

⁴⁰ "Politique énergétique de la Région Brussels-Capitale – Bilan 2004-2009", p. 21

measured and showed that reducing energy use was possible: energy consumption dropped by 10% and CO₂ emissions by 12% between 2004 and 2007. Equally significant is the number of jobs created in the construction industry, which represented over 25,000 jobs in 2009. Retrofitting bonuses alone generated additional turnover of 100,000 million euros and resulted in the creation of 1,000 to 1,500 jobs⁴¹. The Region also noticed the beneficial impact of sustainable energy measures on local development. Energy transition was identified as an economic revival driver and the Region initiated a reflexion on this subject.

2.4 CONSOLIDATION YEARS – CAPITALISING ON EXPERIENCE

Brussels-Capital gradually became a full member of the club of sustainable energy pioneers. Whereas not so long ago the local government used to send representatives to other countries to learn from more advanced cities, in 2009 it hosted the annual conference of the Energy Cities network⁴². The new government decided to ensure the continuity of its energy policy through a strong political declaration: “Sustainable regional development at the service of Brussels inhabitants - *Un Développement Régional Durable au Service des Bruxellois*”⁴³. Minister Evelyne Huytebroeck was re-elected for a second term. The knowledge and expertise acquired under the previous legislature made up a solid base for reinforcing, structuring and improving the energy strategy. In February 2009, Brussels-Capital seized the opportunity of the launch of the Covenant of Mayors⁴⁴ at the European parliament to join the initiative, thus reaffirming its commitment on the European scene with a 20% CO₂ emission reduction objective by 2020.

In the second phase of its energy transition, the creed of the Brussels-Capital government was to capitalise on experience. Ever more stringent regulations were adopted based on the EPB directive requirements. Convinced of the exemplary role of the public sector, in July 2009, the government decided that the passive standard should be made mandatory for all new public buildings and that retrofitting of public buildings should meet the low-energy standard. The legislation became effective in 2010. All public organisations depending on the Region - administration, para-regional organisations and social housing - had to be exemplary in the measures adopted and in their practices. This legislation also proved a strong economic growth driver, the public sector being a major economic player and public procurements representing 15% of Belgium’s GDP⁴⁵. Brussels-Capital generates 20% of this GDP and concentrates a high number of local, regional, community, federal, European and international public institutions. Public procurements can therefore help prepare the market to more stringent future requirements in the field of sustainable construction.

In 2011, the government went even further and decided to extend the passive standard to all new buildings, public and private alike, by 2015. The building trade went along with this decision but warned about the difficulty for some players to meet the criteria. Before reaching this decision, the Region organised a consultation with the construction industry stakeholders in 2009. These multilateral discussions led to the “Brussels passive 2015”⁴⁶ agreement. The initial objectives were maintained but greater attention was given to the specificities of the construction market and to builders’ freedom of action. The signing of the agreement in 2012 was the climax of Brussels-Capital’s “sustainable building”

⁴¹ “Politique énergétique de la Région Bruxelles-Capitale – Bilan 2004-2009”, p.27

⁴² www.energy-cities.eu

⁴³ Declaration of political interest of 16th July 2009: <http://www.bruxelles.irisnet.be/files-fr/a-propos-de-la-region/competences-regionales/accord-de-gouvernement-2009-2014-rbc>

⁴⁴ Covenant of Mayors: <http://www.conventiondesmaires.eu/>

⁴⁵ GDP: Gross Domestic Product

⁴⁶ “Passif 2015” technical addenda: http://evelyne.huytebroeck.be/IMG/pdf/131004_passif_2015_annexe_FINALE.pdf

policy. It was the first time that such a standard was adopted by a local authority worldwide, the European Union expecting to make it mandatory only by 2021⁴⁷.

As a general rule, this decision was well received by the construction industry. The first experimentations started in 2005, meaning that the building sector could rely on ten years of experience by 2015. Some opposed the decision, but the life-size experimentations were conclusive and spoke in favour of the government. After stimulating demand, Brussels-Capital had a duty to support supply by reinforcing the construction sector.

2.5 THE CREATION OF THE JOB-ENVIRONMENT ALLIANCE

This period of consultation led to the creation of the Job-Environment Alliance (*Alliance Environnement-Emploi-AEE*) in 2010⁴⁸ with sustainable construction as its first priority. The Alliance aims to prepare a socioeconomic plan to help building firms grow, thus meeting one of the government's priorities, which is to boost the local economy as part of the Contract for Economy and Employment (C2E). The Region is suffering from deindustrialisation⁴⁹ and is plagued with high employment, especially among young people and people with low qualifications. Sustainable development represents a huge potential for jobs and business development.

The Job-Environment Alliance is a multisectoral partnership bringing together social partners, the Brussels-Capital construction confederation, trade federations, socioprofessional integration players, as well as public stakeholders involved in environmental, employment and training issues. The Alliance targets building firms, workers, job seekers (especially those with low skills), schools offering construction curricula and training centres. The Alliance offers a unique collaboration opportunity to players who are not used to meeting one another and even less working together. It is based on a two-phase participative approach⁵⁰. During the first, “*bottom-up*”⁵¹ phase, the stakeholders take part in discussion workshops to identify the obstacles, difficulties and deficiencies that hamper the sector's transition towards more sustainable construction practices and propose an action plan. In the second, “*top-down*” phase, a monitoring committee analyses their input, taking institutional constraints and public priorities into account, and defines the scope and priorities of the actions. Monitoring is carried out by operational people, called “*action pilots*” using a series of indicators and results assessed periodically to measure progress. After three years, 130 public and private organisations have been involved and 64 actions defined. The Alliance has a 5.5 million euro budget to implement the measures⁵².



The local support services for citizens such as the “*Maisons de l'Énergie*” (energy centres) have been revamped. A Reference Centre⁵³ has been added to the range of services aimed at developing the ecobuilding and renewable energy sectors by improving training for unskilled workers. The Centre also carries out studies on new professions in the building trade to guide and prioritise training requirements.

⁴⁷ http://evelyne.huytebroeck.be/IMG/pdf/131004_passif_2015_discours_FINAL.pdf

⁴⁸ Officially signed in 2011

⁴⁹ <http://charlespicque.info/web/wp-content/uploads/2011/12/dossier-de-presse-d%C3%A9f.pdf> (page 5)

⁵⁰ 2010 -2014 multiannual report: http://www.aee-rbc.be/wp-content/uploads/2014/03/140313_AEE_Chapeau_preview_entier.pdf

⁵¹ http://fr.wikipedia.org/wiki/Approches_ascendante_et_descendante

⁵² 2011 JEA report: http://www.logementdurable.eu/wp-content/uploads/20110714_bilan_AEE_FINAL.pdf

⁵³ Reference centre: <http://www.bruxellesformation.be/bruxelles-formation-ses-partenaires/partenaires/les-centres-de-references.html>

In June 2012, Brussels-Capital received a prize at the “Sustainable Energy Europe Awards”⁵⁴ ceremony organised by the European Commission. This distinction acknowledged the Region as one of the leading European local authorities in the field of sustainable development. As the European Commission pointed out, *“The efforts of the Brussels-Capital Region prove that things can change when public authorities set the example and implement ambitious policies”*.

More recently, in May 2013, the Region adopted an Air, Climate and Energy Management Code⁵⁵ (COBRACE). This code is part of the government’s ambitious vision (2009 government agreement⁵⁶) and includes air, climate and energy policies, which are all linked as they involve the same sectors and players: the construction industry and the transport sector, public authorities, businesses and citizens. COBRACE merged all these policies, adapted several environmental and energy regulations and placed the green transition within a strict, legal framework.

Building a sustainable future for cities is a challenge. Brussels-Capital has chosen to develop several measures in a number of areas impacting life in the city, like improving energy efficiency in buildings. A sustainable city is also built by implementing cross-sectoral policies in neighbourhoods: in addition to building retrofitting programmes, the Region has also developed “sustainable district contracts”⁵⁷ to create a new local dynamic in terms of housing, public space and community equipment. For Brussels-Capital, being a sustainable city means supporting the hundreds of community initiatives being developed in its territory. The Region’s ambition is to develop a true sustainable city culture in which respect for the environment contributes to human and social development.

3 IMPACTS AND RESULTS

Just 10 years ago, Brussels-Capital suffered from a reputation of being an energy sieve, but the government worked hard to reverse the trend. Various life-size experiments were conducted to test and demonstrate the capacity of local players to improve energy performance. Since 2009, capitalising on its experience, the Region has drastically changed its energy culture.

The result is a success story. End energy use per capita dropped by 13% between 1990 and 2012, i.e. a 400 million-euro saving for the whole region per year since 2004. CO₂ emissions per capita decreased by 23% compared to 1990⁵⁸. In the building sector, end energy use per capita fell 10% and CO₂ emissions 26% compared to 1990.

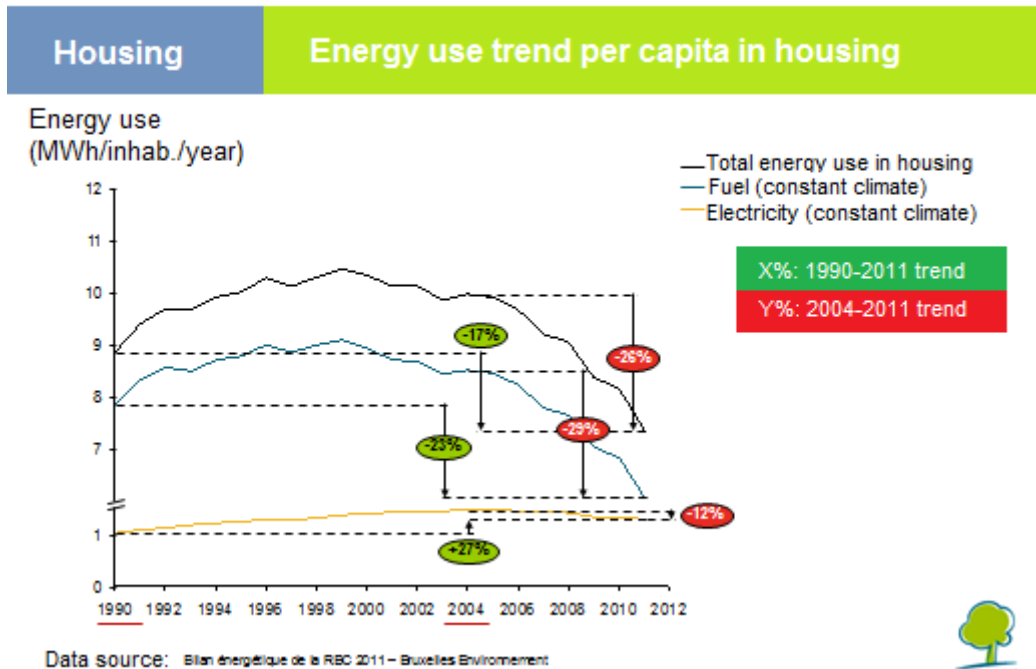
⁵⁴ EUSEW http://www.eusew.eu/component/see_projectview/?view=see_projectdetail&index=1&tagId=-1&countryID=-1&catId=5&pageNum=0&projectId=7491

⁵⁵ COBRACE explanatory document: <http://urbanisme.irisnet.be/actualites-accueil/pdf/cobrace-document-explicatif>

⁵⁶ See page 29 of the 2009-2014 governmental agreement: <http://www.bruxelles.irisnet.be/files-fr/a-propos-de-la-region/competences-regionales/accord-de-gouvernement-2009-2014-rbc>

⁵⁷ Sustainable District Contracts: <http://www.quartiers.irisnet.be/fr/accueil>

⁵⁸ Speech by Evelyn Huytebroeck “Bilan 2004-2014: une nouvelle culture de l’énergie”



Between 2007 and 2014, 33 million euros of subsidies were granted to 243 projects (1,866 housing units: 952 passive and 914 low energy units corresponding to 354,142m² of passive and 267,361m² of low energy buildings) as part of the calls for “Exemplary Building” projects.

The “Energy Challenge” has attracted 6,772 participants since 2006. Between 2004 and 2013, 160,000 energy bonuses were granted, totalling 113 million euros.

Between 2011 and 2013, 184,000 hours of training were delivered as part of the Sustainable Construction activity of the Job-Environment Alliance: 26 schools took part, i.e. almost all the schools in Brussels, and around 1,800 businesses were involved in the transition towards Sustainable Construction. Job creations resulting from rolling out current measures and policies (2020 horizon) are estimated at 4,300⁵⁹ for the “Sustainable Construction” activity alone (10,100 for all the Alliance activities).

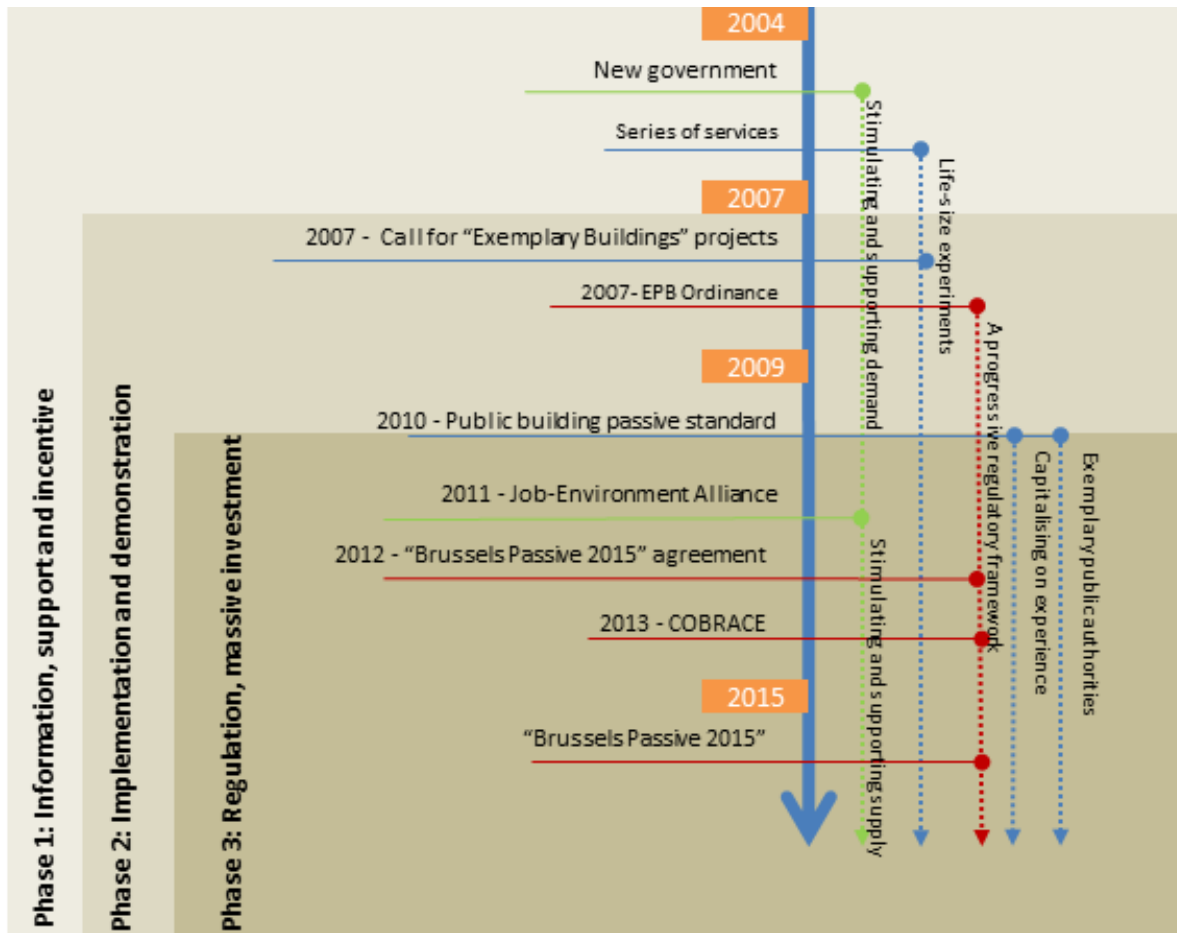
The share of the regional budget dedicated to energy policy increased from 3.6 million euros in 2004 to 60 million euros in 2014, with the government earmarking 30 million euros for its Sustainable Development department. This comes on top of the tax on gas and electricity use which generates an additional 30 million euros. The energy department of IBGE, which employed 4 people in 2004, had 117 employees in 2014.⁶⁰

The energy policy has helped develop a true energy culture. Brussels-Capital knows that building construction/renovation and architecture play an important role but are not the only drivers leading to a sustainable city. Citizens are taking an increasingly active part through dozens of initiatives carried out by groups of citizens or community organisations and which contribute to transforming the city. The development of this “energy culture” can be seen in the strong increase in traffic on the IBGE website, which registers around 50,000 hits per month, or the number of visitors to the *Fête de l'Environnement* (Environment Festival), around 20,000 each year.

⁵⁹ <http://www.aee-rbc.be/uncategorized/le-rapport-pluriannuel-2010-2014-de-lalliance-emploi-environnement-en-ligne/>

⁶⁰ 2014 activity report : http://documentation.bruxellesenvironnement.be/documents/RAP_20140521_Jaarverslag_FR.pdf?langtype=2060

A number of prizes have acknowledged the Region's progress, such as the *Sustainable Energy Award* in 2012 or the 3rd ranking in the Green European Cities index⁶¹, just behind Copenhagen and Stockholm, in 2013. Brussels-Capital is one of the leading World and European metropolitan areas in the field of sustainable urban management.



The Brussels-Capital's energy transition process over time

⁶¹ <https://www.swe.siemens.com/belux/web/fr/presse/presse/cc/Pages/green-city-index-update.aspx>

PART 2 – ANALYTICAL INPUTS

1 THE BRUSSELS' ENERGY TRANSITION GOVERNANCE MODEL

This part addresses the governance model and identifies the players, their roles and interactions in the Brussels-Capital's energy transition process.

The energy transition process is orchestrated by the Brussels-Capital government through the Ministry of Energy, Environment and Urban Renovation and by IBGE. Like the other Belgian regions, Brussels-Capital has full powers in the fields falling within its jurisdiction as a Region, which include the environment, energy policies and employment, and in the fields of jurisdiction it transferred from the City of Brussels and the former province. The Region also cooperates with the Federal State regarding initiatives that are linked to its status as Capital of Belgium and seat of the European institutions. The Region has its own parliament and government and exercises its legislative power through enforceable ordinances. Another specific feature is the Region's two official languages as the people of Brussels belong either to the French or Flemish community. Regional MPs are elected for five years and are divided into two lists: French-speaking and Dutch-speaking. The political parties are elected by proportional representation and the governments must then form coalitions. In a nutshell, to be able to govern, a compromise with various partners (from different communities and political parties) must be reached.

The mission of IBGE is twofold: on the one hand it carries out research, plans and advises the Ministry and on the other hand, it stimulates, supervises and ensures the implementation of the political strategy.

In 2004, the Ministry and IBGE knew what they wanted to achieve: use less energy and reduce CO₂ emissions. The building sector was rapidly identified as the main target as it was responsible for over 70% of end energy use and CO₂ emissions. Neither the industry, which is quite limited in the region, nor mobility, which was identified as a regional planning issue rather than an energy one, were then considered to be priorities.

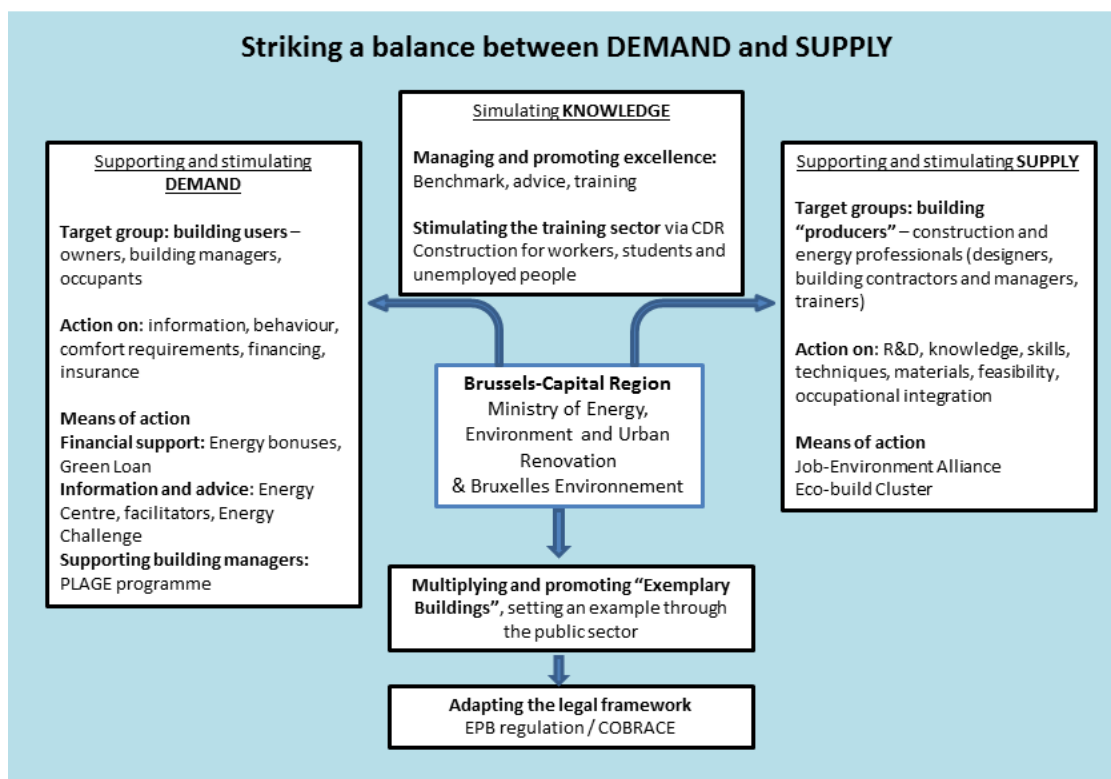
Once the target identified, there remained a simple question: how to introduce the necessary changes from scratch? Two possibilities: either the Region launched large projects alone, at a high cost, or it encouraged local players to take initiatives and supported project holders and managers engaged in eco-construction. Brussels-Capital chose the second option, the participative method, which consists of stimulating demand, supporting pilot and innovative projects, and picking up enthusiastic initiatives by citizens, businesses and public authorities. The idea is to start with local people's needs and rely on their skills, before letting other players join the momentum. To encourage businesses and citizens to participate, the Region chose to focus on energy, a stimulating lever with a financial saving potential.

As a first step, the Region created a number of support services for volunteer citizens and businesses who wanted to innovate and to live and work differently: consuming less whilst making the most of city life. The Region decided to work on two aspects: first "hardware", i.e. the buildings, technical facilities and materials, and second "software", i.e. information, training for professionals, changing uses and behavioural patterns, maintenance and equipment. This involved producing benchmarks and creating trade networks and associations.

What helped accelerate the energy transition momentum were not big conferences or wide-ranging negotiations, but life-size experiments (PLAGE, BATEX, Energy challenges...) which served as benchmarks. They created a suitable framework for innovation and excellence: professionals could test out new concepts, develop expertise and produce a set of technical guidelines for sustainable construction. In a nutshell, these experiments helped:

- Involve a large number of construction professionals and develop a true “energy culture”;
- Demonstrate that the passive standard was feasible at no major extra cost for both new buildings and renovation work;
- Identify a lever for reviving the local economy and stimulating job creations;
- Lay down a gradual, yet ambitious regulatory framework by making the passive standard compulsory for all new buildings by 2015.

This host of best practices and their “snowballing” effect drastically changed the Region in an even more visible way. Institutional players followed suit. The *Société de Logement de la Région de Bruxelles-Capitale*⁶² (SLRB) in charge of social housing made sustainable development a priority of its 2010-2014 strategic plan. Its exemplary energy management made it possible to reduce tenants’ maintenance charges and had very positive social and economic impacts. New housing units will now have to display the lowest occupancy cost⁶³ for the future occupier. The *Société de Développement pour la Région de Bruxelles-Capitale*⁶⁴ (SDRB) is also active in the field of economic expansion and urban renovation. In order to make the region more attractive to citizens, housing units for low income people have been created under public-private partnerships in neighbourhoods lacking residential buildings. SDRB has become a pioneer in sustainable construction and has been entrusted with building and marketing the first passive block of flats.



⁶² SLRB <http://www.slrbririsnet.be/>

⁶³ The occupancy cost is made up of the rent (or mortgage loan reimbursement) plus utility charges.

⁶⁴ SDRB : <http://www.sdrb.be>

The incentive and demonstration phase made it possible to accumulate significant results over several years. Brussels-Capital used this experience to build a real vision for the future (“Bruxelles Passif 2015”) and gave itself the resources to make it happen. A new phase then started so as to consolidate and expand building energy efficiency on a wider scale. Demand had to be stimulated and the professional supply needed restructuring. The Region became a role model for energy management in its own public buildings with passive building and low energy retrofitting standards. Simultaneously, the Region used the Job-Environment Alliance to develop a local supply of local businesses capable of meeting its new energy ambition. This Alliance was the result of synergies between the energy policy and the 2009 governmental agreement on the revival of the local economy. The new building and retrofitting sector represents a huge potential in terms of job creation and economic development and may well be an answer to the high unemployment rate experienced by the Region⁶⁵ especially among the under 25 and unskilled people. The Alliance is the result of this analysis carried out jointly by the Ministry of Energy and the Ministry of Economy.

2 ACTION DRIVERS

This part identifies the action drivers that have contributed to accelerating or reinforcing the energy transition in the Brussels-Capital Region.

2.1 REGIONAL JURISDICTION

Like the other Belgian regions, Brussels-Capital has its own jurisdiction that is similar to that of a state⁶⁶ – especially in the field of regional planning, the environment, economy, transport, energy policy and the organisation of local powers⁶⁷. It has the capacity to pass laws and can therefore have its energy policy enforced in accordance with its strategy. It also has the power to transpose European directives.

2.2 A PROGRESSIVE, AMBITIOUS REGULATORY FRAMEWORK

The EPB (Energy Performance of Buildings) regulation of Brussels-Capital is one of the most ambitious in Europe. It was adopted in 2008 for new buildings and heavy retrofitting work and was reinforced by the adoption of the passive standard for all new public buildings in 2011 and private buildings by 2015. The adoption and then reinforcement of these regulations encountered very little opposition as the Region enacted them progressively, building on years of experience in sustainable construction.

2.3 THE CHOICE OF A PARTICIPATIVE APPROACH

To engage its energy transition, Brussels-Capital turned to its citizens, professionals and institutions. It encouraged community initiatives and projects led by committed project managers and designers. Stakeholders were gradually involved, first by creating a momentum with volunteers, then by setting an example through the public sector and creating trade networks and associations. The Region supported and financed external organisations, like the consumers’ federation or trade associations (heating

⁶⁵ Of the three regions that make up Belgium, Brussels-Capital has the highest rate of unemployment, which affects 20% of its labour force, against 8.8% nationally.

⁶⁶ The regional government: <http://www.bruxelles.irisnet.be/a-propos-de-la-region/le-gouvernement-regional>

⁶⁷ The government’s jurisdiction: <http://www.bruxelles.irisnet.be/a-propos-de-la-region/les-competences-regionales>

engineers, architects, construction, etc.). These federations have become partners and ambassadors of the regional energy policy.

2.4 SYNERGIES TO BOOST THE LOCAL ECONOMY

One of the conclusions from the 2004-2009 legislature under Evelyne Huytebroeck is that the construction and renovation sector has a significant economic development and job creation potential. This potential can be used to create synergies between public and private players around common objectives. The Job-Environment Alliance initiated by the Ministry of Energy and the Ministry of Economy proved to be an efficient tool.

2.5 BRUSSELS, AN URBAN LABORATORY

In 2004, the Region knew what to do but did not have the resources to implement it. The series of life-size experiments, with the call for “Exemplary Building” projects as the flagship action, helped stimulate and encourage innovation. Project managers, architects, engineers, consultancies and businesses took up the challenge of presenting projects meeting totally new criteria in Brussels. The first results were very promising: many high quality projects showed that Brussels had plenty of resources. The experience thus acquired through these years made it possible to produce a set of technical guidelines and to confirm that the passive standard is perfectly feasible without any significant extra cost for new and renovation work.

2.6 STUDY TOURS

Study tours are an opportunity to get together a very varied group of people: public and private decision-makers, political leaders from the Region and the municipalities, architects, town planners, property developers and social housing managers. Study tours also help bring Brussels’ stakeholders together, initiate debate, discover others’ practices and experiences (like passive buildings in Freiburg in 2006) and discuss with counterparts from other countries. The lessons learned from these study tours have been instrumental in fighting preconceived ideas and confirming the desire to take action locally.

PART 3 – RESOURCES

1 RESOURCE PERSONS

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Renovation at the Brussels-Capital Region from
July 2009 to July 2014
Official website: <http://evelyne.huytebroeck.be>

2 DOCUMENTARY RESOURCES

Job-Environment Alliance (Alliance Emploi-environnement), official website: <http://www.aee-rbc.be/>

be.passif 2015, *Bruxelles passif en 2015*, <http://www.bepassive.be/viewer/02/fr/>

IBSA Institut Bruxellois de la Statistique et de l'Analyse, official website,
http://www.ibsa.irisnet.be/?set_language=fr

Institut Bruxellois de la Statistique et de l'Analyse, *Mini Bru 2014 – La Région Brussels-Capitale en chiffres*, <http://www.ibsa.irisnet.be/fichiers/publications/minibru/mini-bru-2014-fr.pdf>

Institut Bruxellois de la Statistique et de l'Analyse, *Baromètre démographique 2013 de la Région de Brussels-Capitale*, <http://www.ibsa.irisnet.be/fichiers/publications/focus-de-libs/FOCUS-3-FR-final.pdf>

IBGE Institut Bruxellois pour la Gestion de l'Environnement, official website,
<http://www.bruxellesenvironnement.be>

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http://documentation.bruxellesenvironnement.be/documents/BxlVilleDurable_FR.PDF

Institut Bruxellois pour la Gestion de l'Environnement, *Vers une région bruxelloise sobre en carbone à l'horizon 2025*,
http://documentation.bruxellesenvironnement.be/documents/RBC_carbone_2025_PacteMaires_SEAP_FR.PDF?langtype=2060

PassREG, *Brussels Success Model*, http://www.passreg.eu/index.php?page_id=289

Photo credits: City of Brussels

BURGENLAND (AUSTRIA): ENERGY TRANSITION TO REVIVE THE LOCAL ECONOMY



The region



Burgenland State
Austria

287000 inhabitants

Symbol



The construction of the biggest wind farm in Austria was recently launched in Burgenland

photos © IG Windkraft

Key figures

39% is the share of renewable energy in Burgenland's energy use in 2011

829.6 MW, is the region's wind power capacity, the second highest in Austria

4,500 jobs have been created through the development of wind power in Burgenland

Milestones

1992 A citizen from the north of the state wants to install a wind turbine on his property and contacts a consultancy – The consultancy recommends building a large farm in view of the site's high wind power potential

1993 The owner and the consultancy present the project to the Zurndorf town council

1993-1995 Planning and wind measurements

1994 Creation of a company for managing the project (the municipality has a 98% stake)

1995 Failure of the feed-in tariff negotiations with the grid manager – Austria joins the European Union: Burgenland benefits from the Structural Funds

1997 The Austrian government aims to increase the share of renewable energy to 3% of final energy use – Beginning of construction work at the Zurndorf wind farm

2001 Opening up of the Austrian electricity market

2002 Burgenland develops a regional wind power plan

2003 Adoption of the Green Power Act

2009 Creation of *Energieteam* which sets an energy self-sufficiency target by 2050

2013 Burgenland is self-sufficient in electricity

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KEY POINTS TO REMEMBER

The Austrian State of Burgenland has set itself an ambitious target: to become self-sufficient in energy by 2050. This objective is the result of a process that has been formed slowly. Burgenland seemed an unlikely candidate for such a turnaround as it was lagging far behind the rest of Europe in terms of economic development. Austria then became a member of the European Union and Burgenland started benefiting from the Structural Funds as an Objective 1 region (development gap).

Local players were the first to invest in wind power and biomass as the renewable energy sector showed growth potential, resulting in new operators entering the market. The rapid growth of renewable energy pushed the State into launching a strategy so as to define its energy transition priorities. This strategy was driven by community initiatives in a co-building spirit. Local players had needs and visions but they were also a source of proposals.

The municipality of Zurndorf was instrumental in revealing the economic profitability of wind energy. The municipality presented a wind farm project to the State authorities and started to negotiate a feed-in tariff with BEWAG, the regional energy supplier. But the wind farm only took shape in 1997 when it was made a pilot project following the declaration of the Federal government in favour of the development of renewable energy sources. Operating results exceeded all expectations, wind power potential in the northern part of the State turning out to be 30% greater than the original estimates. BEWAG then developed its wind power activity and other operators followed suit. At the same time, the town of Güssing, a pioneer in biomass use, focused its efforts on this energy source.

In 2002, the State launched a regional plan to identify the areas that were the most favourable to wind power development with all the stakeholders. This approach proved the right one as a decision reached by consensus guarantees sustainable solutions and safe planning for investors. The 2003 Federal Green Power Act and the feed-in tariff regulations accelerated the momentum. With energy becoming a major issue, the Region entrusted the regional energy agency, which received financial and human resources to prepare an energy concept in 2008. The agency was also in charge of supervising *Energieteam*, a group composed of representatives from the public and private energy sectors and responsible for defining the regional energy strategy priorities with a cross-sectoral approach.

In 2011, renewable energy sources accounted for 39% of Burgenland's end energy use. In 2013, the region celebrated self-sufficiency in electricity, local production exceeding local needs. Wind power has also created jobs, companies setting up business in this new wind-power land. Burgenland rapidly caught up on its economic shortfall and experienced the highest economic and employment growth in Austria, as well as a massive increase in its rate of exports. The region has become an energy transition model in Europe.

PART 1 – BURGENLAND'S ENERGY TRANSITION CHRONICLES

1 BURGENLAND, A “LAND OF VILLAGES”

Located in Eastern Austria, Burgenland borders Slovakia, Hungary and Slovenia. With 3,965 km², it is one of three smallest Austrian States (*Länder*) and the least populated with 286,691 inhabitants⁶⁸, i.e. around 3% of the Austrian population. The region developed along a north-south axis (160 km) as a consequence of the reorganisation of the border at the end of the Austro-Hungarian Empire and the subsequent loss of economic activities.



In 1921, Burgenland was separated from Hungary and became the 9th *Land* of Austria. The former economic centres, such as Sopron (60,000 inhabitants) or Szombathely (80,000 inhabitants) remained Hungarian. Burgenland is mainly composed of small towns and villages (171 municipalities). Eisenstadt, the *Land* capital is the largest city (14,790 inhabitants in 2012). The State is also called the “land of villages” (*Das Land der Dörfer*),⁶⁹ in reference to its rural character.

The geopolitical situation of Burgenland changed when the neighbouring states joined the European Union in 2004. Austria joined the CENTROPE cross-border region⁷⁰ (whose centres are Vienna, Bratislava, the Hungarian city of Győr and the Czech city of Brno) - the “Region of the future” (*EU-Zukunftsregion*) composed of regions from five countries: Austria, Italy, Slovenia, Croatia and Hungary- thus plugging into the geographical and economic heart of a vaster Europe. For decades, Burgenland suffered from rural migration due to its position at the country's margins and poor accessibility. The new geopolitical conditions contributed to developing transport infrastructure and Burgenland regained a strategic position with regard to the cities of Vienna and Bratislava and to the Vienna-Budapest transport corridor. The population started to grow again at the end of the 1980s, registering a 5.5% increase between 1991 and 2003 thanks to net immigration, but a growth rate still below Austrian average⁷¹.

In 1995, with the *Land* lagging behind in its development, it became eligible to join the Objective 1 programme⁷² of the EU regional policy aimed at reducing economic and social disparities between regions. In 2007, after an accelerated catch-up phase, Burgenland entered into a financial aid phasing-out⁷³ period which ended in 2013. Burgenland is now one of the regions experiencing the fastest economic growth. A good example of this is the development of technological centres in partnership with small and medium-sized enterprises which reinforced its dynamism as an economic hub. The fastest growing economic sectors are renewable energy, electronics, ICTs, tourism and agriculture. Burgenland has proved remarkably resilient to crises thanks to its SMEs and to the investments made in the region. The tertiary sector is now dominant whereas the primary sector is losing ground. The unemployment rate is at 4.6%, against 4.8% in Austria and 10.7% in Europe.

Burgenland is a frontrunner in the field of energy generation from renewable sources. The State has ambitious objectives. In 2013, it achieved self-sufficiency in electricity supply and now aims to have 50% of its energy use covered by renewable sources by 2020, and 100% by 2050.

⁶⁸ 2013 situation - <http://www.burgenland.at/land-politik-verwaltung/land/statistik-burgenland/menschen-und-gesellschaft/bevoelkerung/>

⁶⁹ “Burgenland: Vom Grenzland im Osten zum Tor in den Westen”, Roland Widder, 2000

⁷⁰ <http://www.centrope.com>

⁷¹ Source: <http://www.statistik.at>

⁷² Objective 1: <http://www.phasing-out.at/de/ziel1/programme>

⁷³ “Alles über Phasing out”: <http://www.phasing-out.at/de/phasing-out>

2 RENEWABLE ENERGY, A GROWTH DRIVER FOR THE LOCAL ECONOMY

2.1 A PIONEER SPIRIT OR DELUSIONS OF GRANDEUR?

In the 1970s, wind-generated electricity started to attract increasing international interest. Austria carried out advanced research on the technological development of facilities. But the drop in fossil energy prices, technical difficulties and lack of clear energy policy objectives put an end to this research activity. Before the early 1990s, wind power was mainly used to supply energy to off-grid locations⁷⁴.

Burgenland is a border region, which long remained isolated from the Eastern states by the “iron curtain”. When Austria joined the European Union in 1995, the situation changed. The inclusion of Burgenland in Objective 1 of the European Structural Funds boosted this rural region which was struggling to develop its economy. The European funds contributed to instilling a new lease of life to the area. Energy was back on the agenda and the first 500 kW wind turbines got off the ground.



In the northern part of the *Land*, a private individual was planning to have a small wind turbine installed on his property. In 1992, he contacted *Energiewerkstatt*, a consultancy specialising in wind power, which strongly advised him to upgrade his project to a wind farm. According to them, the project should be much more ambitious in view of the huge wind potential⁷⁵ of the north of the region, a guarantee of high energy efficiency and increased financial return. For this individual, only Rudolf Suchy, mayor of Zurndorf (2,000 inhabitants) would be able to see this project through successfully. It was during the 1993 Environment Days that he and *Energiewerkstatt* presented the idea of a wind farm to the mayor and municipal councillors.

The project was judged convincing. It was in line with the municipal policy and fitted into the local development concept called *Dorferneuerung*⁷⁶ that the mayor had been implementing since 1987. The municipality of Zurndorf was seeking to develop environmentally-friendly agriculture as well as environmental and social infrastructures. At the regional level, Zurndorf wanted to be perceived as an innovative municipality in the field of sustainable development with a high quality of life. In this context, the council saw in the wind farm a solution to supply the municipality with electricity. The financial gain derived from the wind farm would also constitute an additional and sustainable source of income for the municipal budget. In short, it was both an environmental reflection and an economic logic that prompted the council to accept the wind farm project. During the discussions between Zurndorf and *Energiewerkstatt*, the latter succeeded in convincing the municipality to sell the electricity to the regional supplier on the ground that producing electricity for the municipality only in a closed circuit would have been too risky a technical challenge.

Planning started with wind measurements that were conducted between 1993 and 1995. The first results were excellent compared to other European sites. In 1994, *Energiewerkstatt* was officially commissioned to plan the wind farm. In a very short space of time, decisions were made regarding the type of equipment, farm location and size: 10 50kW wind turbines with a total capacity of 5 megawatts (MW). This project, considered to be highly ambitious at the time, seemed justified by the cost-benefit calculations. Annual output was estimated at 9 million kWh, i.e. 1% of electricity demand in Burgenland, whereas the total investment was assessed at 6 million euros. Since the municipality was unable to bear such a cost alone, it thus became dependent on financial aid (green funds of the Ministry of the Environment and Objective 1 of the European Structural Funds).

⁷⁴ For heating, hot water production and battery recharging. Installed capacity amounted to 200 kW.

⁷⁵ Pokorny's studies showed that the Parndorf plateau had a significant wind power potential

⁷⁶ Dorferneuerung: http://www.zukunftburgenland.at/front_content.php?idcat=306

Public meetings were organised during the planning phase to keep citizens and stakeholders up to date. Contrary to what the municipality feared, the project was well received by the population, although conservationists expressed more concerns. The wind farm site was located near a nesting area of a protected bird species. Hunters put up little resistance, despite the proximity of a hunting ground, considering that a wind farm would have no significant impact on wild animal behaviour. Consideration of the interests of conservationist groups at an early stage meant that their requirements could be met. As a result, the site location was moved to the edge of the municipality.

Anxious to improve management of the project, the council created the *Energieprojekt Zurndorf GmbH*⁷⁷ (EPZ) company in 1994, a modern, more appropriate and more responsive structure. EPZ also made it possible to transfer the costs (mainly for wind measurements) from the municipality to the company. The mayor of Zurndorf, Rudolf Suchy, became the manager of *Energieprojekt Zurndorf GmbH*, with the municipality as the main shareholder with a 98% stake. An advisory committee was created to ensure the municipality's democratic participation, composed of elected representatives from all the political groups on the council and local economic experts.

2.2 THE DIFFICULT BIRTH OF THE WIND FARM

Once the wind farm planning phase was completed and approved by the council, the central issue was then to clarify the economic conditions at the regional level: profitable operation of the farm required financial support and the adoption of a feed-in tariff for wind-generated electricity. In 1995, EPZ started negotiating with several players:

- the Austrian bank *Kommunalkredit*⁷⁸ in charge of managing the green fund on behalf of the Austrian Ministry of the Environment,
- WiBAG⁷⁹ the organisation responsible for supervising the use of the European funds as part of Objective 1,
- BEWAG⁸⁰ in charge of managing the regional power grid and negotiating feed-in tariff for wind-generated power.

As the project did not meet the criteria of the Austrian government's subsidy programme for wind power -total farm capacity exceeded the 1 MW limit- feed-in tariffs became central to the negotiations between BEWAG, the Burgenland government and EPZ. The Mayor of Zurndorf, Rudolf Suchy, started to lobby Karl Stix, the President of the Land and majority owner of BEWAG, the organisation responsible for negotiating the feed-in tariffs. BEWAG adopted a firm stance against feed-in tariff increases despite pressure from the government to alleviate operating expenses that otherwise would too burdensome for the supplier and contrary to the law on joint-stock companies. Besides, BEWAG did not want to set a precedent that would open the door to feed-in tariff renegotiations with other green electricity suppliers.

Overall, the project's prospects looked promising. On the one hand, the project was added to the region's priority list for financial support under Objective 1 and on the other hand, the *Kommunalkredit* bank agreed to subsidise the project equal to 30% of its total cost. But the negotiations came to a standstill when the government announced its intention to reconsider feed-in tariffs for renewable energy. BEWAG warned that it would use all possible means to obstruct the negotiations. Discouraged, the government backtracked and withdrew its bill. Despite its status as BEWAG's majority shareholder, the government faced strong lobbying from private corporations.

The situation changed when BEWAG's management was restructured, with the new CEO showing stronger commitment to renewable energy. Meanwhile, EPZ tried to find alternative financing solutions, such as private investments. The attempt failed for lack of a feed-in tariff for electricity. The accumulation

⁷⁷ GmbH: Limited liability company – Ltd.

⁷⁸ Kommunalkredit Austria: <http://www.kommunalkredit.com>

⁷⁹ WiBAG: <http://www.wibag.at>

⁸⁰ BEWAG became Energie Burgenland in 2012: <http://www.energieburgenland.at>

of costs (c.a. 73,000 euros for wind measurements and *Energiewerkstatt* operating expenses) and the approaching expiry date of the financial agreement with *Kommunalkredit* put added pressure on the Mayor of Zurndorf. The negotiations resumed in this delicate context but this time, they aroused the interest of the local and national media, which widely covered what they called “the fight of David against Goliath”. The negotiation process was given a significant boost in 1997 when the Federal government announced its intention to increase the share of renewable energy to 3% of national energy use, thus confirming the position of the Burgenland government and rekindling its enthusiasm. The Burgenland government decided to turn the wind farm into a pilot project which would be financed entirely through subsidies, without increasing the feed-in tariff. WiBAG, the company responsible for managing the European funds in the region, was entrusted with identifying the most profitable subsidy model under Objective 1. It appeared that the best solution would be to have an operating company such as EPZ, owned by one or several SMEs holding at least 75% of the shares⁸¹, as project leader. In order to meet these criteria, WiBAG committed itself to finding an SME willing to join the project, in addition to BEWAG which had already expressed its interest. There were no more obstacles to the construction of the wind farm when the *Infratech GmbH* SME⁸² offered to become the majority shareholder of the operating company. As for the municipality of Zurndorf, it stated that it was prepared to sell EPZ, since the conditions for a successful project were not met at the municipal level, and also because an expert report commissioned by BEWAG estimated that the wind power potential had been overestimated by 30%.

Work started in July 1997. A number of negotiations were conducted simultaneously with WiBAG, BEWAG and the Land government, in which Zurndorf no longer took part. The discussions concerned what level of feed-in tariffs would improve the viability of the project. The President of the Land, Karl Stix, finally pushed through an additional act that increased the feed-in tariff for wind power. All the difficulties and uncertainties were then lifted, as well as all obstacles to the negotiations with Zurndorf.

An acquisition offer for the wind farm was finally presented to the municipality of Zurndorf following an agreement between regional stakeholders. The offer included the acquisition of EPZ, responsibility for all costs incurred and the payment of a €2,200 annual occupation rent for the siting of each wind turbine. In August 1997, the acquisition offer was approved by all stakeholders and EPZ had a new owner: BEWAG thus became both an investor and a developer and *Infratech* became the project leader.

The final project, 65% subsidised due to its “pilot” nature, included 6 wind turbines with a total capacity of 3 MW, enough to supply electricity to 1,500 average-size households. New concerns raised by conservationists led BEWAG to commission regular studies on a protected bird species living in the vicinity of the farm⁸³. The farm was inaugurated in 1998 and at the end of the same year, operating results surpassed expectations, with its 7.5 kWh production causing a significant upsurge in European wind power generation statistics.

2.3 CONTINUED RENEWABLE ENERGY DEVELOPMENT AT REGIONAL LEVEL

At the regional level, the size of the project was revised, taking a cautious approach, and economic viability was guaranteed despite a 30% lower capacity than originally planned. The farm proved highly profitable. Reassured by these initial results, BEWAG started building a second farm in Zurndorf, which also received financial support. Less than 2 years later, the company decided to concentrate on wind power and even included it in its own long-term development strategy.

Subsequent wind power projects no longer benefited from European funds. Indeed, the financial risk turned out to be non-existent in view of the high profitability guaranteed by the region’s high wind power profile. The Zurndorf pilot project was held up as an example of projects made possible thanks to the

⁸¹ SME: small and medium-sized enterprise

⁸² Burgenland had shares in the Infratech company, which also helped move the project forward.

⁸³ <http://www.naturschutzbund-burgenland.at/de/schutzgebiete/europaschutzgebiete/67-parndorfer-platte-heideboden.html>

financial support from the European funds under Objective 1. The municipality of Zurndorf certainly deserves all the credit for pushing wind power as a profitable investment in the region.

The Austrian electricity market opened up in 2001. Two years later, the Green Power Act came into force. For the very first time, feed-in tariffs for electricity were regulated at federal level. Until then, aid schemes were set by the *Länder*. The new law placed electricity suppliers under the obligation to buy unlimited quantities of electricity produced from renewable sources for a period of 13 years. Between 2003 and 2006, the Austrian wind power sector experienced an expansion phase. Then an amendment was passed in 2006, which put a curb on the sector's development. The feed-in tariff was only guaranteed up to a limit set by the government. In 2008, a second amendment was passed, which significantly improved the situation of green power producers. It only became effective in 2009, after a long notification procedure by the European Commission. This law and the feed-in tariff set at 9.7 euro cents/kWh put the wind power sector back on track in 2010.

Burgenland rapidly realised that wind power was an economic growth driver. In 2002, the Land set up a regional plan⁸⁴ identifying areas with a suitable wind power profile and involved all stakeholders, including bird protection NGOs, WWF, Natura 2000, the Neusiedl Nature Reserve and Vienna University of Technology. The establishment of a joint decision-making process proved an efficient solution; firstly because a joint decision allows the concerns of all regional stakeholders to be taken into consideration and prevents potential oppositions from forming; and secondly, because it reassures investors who then feel better armed to make investment plans. From the outset, the Land sought to create a favourable context conducive to the smooth development of the wind power sector.

Wind power is playing a crucial role in the region's development and other wind-related activities, like kitesurfing, a surface water sport practised with a kite-powered board, are growing in popularity. The municipalities are in favour of wind turbine construction, as they receive annual royalties for each wind turbine, this additional income ultimately benefiting citizens. To prevent potential nuisance, risk surveys are conducted, in particular by the Vienna University of Natural Resources and Life Sciences.

Other renewable energy sources have registered a significant boost in the region. The town of Güssing⁸⁵ has invested in biomass. This 4,000 inhabitant town located in the south of the Region was directly affected by the strong north-south divide. In 1989, it decided to become self-sufficient in energy to reduce its dependence on fossil energy and to reinforce the local economy by exploiting local resources. It developed an energy strategy and biomass was identified as a relevant source of energy. The European centre for renewable energy (*Europäisches Zentrum für Erneuerbare Eenergien Güssing*)⁸⁶ was created in 1996 to carry out research and innovation work. In the same year, a district heating system and a biomass boiler, the largest in Europe, were installed. The close connection between research activities and the economy is a key part of Güssing's development model, as it ensures that the facilities are technically and economically viable. Güssing then became a pioneer and gradually an international benchmark in the biomass field.

In 2003, Burgenland had in place a first energy strategy based on various energy use trend scenarios. The concept rapidly became obsolete as it did not include transport or renewable energy sources. Renewable energy – wind power in the north and biomass in the south – was supported by various players who placed increased political pressure on the regional government. Renewable energy and sustainable development were introduced in the scientific and vocational training curricula through FH Burgenland, a university of applied sciences created in 1994. Renewed interest in energy issues prompted the regional government to develop a regional energy strategy. In 2006, experts estimated that Burgenland would be able to reach electricity self-sufficiency by 2013. With this aim in mind, the government endowed the

⁸⁴ http://www.oerok.gv.at/fileadmin/Bilder/2.Reiter-Raum_u._Region/1.OEREK/OEREK_2001/Sammelmappe/3-4konzeptwindkraftanlagenbgld.pdf

⁸⁵ Town of Güssing: <http://www.guessing.co.at/>

⁸⁶ EEE: <http://www.eee-info.net/cms/>

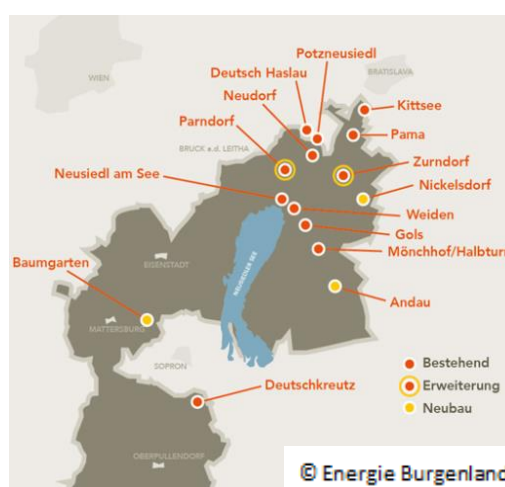
energy agency BEA⁸⁷ with the financial and human resources necessary to prepare the 2nd energy strategy, including a general action plan. In 2009, the President of the Land, Hans Niessl⁸⁸, set up the *Energieteam* committee (literally “energy team”) and appointed around twenty representatives from the regional administrative authority and the natural gas, electricity and biomass sectors. Under the auspices of the energy agency, the *Energieteam* meets four times a year to discuss development strategies and key technologies. The committee’s work and proposals have been used to build an energy strategy entitled “*Energiestrategie Burgenland 2020*”. Its main objective is to reach energy self-sufficiency by 2050⁸⁹. Seventy energy efficiency and renewable energy measures have thus been adopted. In 2013, the Land attained an interim objective, that of electricity self-sufficiency. The next step is to have 50% of end energy use covered by renewable energy sources by 2020.

3 RESULTS AND IMPACTS OF THE ENERGY TRANSITION PROCESS

3.1 ENERGY USE AND PRODUCTION IN BURGENLAND

Total energy use in Burgenland amounts to 10 billion kWh, 39% of which is produced from renewable energy sources. Average energy use per capita is 35,000 kWh and, despite population growth, only increased slightly overall between 2001 and 2011. Although the Land’s energy use was 20% below Austrian average in 2001, the gap has narrowed in the wake of Burgenland’s successful economic revival.

Over the 2001-2011 period, end energy use increased by 19%. The curve flattened in 2005, suggesting a trend reversal in favour of energy savings and energy efficiency. Industry and trade registered the highest increase, agriculture remained stable and household energy use dropped significantly. All fossil energy sources stagnated or decreased slightly, whereas renewable energy use experienced rapid growth. Electricity was produced exclusively from renewable sources by Energie Burgenland. In September 2013, Burgenland reached electricity self-sufficiency from an arithmetic point of view, with the Land producing more electricity than it uses.



By the end of 2013, Burgenland was the second Austrian Land in terms of installed capacity (829.6 MW), just behind Lower Austria⁹⁰. With a production of 222.7 MW, Burgenland supplies electricity to almost 140,000 households⁹¹. Wind turbines are mainly located in the north and the centre of the region. Impact assessment studies on the territory, fauna and flora are conducted in parallel to wind power projects. Turbine size and output are being continuously improved. Two turbines are Enercon-126⁹² turbines, the most efficient in the world, with a 135m hub height and a 7.5 MW capacity.

Data as at end 2013	Installed capacity	Number of turbines	Share of wind energy in end energy use ⁹³
Austria	1,795 MW	912	6.4%
Burgenland	829.6 MW	359	113.9%

⁸⁷ BEA : <http://www.eabgld.at/>

⁸⁸ Took over from his predecessor Karl Stix in 2000 and became President of Burgenland

⁸⁹ Energiestrategie Burgenland 2020: http://www.tobgld.at/uploads/tx_mdownloadbox/Energiestrategie_Burgenland_2020_.pdf

⁹⁰ Lower Austria is 5 times bigger and has a higher wind potential than Burgenland

⁹¹ Calculated on the basis of an annual energy use of 3,500 kWh per household

⁹² E-126 <http://www.enercon.de/fr-fr/66.htm>

⁹³ If installed capacity is exploited for one year

3.2 CREATION OF VALUE AT THE REGIONAL LEVEL

By 2004, the development of wind energy had created over 4,500 jobs, with another 400 people working in maintenance and operation. The Enercon company has part of the wind turbines produced in Zurndorf⁹⁴, due to the strong development of wind energy in Austria and neighbouring countries (Hungary, Romania, Croatia and Poland) and also to its long-term partnership with Energie Burgenland. The plant has 200 people and a production capacity of 200 towers per year, i.e. 24 tower segments per day.

Wind energy contributes to the attractiveness and reputation of Burgenland, as testified by the establishment of new companies, notably in the renewable energy sector. The E-126 turbines are an Enercon showcase for neighbouring countries. Wind energy operators have strongly increased in number. One example is Energie Burgenland, which has become the largest wind energy operator in Austria. Burgenland is recording the strongest growth in Austria, both from an economic and job creation point of view, as well as a remarkable increase in its exports⁹⁵.



In the 1990s, the development of renewable energy stimulated research and training. Today, six technological centres working with SMEs contribute to making Burgenland a major economic hub. The renewable energy centre was created in 1996 in Güssing. Between 2005 and 2014, the FH Burgenland university of applied sciences conducted or took part in over 170 projects for a total amount of over 7 million euros. With the construction of the *Energetikum* laboratory in 2014, the future of advanced research in energy and construction technologies⁹⁶ will be ensured and strengthened.

Wind energy has benefitted from record investments in the history of Burgenland. Since 2011, the Land has invested 500 million euros in extending and improving the efficiency of its wind turbines.

⁹⁴ <http://www.enercon.de/de-de/2099.htm>

⁹⁵ IG Windkraft press release: <http://www.igwindkraft.at/mmedia/download/2013.12.06/1386311924.pdf>

⁹⁶ FH Burgenland press release: http://www.fh-burgenland.at/fileadmin/user_upload/PDFs/Pressemeldungen/Meldungen2013_2014/Medieninfo_Spatenstich_Energetikum_FHBurgenland.pdf

PART 2 – ANALYTICAL INPUTS

This part provides analytical inputs on the energy transition process in Burgenland, with a focus on the specific features of this process. The first section will be dedicated to the governance model and the second to action drivers.

1 GOVERNANCE MODEL

The governance model applicable to Burgenland's transition process is based on various local initiatives and mainly centres around the logic of a region with a development gap. Involving a large number of stakeholders helped the Land reconcile the interests and needs of the majority and develop a regional energy strategy that goes beyond the sectoral approach. The involvement of local players, their motivations and means of action will be discussed.

1.1 OVERVIEW OF THE ENERGY TRANSITION PROCESS IN BURGENLAND

In order to better understand the Burgenland model, below is a chronological review of the main milestones, divided into three phases:

1) Development of pioneer projects

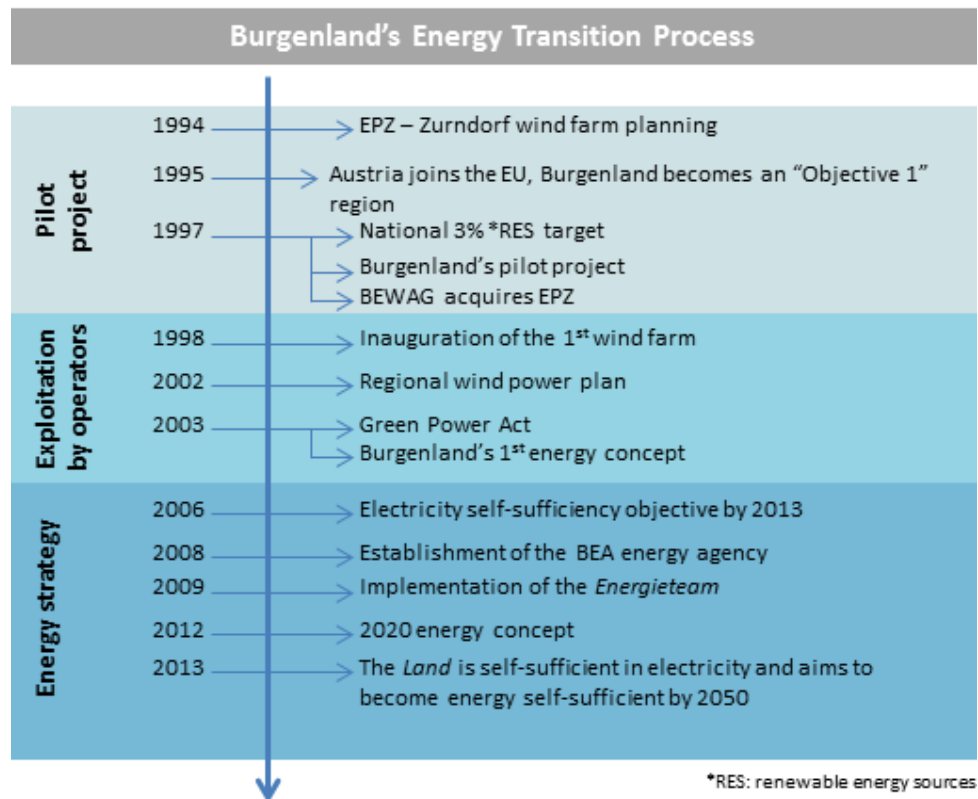
Energy transition in Burgenland started in the 1990s. Pioneer projects in the field of renewable energy then received financial support from the European Structural Funds under Objective 1 after Austria achieved EU membership in 1995. Project holders contacted regional players (the government of the Land, the regional electricity supplier BEWAG and the Objective 1 managing authority, WiBAG) to move their projects forward.

2) Wind energy exploitation by operators

Following the success of the first pilot project in Zurndorf, the regional energy supplier BEWAG decided to develop a "renewable energy" division. Wind energy economic viability and the adoption of the Austrian Green Power Act made it possible to set up projects without subsidies. The wind energy sector developed and other operators entered the market. In 2006, regional experts considered that Burgenland would be able to achieve electricity self-sufficiency by 2013.

3) Regional energy strategy preparation and implementation phase

The development of wind energy and biomass pushed the Land authorities to develop a genuine regional energy strategy. The Land set up its own energy agency, as well as a working committee (*Energieteam*) bringing together various stakeholders to prepare a 2020 energy strategy. The results are extremely ambitious and include the adoption of an energy self-sufficiency objective by 2050.



1.2 ANALYSIS OF PLAYERS' INVOLVEMENT AT EACH PHASE

Each phase of the energy transition involves its own set of players that reflects the stakeholders' needs and visions and depends on their means of action.

PHASE 1: THE WIND FARM PROJECT

- **Zurndorf and EPZ GmbH:** the municipality of Zurndorf decided to have a wind farm installed in its territory so as to position itself as an innovative, environmentally-friendly municipality with a high quality of life. In 1994, the municipality established the *Energieprojekt Zurndorf GmbH* (EPZ) company to create a more efficient and responsive structure. Zurndorf became the majority shareholder with a 98% interest and the mayor the first managing director. An advisory committee composed of local experts and representatives from all the political groups on the council guaranteed the municipality's democratic participation. Zurndorf made sure that the inhabitants and local players were included in the project (especially hunters and conservationist groups) via consultation phases, thus taking into account their concerns. Due to the costs involved and the difficulty in implementing the project, the municipality finally sold EPZ to the local energy supplier BEWAG in exchange for an occupation royalty for each wind turbine
- **BEWAG** is the regional energy supplier and an indispensable partner in the feed-in tariff negotiations for wind power. At first, the company opposed any increase in the feed-in tariff for fear that the financial burden would be too heavy. The negotiations resumed when BEWAG was restructured and the new management committed to developing renewable energy. Finally, the 1997 Austrian directive on the development of renewable energy convinced BEWAG to acquire EPZ.
- **The government of Burgenland** was favourable to the wind farm project and BEWAG's majority shareholder. However the negotiations failed. It was the national directive on the development of

renewable energy which gave the Land the opportunity to regain a strong position and give the wind farm pilot project status.

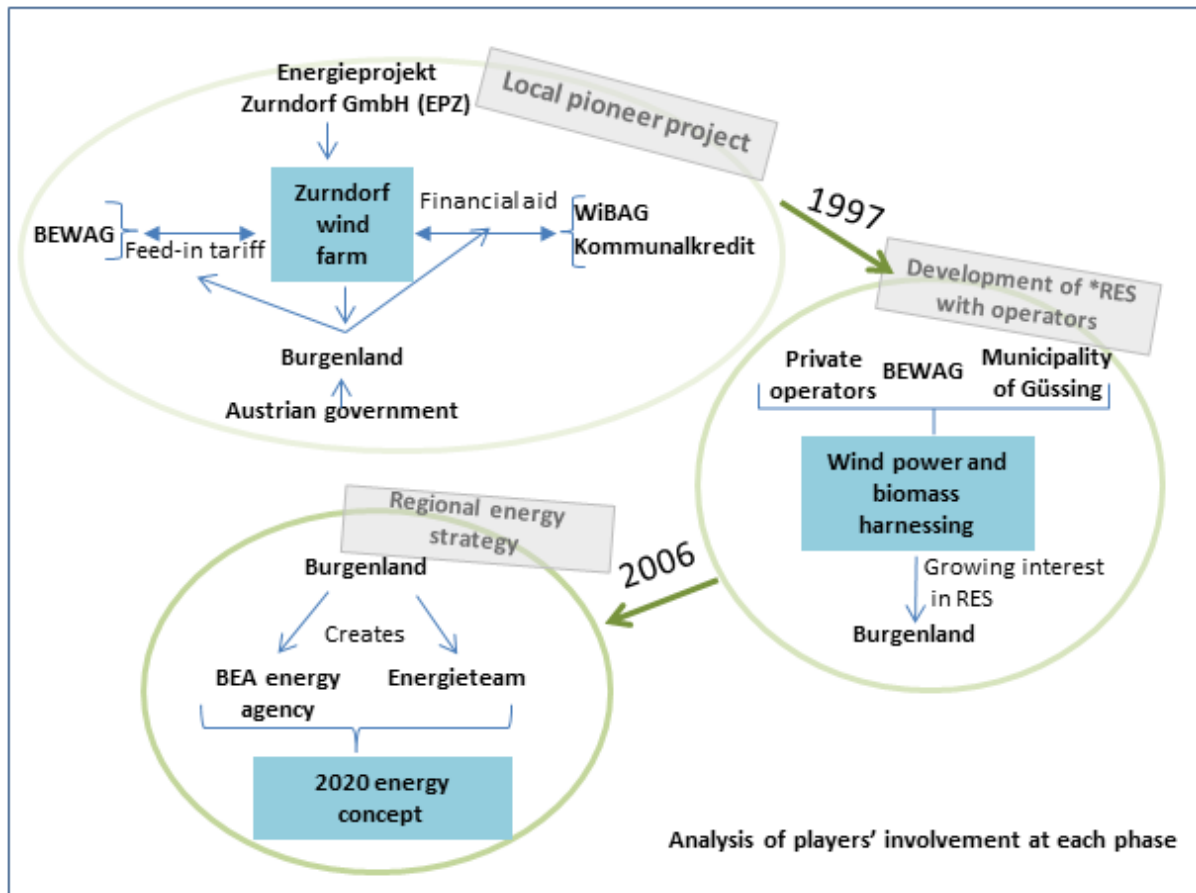
- **WiBAG** is a company 100%-owned by the Land which is responsible for managing the European Structural Funds in the region. After confirmation of the wind farm project, WiBAG was entrusted with defining the best financing option and identifying the organisations to be associated with the project. In cooperation with the Land, it led the last round of negotiations to increase the feed-in tariff paid by the energy supplier BEWAG and improve the profitability of the farm.
- **The Austrian government** had a direct influence on the development of the negotiations by deciding in 1997 to raise the share of renewable energy to 3% of national energy use. The investment subsidy agreement with *Kommunalkredit*, the organisation in charge of managing the Austrian Green Fund, ensured the economic viability of the wind farm.
- **The local and regional media** took great interest in the negotiations between the small town of Zurndorf, the regional supplier BEWAG and the government of the Land. They followed the case with keen interest and kept the local people informed of the discussions. They thus put pressure on the regional players anxious to convey a positive image.

PHASE 2: ROLLING-OUT RENEWABLE ENERGY SOURCES

- **BEWAG** developed wind energy as it proved a profitable business and the Green Power Act provided a favourable framework. Other operators entered the renewable energy market and technological advances increased turbine efficiency.
- **Burgenland** noted the rising tide of renewable energy, acknowledged its growth potential for the Land and decided to design a development strategy in collaboration with key local players.

PHASE 3: PREPARATION OF A REGIONAL ENERGY STRATEGY

- **Burgenland** created structures to coordinate a concerted regional approach. The energy agency BEA was given adequate human and financial resources and the Land appointed energy sector representatives to the *Energieteam* working committee.
- **The energy agency BEA** was entrusted with preparing an energy concept with a specific objective: to achieve energy self-sufficiency by 2050. In close collaboration with the University of applied sciences, the agency prepared energy supply scenarios with detailed environmental and economic impacts. The agency supervised the *Energieteam* committee work, in order to determine development options taking the Land's needs, aspirations and available resources into account.
- **The *Energieteam* working committee** is composed of about twenty representatives of the regional administration and the energy sector (wind energy, natural gas, biomass, etc.). The committee is responsible for discussing the strategies to be adopted to achieve energy self-sufficiency taking a cross-sectoral approach.



2 ACTION DRIVERS

This part reviews the factors that have reinforced the energy transition process, taking into account the difficulties and opportunities in implementing a regional energy strategy.

2.1 POLITICAL WILL AND PERSEVERANCE

The determination to pursue an ambitious energy and environmental policy was a prime factor in Zurndorf. The wind farm project thus benefited from strong political support, which helped compete with other similar projects. Additional factors include the municipality's ability to take initiatives and its capacity to maintain focus in complex, long-term negotiations.

2.2 CONSIDERABLE FINANCIAL SUPPORT

For Burgenland, Austria's accession to the European Union proved a financial bonanza. The region was integrated into Objective 1 of the European Structural Funds for a period of 11 years and thus benefited from over 985 million euros in investments⁹⁷. The first wind farm project would not have got off the ground without the subsidies from the European Structural Funds and the Austrian Environmental Fund. The establishment of feed-in tariffs for green electricity has also improved the long-term situation of energy producers.

⁹⁷ <http://www.phasing-out.at/de/online-broschueren/49>

2.3 A LOCAL ECONOMIC POTENTIAL TO BOOST THE REGIONAL ECONOMY

Energy producers invested in wind energy as soon as its profitability was established. The Land rapidly became aware of the sector's development potential at the regional level and prepared a regional energy strategy. Priorities for the future years were then decided with the players involved.

2.4 A PARTICIPATIVE APPROACH AT ALL LEVELS

The importance of involving citizens and stakeholders was highlighted at several stages of the energy transition process. In the initial phase, the municipality of Zurndorf informed local people through public meetings and took account of stakeholders' concerns (hunters and conservationist groups). In the 2000s, the Land identified those areas suitable for wind power development and launched a regional initiative bringing together representatives from NGOs, universities and the energy sector. To prepare its 2020 energy concept, the Land appointed an energy expert committee: the *Energieteam*. The objective was to create a situation which is favourable to the highest number whilst identifying and implementing cooperation and synergies to reinforce the process.

2.5 A FAVOURABLE REGULATORY FRAMEWORK

The Austrian Green Power Act stimulated the renewable energy sector. It provided green electricity producers and investors with a favourable and stable framework.

2.6 CLOSE CONNECTION BETWEEN SMEs, RESEARCH AND TRAINING

The large development of renewable energy has also influenced research (European centre for renewable energy in Güssing) and training sectors (FH Burgenland, university of applied sciences), which has helped build a genuine competitiveness cluster in the region. The collaboration between researchers and businesses has led to the efficient exploitation of research results and to technology transfers to SMEs. The training sector is training experts for positions in the renewable energy, energy efficiency and sustainable development field.

PART 3 – RESOURCES

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HEIDELBERG (GERMANY): THE EPIPHANY OF SUSTAINABLE URBAN DEVELOPMENT



The city



Heidelberg
Germany

150,000 inhabitants

Symbol



With its 116 hectares, Bahnstadt will be the world's largest passive district

© heidelberg-bahnstadt.de

Key figures

40% is the CO₂ emission reduction rate achieved in the building sector between 1987 and 2011

5,000 people will live in the world's largest passive district (Bahnstadt) and a further 7,000 will work there

3.1% is the unemployment rate for young people in Heidelberg – half the national average

Milestones

1990 Beate Weber, the newly elected mayor of Heidelberg, decides to make sustainable development a priority – Internal restructuring and creation of the Environmental office

1991 The municipality entrusts the Institute for Energy and Environmental Research with developing a CO₂ emission reduction programme.

1992 The 200 measures presented by the Institute are included in the Heidelberg's Climate Protection Concept

1993 Implementation of an energy management system in municipal buildings – Launch of a financing programme for retrofitting existing buildings

1995 Launch of roundtable discussions on energy and the climate: the city wants to engage local players – Large-scale campaign on energy savings in schools

1997 Following the roundtable discussions, Heidelberg creates the energy and climate protection agency in association with a neighbouring city

2001 The roundtable discussions lead to the "Heidelberg Circle for Energy and Climate Protection" - Launch of the "Sustainable management in SMEs" project

2007 Wide-ranging energy-saving awareness campaign

2009 Beginning of the construction of the world's largest passive district

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KEY POINTS TO REMEMBER

The energy transition process was initiated by the City of Heidelberg in the early 1990s, triggered by growing awareness of climate protection issues and, ultimately, a change in the leadership of the city. The first steps consisted in analysing emissions and redefining the municipality's internal organisation so as to offer optimal working conditions with the creation of an environmental office and the allocation of additional staff. In 1992, the city council adopted the first climate protection concept and the energy concept prepared by IFEU, Heidelberg's energy and environmental institute. The climate protection concept covered energy management in municipal buildings and city-wide, thus addressing all the energy-using sectors and players concerned. The originality of the concept lay in the fact that as well as providing technical solutions, it also included an analysis of the obstacles and avenues for raising key players' awareness. Implementation of the concepts was monitored through periodic CO₂ emission reports.

The energy transition process has been built jointly with key local players through roundtable discussions. The city has developed a truly participative approach with the energy and climate protection circle as its most emblematic symbol. The city council wants Heidelberg to be a role model in energy management. The energy concept has led to the adoption of low energy standards for new municipal buildings that are stricter than national regulations and to low energy requirements for building plots sold by the municipality. The climate protection concept and the energy concept were reviewed in 2004 and again in 2010. Between 1987 and 2011, CO₂ emissions in the public building sector dropped by 40%.

The municipality works in close cooperation with schools through various projects to include energy education in the curriculum and with SMEs to implement an environmental management system. The municipality considers communication as a means of raising citizens' awareness and has developed an innovative communication strategy. Participation in regional, national and international projects has also enabled Heidelberg to benefit from additional funding and to promote further interest in the energy issue. The municipality has become a member of European local authority networks and has joined the Covenant of Mayors.

The world's largest passive district is currently being built in the heart of the city. In 2012, Heidelberg became a model municipality for "Masterplan 100% Klimaschutz", a climate-neutral-city programme led by the Federal Ministry of the Environment, with the following targets: reduce CO₂ emissions by 95% and cut energy use in half by 2050.

PART 1 – HEIDELBERG’S ENERGY TRANSITION CHRONICLES

1. HEIDELBERG, A GREEN CITY OPEN TO THE WORLD

Heidelberg is a city situated on the River Neckar in a mountainous region in the Land of Baden-Württemberg, south-west Germany. The municipality lies at an altitude of 114m and covers 109 km²⁹⁸, 30% of which are inhabited. Heidelberg is part of the densely populated Rhine-Neckar⁹⁹ urban area. It is home to 150,000 inhabitants and has a young population (35% are under 30 and 16% are over 65). With 17% of foreigners, the city is known for its international atmosphere and openness to the world. Around 38,000 students study at the oldest university in Germany, founded in 1386, or at one of the many engineering university institutes. Heidelberg has research centres of international renown. In this city of knowledge, the municipal departments and the scientific community work in close collaboration. The city employs 111,000 people, of which 87% in the tertiary sector. The unemployment rate was 5.3 % in 2012¹⁰⁰.



Climate protection and the environment are a tradition in Heidelberg. Over the years, the city has made a name for itself as an environmental protection and sustainable development capital thanks to its wide-ranging network of partners. Heidelberg was the first German city to develop a climate protection concept in 1992. The world's largest passive district (Bahnstadt) is also being built in Heidelberg. The city has received two European Sustainable City awards and is a model municipality under the “*Masterplan 100% Klimaschutz*”¹⁰¹ programme of the Federal Ministry of the Environment. Its objective is to reduce its CO₂ emissions by 95% and to halve its energy use by 2050.

2. ENERGY TRANSITION, A KEY COMPONENT OF MUNICIPAL STRATEGY

2.1. IT ALL STARTED WITH A POLITICAL CHANGE

Increased global awareness of the importance of sustainable development and environmental conservation resulted in the creation of the World Commission on Environment and Development in 1983 and led to the Brundtland report, “Our common future”, in 1987. In Heidelberg as in the rest of the country, debates were organised on the theme of environmental protection. One of the main issues for the municipality was the local transport policy, because of its environmental impact and the large number of commuters travelling to and fro the city daily. In the energy field, Germany -like the rest of Europe- was deeply shocked by the 1986 Chernobyl nuclear disaster and debates on energy-related issues were organised in many municipalities.

In 1990, Beate Weber was elected mayor of Heidelberg. It was a transition year in local political life for it marked the end of a very long series of terms of office (24 years) held by her predecessor. Beate Weber

⁹⁸ <http://ww2.heidelberg.de/datenatlas/>

⁹⁹ <http://www.m-r-n.com/>

¹⁰⁰ http://www.heidelberg.de/site/Heidelberg_ROOT/get/documents/heidelberg/Objektdatenbank/12/PDF/12_pdf_HeidelbergerStatistik2012.pdf

¹⁰¹ <http://www.klimaschutz.de/de/projekt/masterplan-100-prozent-klimaschutz-der-stadt-heidelberg>

joined the Social Democratic Party (SPD) in 1970. Before becoming mayor, she sat for ten years as city councillor (1975-1985). She was also a member of the European parliament (1979-1990), where she chaired the environmental, public health and consumer policy commission. At that time, there were few mayors with experience in environmental issues, most having a political science and administrative background. On taking up office, Beate Weber made sustainable development her central priority, giving it a triple-faceted economic, environmental and social dimension.

The Board of Inquiry of the German federal parliament launched a call to adopt measures aimed at reducing energy use and pollutant emissions as part of the “Atmosphere Protection”¹⁰² programme. Later on, the United Nations Conference on environment and development organised in Rio de Janeiro in 1992 underlined the impact of energy usage on climate change and encouraged local participation, especially through Local Agenda 21 initiatives.

2.2. THE EARLY STAGES: HEIDELBERG DEVELOPS AN ENERGY MANAGEMENT STRATEGY



The new municipal team started by restructuring the organisational structure. The municipal authorities were required to be independent and to work transparently, but also to use and create better communication structures, to set up local networks and to provide services to citizens. Local centres were created in neighbourhoods so that citizens could carry out administrative procedures without having to travel long distances.

Restructuring included creating an environmental office (*Umweltamt*) to replace the pollution control office (*Immissionsschutz*), thus giving environmental issues a more cross-sectoral dimension. The new department covered a vast range of fields, including environmental protection, climate change, air and noise pollution. In terms of sustainable development, it appeared essential that the municipality should set an example. This is why the elected representatives decided to improve municipal buildings to promote the city as an

example of energy efficiency.

In 1991, Heidelberg commissioned Heidelberg’s Institute for Energy and Environmental Research (IFEU) to develop a programme to reduce CO₂ emissions. The survey was carried out as part of the Federal “Atmosphere Protection” programme aimed at reducing emissions by 25 to 30% by 2005. The IFEU institute identified 200 measures that were transposed into the Heidelberg climate protection concept adopted in December 1992.

According to the mayor, one of the key conditions for a successful sustainable development policy is the capacity to engage businesses, the government and civil society. The local participation mechanism emerged in the 1990s, when the mayor invited all interested citizens and organisations to participate in the transport forum (*Verkehrsforum*). For the city council, the objective was to collect input on transport. Over 60 recommendations were collected and adopted after minor revisions. Although some political parties were reluctant to adopt this participatory process, its usefulness was finally acknowledged when a number of citizens showed encouraging commitment and when results became tangible. Following this experience, the municipality felt better armed to promote active participation and the involvement of stakeholders and started to build the image of a city of dialogue. A whole series of public participation projects and public campaigns were then organised.

¹⁰² Enquete-Kommission “Schutz der Erdatmosphäre”

To play its role as a model, the city developed an energy management concept aimed at reducing both CO₂ emissions and energy costs. The environmental office, which only had two employees in 1992, recruited two additional experts in 1993. A baseline survey of municipal facilities was conducted in 1992 to draw up a list of the municipal buildings in most need of renovation. An energy management system was set up in 1993, allowing energy use in office buildings and schools to be measured and analysed. Behavioural changes helped reduce energy use by 5% for electricity and 15% for heating between 1993 and 1998.

The Heidelberg energy concept was prepared by a working group composed of representatives from the city council, the municipal company *Stadtwerke Heidelberg AG* and the municipal authorities. The concept included a “low energy” standard applicable to new municipal buildings and premises sold by the municipality, the definition of a “low energy” standard applicable to urban renovation projects and the transformation of the municipal company into a service company. Verifications were also made to ensure responsible, energy-focused urban planning. A report ordered from the Darmstadt environmental institute listed the official low energy building standards and a solar energy optimisation survey was carried out for local development plans.

2.3. LOCAL PLAYERS’ INVOLVEMENT AND FINANCIAL SUPPORT

In 1995, the city continued its climate protection work by organising a roundtable forum on energy as part of a national CO₂ emission reduction campaign. The roundtables had around 25 members, including influential local community members and representatives of businesses and service organisations. The discussions were led by moderators, with the support of environmental experts. The first roundtable forum was aimed at developing a joint initiative with all building sector players to adopt CO₂ emission reduction measures through retrofitting work. This first series of roundtables led to the creation of the “Heat Pass” (*Wärmepass*). A second series of roundtable discussions organised in 1998 focused on renewable energy, and solar energy in particular. The discussions were open to all stakeholders from the energy and climate sector as well as to municipal partners. The participants debated and developed strategies and projects, and made recommendations for the city’s energy and climate policy. The discussions demonstrated the importance of having a discussion and knowledge-sharing forum of this kind. Another objective was also to institutionalise cooperation at the regional level. The members suggested creating a climate protection and energy agency in cooperation with neighbouring cities, which led to the creation of the KliBA agency (*Klimaschutz- und Energie-Beratungsagentur Heidelberg-Nachbargemeinden*) in 1997 with financial support from the European Union.

During the same period, the municipal authorities decided to involve schools in their sustainable energy policy. In 1995, the city and the IFEU institute organised an energy saving campaign in Heidelberg’s schools, inviting schoolchildren and teachers to work on energy-related issues. The city asked primary and secondary schools to participate in a project aimed at integrating courses on the rational use of energy into the curriculum. The increased awareness shown by the children and their real desire to take action led IFEU to set up “E-Teams¹⁰³”, i.e. groups of ten to twenty children, teachers and other staff members anxious to reduce their school’s energy use. The campaign used schools to reach out to children and tell them how to reduce energy use in all aspects of their lives. In total, twenty schools had participated in the campaign by 2014.

Heidelberg again showed its willingness to act by providing the necessary financial resources. On the one hand, the environmental office hired additional staff and funds were made available for the rehabilitation of municipal buildings. On the other hand, the city decided in 1993 to develop a financing scheme for the energy renovation of existing buildings. The logic behind this choice was simple: in a dense city, new buildings are rare and improving the city’s energy efficiency therefore involves retrofitting existing ones. Over 110,000 euros per year were made available in the form of subsidies. In the first two years, these

¹⁰³ <http://edoc.difu.de/edoc.php?id=RKUFPIZG>

subsidies were under-used. It was only when local builders, architects and chambers of commerce helped disseminate the information that financing applications started to come through. The financing scheme proved useful to builders for several reasons: owners were able to benefit from financial support and it helped develop sustainable construction skills and expertise.

2.4. CONSOLIDATION AND INSTITUTIONALISATION OF THE TRANSITION PROCESS

In 2001, roundtable discussions rapidly developed and led to the creation of the “Heidelberg Energy and Climate Protection Circle” (*Heidelberg-Kreis Klimaschutz und Energie*), a committee in which all energy and climate protection stakeholders are represented: universities, businesses and social institutions cooperate under the aegis of the Director of the Municipal Energy and Environmental Department and the Office of Environmental Protection, Trade Supervision and Energy. The committee is responsible for discussing the climate protection strategy and for preparing guidelines for the renovation and construction of municipal buildings. Another aspect of its activities focused on the debate surrounding the introduction of a “Heidelberg standard” based on the city’s energy strategy model.

The “Energy and Climate Protection Circle” is made up several groups:

- Optimising ventilation equipment at the university and teaching hospital,
- Improving building energy efficiency,
- Geothermal energy,
- Saving energy by changing behaviour in university buildings,
- Saving energy in churches,
- Improving energy efficiency and rebuilding municipal property,
- Sports and environment project,
- Energy advisers.

The working groups meet twice or four times a year to implement their projects. The committee also encourages players outside the municipal administration to identify energy saving potentials in their respective spheres of influence and to take measures involving building planning, organisation or behavioural changes.

The participation of SMEs was a major step. The “Sustainable management in Heidelberg’s SMEs” (*Nachhaltiges Wirtschaften*) started in 2001 with the financial support of the German Federal Environmental Foundation (DBU), on the basis of the recommendations made by the roundtable forum of sustainable businesses initiated in 1998. The city wanted to help small and medium-sized companies (10 to 200 employees) implement an environmental management system. The municipality first contacted hairdressers and bakers, who are heavy energy users. Many showed reluctance as they were surprised – and even worried- at being asked to act in favour of the environment. A climate of mutual trust first had to be built between the SMEs and the municipality, with as the watchword, “suggest rather than forbid” (*Angebote statt Verbote*). Professionals soon realised that they could save on their energy bills by reducing their energy use.

Communicating with the general public was part of the municipality’s new tasks and several campaigns were organised in Heidelberg. The most emblematic one is no doubt the “Climate seeks protection” (*Klima sucht Schutz*) campaign launched in 2007. The campaign consisted of a series of posters featuring citizens and municipal staff and aimed at raising awareness of climate change and what can be done about it. One of the objectives was to use pictures of the city’s charismatic figures, well-known for their professional activities, to arouse interest amongst the population. In 2010, the European campaign

ENGAGE¹⁰⁴, which aims at helping local authorities highlight their citizens' commitment to climate protection, was also launched.

Heidelberg also took part in regional, national and international projects¹⁰⁵. The city became a member of the local authority networks ICLEI in 1992, Climate Alliance in 1994 and Energy Cities in 1996, whose President since 2007 has been the Mayor of Heidelberg, Eckart Würzner. In 2008, Heidelberg was among the first local authorities to join the Covenant of Mayors¹⁰⁶.

The city took part in a number of competitions¹⁰⁷, a way to put new perspectives on local issues and to measure progress against other cities. The city's engagement in different networks contributed to enriching thinking, encouraging those involved and ensuring financing for projects carried out jointly with other cities.

The decisions made by the city show the efforts deployed to integrate energy in a cross-sectoral way into municipal policies. In 2001, the city council decided to spend 330,000 euros a year on buying green electricity to achieve the 25% target of renewable energy in municipal buildings. The same municipal order created a renewable energy fund, financed through a 4.6 cent/kWh additional charge (in 2006) to be paid for the municipal company's green electricity supply. The city of Heidelberg owns one third of the company, which helped implement the green supply offer.

The 1992 energy concept was updated in 2004, and again in 2010 following a decision by the city council. This essential component of urban planning created the "low energy" standards in municipal buildings in 1992. Its revision set up stricter building insulation standards and created standards for cooling requirements in summer. The standards defined are well above national requirements.

One of Heidelberg's flagship projects was the construction of the world's largest passive district. The Bahnstadt district (see image above) is being built on the site of a former freight depot disused since 1997. This new urban area will help the city meet urgent housing needs. The district benefits from a central location. With its 116 hectares, it will be larger than the city centre and is planned to host 5,000 residents and 7,000 employees. The first stone was laid in 2009 and work is expected to last until 2022. The first residents moved in in June 2012.

¹⁰⁴ <http://www.citiesengage.eu/>

¹⁰⁵ http://www.heidelberg.de/hd_Lde/HD/Leben/Kooperationsprojekte.html

¹⁰⁶ www.eumayors.eu

¹⁰⁷ http://www.heidelberg.de/hd_Lde/HD/Leben/Umwelt+Auszeichnungen.html



In the same year, Heidelberg answered a call for proposals for the “Climate protection masterplan” (« *Masterplan 100% Klimaschutz*¹⁰⁸ »), financed by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). The project was presented jointly by the city, the municipal company, the university, the teaching hospital, the savings bank *Sparkasse*, *KliBa*¹⁰⁹ and *UKOM*¹¹⁰. The city was selected amongst 19 other municipalities in 2012 and therefore committed to reducing CO₂ emissions by 95% and halving energy use by 2050 compared to 1990.

This four-year project includes two phases: preparation of the masterplan (2012-2013) and implementation of the first measures (2014 -2016). IFEU was responsible for the first phase. It set up a conceptual framework for defining the masterplan through the “Heidelberg Energy and Climate Protection Circle”, public consultations and a youth municipal council. Polls show that most inhabitants agree that Heidelberg is a climate protection pioneer.

3. RESULTS AND IMPACTS OF HEIDELBERG’S ENERGY TRANSITION¹¹¹

3.1. END ENERGY USE AND CO₂ EMISSIONS

The city’s energy use (except transport) increased by 11% between 1987 and 2011. The peak was reached in 2004 with an 18% increase compared to 1987. Since then, end energy use has decreased by 7%.

CO₂ emissions (except transport) increased by 7% between 1987 and 2002 and then dropped 10% by 2011. The reduction in CO₂ emissions seems to contradict the increase in end energy use. The substitution of energy sources helped reduce CO₂ emissions. The switch from fuel oil to natural gas and district heating has contributed to reducing CO₂ emissions, even in the absence of energy savings. The commissioning of the CHP unit at the teaching hospital in 2012 resulted in a more efficient use of fuel gas. In 2011, CO₂ emissions per inhabitant amounted to 6.5 tonnes (except transport), i.e. an 8% reduction compared to 1987 (7.1 tonnes per capita).

Households’ end energy use amounted to 987,600 MWh in 2011, i.e. 36% of total end energy use, closely followed by the public sector (34%). CO₂ emissions remained roughly stable between 1987 and 2006. It should be noted that the average housing unit surface area increased by 18% over the same period.

¹⁰⁸ <http://www.heidelberg.de/hd.Lde/HD/Leben/Masterplan+Klimaschutz.html>

¹⁰⁹ Heidelberg and neighbouring municipalities’ energy and climate protection agency

¹¹⁰ Rhine-Neckar environmental centre

¹¹¹ Data from “Endbericht - Konzept für den Masterplan 100 % Klimaschutz für die Stadt Heidelberg”, April 2014

The all-time winner of the CO₂ emission reduction contest is the public building sector: minus 40% between 1987 and 2011, over 50% if the 1993 peak is included.

The diagram below shows Heidelberg's CO₂ emissions for 2011 per sector and energy source, except transport, adjusted for the climatic factor (© "Endbericht, Konzept für den Masterplan 100 % Klimaschutz für die Stadt Heidelberg", April 2014)

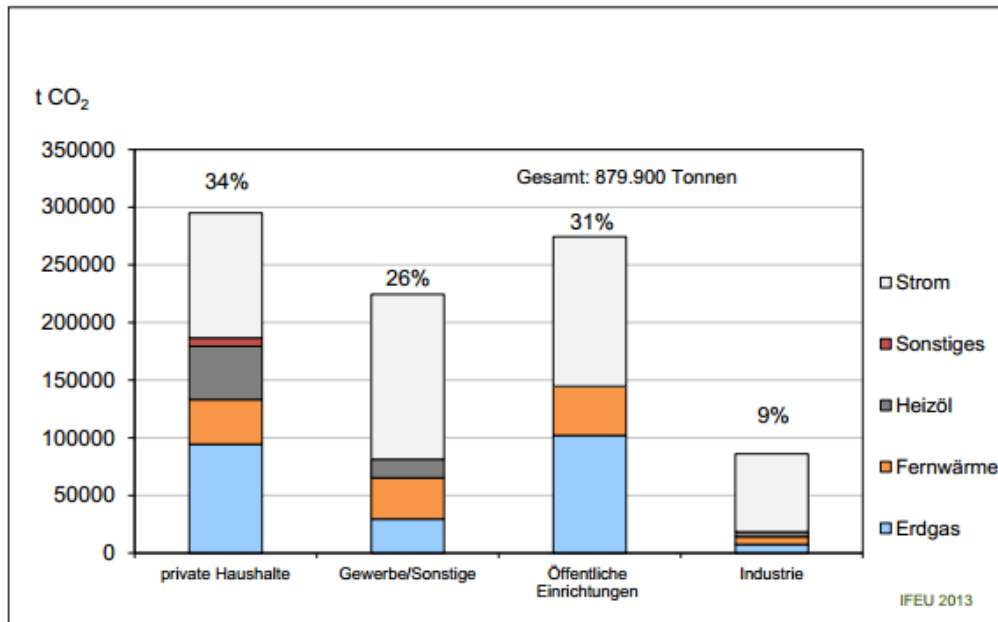


Abb. 12: CO₂-Emissionen in Heidelberg 2011 nach Sektoren und Energieträgern (ohne Verkehr, witterungskorrigierte Darstellung)

Total greenhouse gas emissions amounted to 1.2 million tonnes in 2010. Transport was responsible for 28%, households for 24%, the public sector for 21%, trade for 19% and industry for 8%.

In total, 40 GWh of electricity and 47 GWh of heat were generated from renewable sources in Heidelberg in 2011, covering ca. 6% of the city's total electricity use and 2.5% of its heating requirements.

Heat is produced from a variety of energy sources, biomass being the most important. In 2011, 10 GWh of heat were generated from biogas, 1 GWh from wood pellets, 1.5 GWh from solar energy, 32 GWh from biomass wood and 2.7 GWh from geothermal energy.

Since Heidelberg lies on a river, hydropower has become a major source of electricity with production of 15 GWh. The proportions of biogas (5 GWh), landfill gas (4 GWh), biomass (5 GWh) and photovoltaics (10 GWh) are below the national average. Wind energy is non-existent, although it accounts for 8% of energy production in Germany.

3.2. SOCIOECONOMIC STATE OF THE ART¹¹²

Economic statistics show a strong decrease in the unemployment rate. The negative effects of the world financial and economic crisis that were felt in Heidelberg seemed to have disappeared by 2010. The city derives great benefits from being a scientific city. Research institutes, the university and the teaching hospital are responsible for the strong increase in employment growth. A negative trend, however, is to

¹¹² http://www.heidelberg.de/site/Heidelberg_ROOT/get/documents/heidelberg/Objektdatenbank/12/PDF/12_pdf_HeidelbergerStatistik2012.pdf

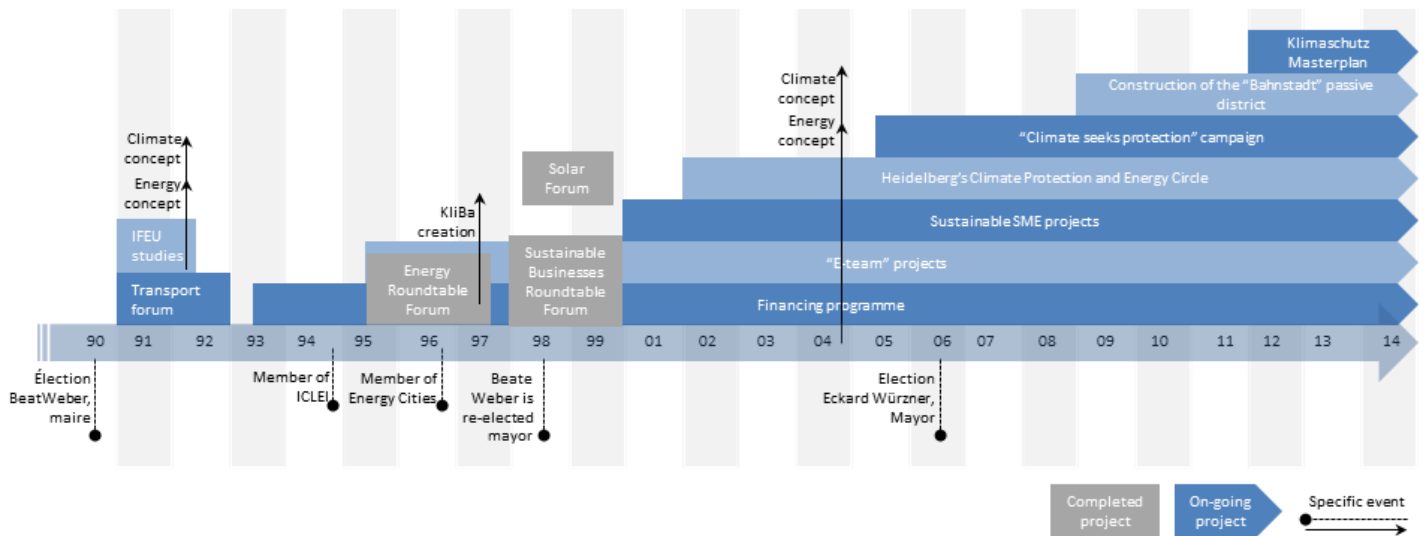
be observed in agriculture and manual trades. Total unemployment rate was 5.1% in 2012. Youth employment improved with a 3.1% unemployment rate, half the national average. The poverty risk rate¹¹³ is very low (7.7%). In Germany, the average rate is 14.6%. Demographic developments create new social challenges: an aging population, low birth rate, migration. For Heidelberg -unlike many other German cities- a net population increase is expected until 2020.

The city is committed to providing citizens with the best opportunities to be part of the city's life. Reinforcing the public participation process is one of the city's main concerns and goes well beyond the legal requirements. Inhabitants are involved in the urban planning process and are a genuine source of proposals for the public authorities and the city council. To ensure the smooth operation of citizen participation, guidelines have been established in consultation with the inhabitants¹¹⁴.

¹¹³ <http://www.iweps.be/lexique/taux-de-risque-de-pauvrete>

¹¹⁴ http://www.heidelberg.de/site/Heidelberg_ROOT/get/documents/heidelberg/Objektdatenbank/12/PDF/12_pdf_Buergerbeteiligung_Leitlinien_Komplettfassung.pdf

PART 2 – ANALYTICAL INPUTS



1. THE GOVERNANCE MODEL

- Heidelberg's energy transition is a continuous process in constant flux. The diagram below shows the main events and projects carried out by the city as part of its sustainable governance strategy over time.

Main governance model drivers:

- The personality and background of Beate Weber, who was elected Mayor in 1990, were a key driving force in the energy transition process;
- Internal changes to the municipal authorities and internal restructuring were the first steps towards a strategy focused on energy and sustainable development;
- The city council was anxious to set an example as regards energy issues;
- The "dialogue city" model made it possible to bring many key players together and involve them in the process. Their participation was institutionalised in a climate of trust between citizens, local players and the municipal authorities;
- The local academic centres (university, IFEU) helped design the strategy;
- The city benefited from various national and European projects as a pioneer city, thus ensuring the financing of various local projects.

The coordinating organisation responsible for supervising and implementing the energy and climate strategy is the Office of Environmental Protection, Trade Supervision and Energy under the aegis of an elected representative. The office covers a wide range of activities and is therefore able to coordinate the strategy in a cross- and inter-sectoral way. From a political point of view, the strategy is well-defined and presented in binding documents approved by the city council. Clear objectives have been defined and Heidelberg is committed to reducing its CO₂ emissions by 95% and halving its energy use by 2050 compared to 1990. Public participation is integrated in the strategy and actively encouraged. Key players from the energy sector, SMEs and citizens are engaged in the process, coordinated by the municipal authorities, with the support of elected representatives. The city also assesses and monitors its strategy on a regular basis.

3. ACTION DRIVERS

This part covers a wide range of action drivers from the Heidelberg model that opened the way to energy transition and proved to be a driving force.

2.1 GLOBAL AWARENESS

This factor triggered the debate on the role of Heidelberg in climate protection and the place of energy in urban society.

2.2 SEASONED POLITICAL LEADERS IN THE FIELD OF SUSTAINABLE DEVELOPMENT

Beate Weber (elected mayor in 1990) had experience in the field of energy and the environment and was utterly convinced of the importance of sustainable development. A former European MEP, she had good knowledge of European programmes and could obtain financing for the city's projects. The current mayor, Eckart Würzner, used to work for the city's environment and energy department and continues the strong vision of energy and environmental protection in the city's policy.

2.3 REORGANISATION OF THE MUNICIPAL AUTHORITIES

The creation of an office dedicated to energy and the environment with a broad scope of activity made it possible to address energy transition in a cross-sectoral way. The office acts as a steering committee: it prepares the strategy and defines the action plan, with clear objectives and a budget.

2.4 THE PARTICIPATION PROCESS

Involving local stakeholders appeared essential from the outset of the process. Roundtable discussions and participative projects opened the way and prepared the city's energy transition process. Public participation was initiated by the municipal authorities and resulted in very positive responses from citizens and local stakeholders. Today more than ever, Heidelberg is known for being a city of dialogue and cooperation: "Acting together for living together".

2.5 MONITORING AND EVALUATION

The municipality makes it a point of honour to constantly monitor the implementation of its strategy in terms of organisation, administration, financing, public participation, etc. This ensures that the continuous energy transition process is given an adequate framework and that strategic adjustments are made based on the results obtained.

PART 3 – RESOURCES

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