

Utrecht: Energetic heart of the country

Utrecht Energy Plan



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2. The starting point: we followed a unique process

This energy plan is the result of the city-wide conversation on Energy which took place on three Saturdays: 14 March, 28 March and 18 April 2015. A group of 165 Utrecht residents, put together by lottery, took part in this conversation. Over the course of three Saturdays, we dreamed, talked and thought about a future climate-neutral energy provision in Utrecht.

In our conversations we observed that our views and ideas differed, but we came up with new and creative solutions that enjoyed broad support. We discussed a large number of measures. This plan contains the measures to which we believe Utrecht needs to commit itself fully. Linked to those measures, we also set out the limiting conditions we believe are important. In order to come up with the energy plan, we not only spent three days holding various conversations with one another in different ways. We also absorbed a lot of knowledge about the energy and climate issue, which we were able to put to use straight away. As a result, we now have an energy plan that almost completely fulfils the task we were set: to achieve a climate-neutral Utrecht. The challenge now is to put it into practice.

This energy plan is offered to the Municipal Executive for approval and for presentation to the Utrecht municipal assembly. We followed a unique process. We are curious to hear the responses and the follow-up steps which the assembly takes based on this plan. Which actions will it initiate? And which agreements will it make with important players in the city?

165 residents of the city

3. The dream: A climate-neutral Utrecht

The future dream of Utrecht is consistent: Utrecht as a clean, sustainable, green and safe city. Emissions of CO₂ from energy use have been reduced to zero. And thanks to good air quality and a healthy living environment, Utrecht is a place where everyone enjoys living, studying, working and relaxing. Our dream for Utrecht is a city that is bold and has ambition, energy, courage and vision.

This energy plan puts flesh on the bones of that dream. The starting point for this plan is that it forms an integrated whole with other policy objectives, such as those for air quality, green space, health and participation. We have aimed for solutions that enjoy broad support and incur the lowest possible social and financial costs.

The implementation of this plan calls for intensive partnership and coordination between different parties in Utrecht – on our streets, in our neighbourhoods and in Utrecht as a whole. In the future, the municipal executive and the parties responsible for taking measures will do an even better job of informing residents and firms, they will take them to task on their shortcomings and help them to save energy. What the municipal authorities do in terms of policy and measures will be visible and accessible to everyone in the city. We will reward good behaviour and punish bad behaviour. In addition, the municipal authorities will play a bigger role in organizing the funding of measures.

The energy plan is a plan owned by Utrecht and its residents. Utrecht is a city of pioneers, a historic city in the centre of the Netherlands and a logistics hub. Utrecht is a smart city, with innovative modes of transport and smart partnerships, for example in the domain of cycling. It is no accident that the Tour de France began in Utrecht in July 2015. Icons of our city are the Dom cathedral and Miffy the rabbit, as well as the bicycle. The Utrecht Science Park and the central station area are Utrecht icons that symbolize a climate-neutral Utrecht and which we can make visible within the city, or more so. Utrecht will become a true 'energetic heart' if its residents remain committed to the theme of energy. And if the know-how within the city is utilized to good effect, for example through annual intellectual crowdsourcing and evaluations involving residents and businesses. The approach will also be owned by Utrecht if the effects are visible in the city. For example, if street lights are visibly running on green electricity, or if local media focus on neighbourhood initiatives.

Our plan contains the following building blocks which we elaborate for each sector below:

FIGURE

4. Current energy use in the city

Each year, a large quantity of energy is consumed by the city, corresponding to 400 million euros in monetary terms. Of all this energy consumed every year, approximately a third is required for 'Living'. The proportion that goes to 'Working' is nearly half. The rest is used for transport. If we look at what the energy is used for, we find that slightly over half goes to heating (district heating and gas), approximately a quarter takes the form of electricity and the rest is used for transport. If we look at CO₂, electricity is the most significant contributor, accounting for nearly half of all CO₂ emissions, with the assumption being that the electricity is still primarily generated using fossil fuels, in line with the national average.

Energy provision in Utrecht is dominated by gas and coal, and the city has a gas-fired power station within its municipal boundaries. The oldest district heating network in the Netherlands is located in Utrecht and is fed by residual heat from the gas-fired power station. A total of 35,000 homes are connected to the network, plus a very large number of buildings such as offices, swimming pools and educational buildings. Eneco is currently investigating the possibility of building a biomass boiler that will deliver heat to the district heating network. There is currently no large-scale sustainable generation in the city itself.

Since 2011, the number of solar panels on roofs in Utrecht has been increasing rapidly. By the end of 2014, an area of approximately 62,000 m² was fitted with solar panels. This represents nearly 2% of the total roof area suitable for solar panels in Utrecht. The panels produced a quantity of electricity comparable with the consumption of nearly 3100 households. That is ten times as much as in 2011. The number of panels is growing faster than in the rest of the Netherlands.

In recent years, the city's total CO₂ emissions for living, working and transport have averaged approximately 1.55 million tonnes per year.

5. Living – our plan

In the future, homes in Utrecht will be energy-neutral, comfortable and affordable. Everyone will use energy-saving devices and lighting. Residents will know their energy consumption (thanks in part to the use of smart meters) and will consciously manage their consumption, for example by comparing it to others'. Residents will be able to choose from different suppliers and make an informed choice between them. In order to make a future like this possible, the following measures are needed.

Heat and insulation

- ✓ Utrecht will start building only energy-neutral new homes as soon as possible.
- ✓ In areas which are (or will be) connected to the district heating network, existing homes will be upgraded at least to energy label B, but preferably beyond.
- ✓ In areas where more than 70% of buildings are or can be connected to the district heating network, natural gas pipelines will not be replaced. The natural gas network will not be expanded further. Conditions for achieving this measure are: the social costs of heat supply will be reduced, maximum environmental benefits will be achieved, and at least two-thirds of those affected will support connection to the district heating network.
- ✓ In areas where no district heating is in place or possible, the minimum target when renovating homes will be energy label A, but preferably energy label A++. This means that ever fewer homes will be heated by natural gas and can therefore be disconnected from the gas supply network. The municipality will be closely involved in the development of this extremely energy-efficient homebuilding, will learn from it and will amend procedures and regulations in order to speed up and facilitate the process.
- ✓ The municipality will encourage efforts to make historic buildings energy-neutral without loss of their cultural and historical value. The municipality will play an active role in this regard.
- ✓ Many residents still lack knowledge about the hows and whys of home insulation. A municipal energy coach or an energy service desk could help in this regard. Additionally, the benefits of extremely low-energy houses and the successes achieved with renovation in Utrecht need to be widely shared.
- ✓ The municipality will investigate the need and potential for adapting or adding to the existing range of financial instruments available to residents and housing corporations, preferably in partnership with mortgage lenders, banks, pension funds and insurers. It will investigate whether loans can be linked to the homes (rented or owner-occupied), not to the residents. This would mean that a loan would be transferable when a home is sold.
- ✓ Sustainability funds and loans are needed to help fund the significant investments required and to spur private home owners to renovate their homes.
- ✓ The municipality will investigate the possibility of imposing a higher property tax to enable the funding of sustainability measures at attractive levels. Two possible ways are proposed: a loan tied to the house which is paid off through the mechanism of the property tax or setting up a fund financed by an increase in the tax.

Solar panels on buildings

- ✓ Utrecht will fit solar panels to all suitable roofs in the city. This will be encouraged by joint purchasing initiatives, with the municipality playing a pro-active role. Similar joint initiatives will also be launched for energy-saving measures, such as insulation measures and devices.
- ✓ Tenants will be given the opportunity to purchase solar panels themselves and set off the proceeds against the service or rental costs. The possibility of renting out some roofs to energy companies or cooperatives will be investigated.
- ✓ All new buildings will have solar panels and they will be integrated into the designs as far as possible.

Energy-saving equipment

Electrical equipment accounts for a significant proportion of home energy consumption. In order for Utrecht to become climate-neutral, that consumption needs to come down.

- ✓ The amount of energy consumed by a device must be visible when it is purchased and – if possible – during use. This can be done by providing better information about the costs/savings over the entire life of a device, for example on the packaging.
- ✓ The municipality will help establish joint purchasing initiatives for energy-efficient devices, as with solar panels and home insulation.
- ✓ When new housing developments are built, homeowners will only be offered the most energy-efficient category of built-in equipment.
- ✓ Those on low incomes will receive assistance with the purchase of energy-saving equipment (particularly lighting, washing machines and fridges). The municipality will play a pro-active role.
- ✓ Residents will be given a better picture of their energy consumption, for example by the hire of energy meters for devices, smart meters for electricity, gas and heat, the provision of information on energy consumption by a home or household compared to similar homes and households.
- ✓ Word-of-mouth advertising and social media will be utilized to increase the energy-awareness of Utrecht residents. It can be helpful to compare one's own energy consumption or that of the neighbourhood with those of others.
- ✓ The municipality will have frequent contact with its residents, by means of the municipal service desk or letters and e-mail. Through these channels, it can provide regular or standard information about opportunities for energy saving.

6. Working – our plan

By 'working' we mean the energy consumption of all other buildings: for example, offices, industrial premises, shops, schools and hospitals. In principle, the same package of measures applies to this sector as to 'living'. LED lighting and energy-saving equipment will be fitted throughout. Offices, food service businesses and stores selling fresh produce will make use of soil energy (heat and cold storage), so reducing their energy consumption.

Because energy prices (including taxes) for this sector are lower than for households, the investment costs of some energy-saving measures will only pay for themselves over a longer period or not at all. Another difference is that our plan envisages more compulsory measures for owners of 'working' buildings than for residents.

- ✓ Businesses with an energy consumption of at least 50,000 kWh of electricity or 25,000 m³ of natural gas must take all energy-saving measures that will pay for themselves within five years. The municipality will enforce this requirement even more strictly and help firms to find solutions.
- ✓ Tenants of commercial buildings will be asked to put part of the proceeds from energy savings into co-financing the measures, working closely with banks.
- ✓ The owners of the buildings and the tenants will invest in measures jointly. They will make agreements about sharing the investments and the proceeds. In doing so, they will consider both the increased value of the building (owner) and the impact on productivity (tenant).
- ✓ The energy labels of public or other buildings will always be visible, starting with all municipal buildings.
- ✓ The municipality will investigate the possibility of imposing higher taxes on companies that waste energy.
- ✓ The municipality will investigate how it can best stimulate a change in behaviour among businesses – for example by using quality marks and comparing energy consumption among different firms and/or using coaches. The municipality can also put companies in touch with one another, enabling collective purchasing of equipment or joint implementation of energy-saving measures, which can also save on costs.
- ✓ The municipality will push to improve national policy on investments in solar panels in the 'working' sector – for example, by modifying the structure of energy prices or investigating opportunities for returning energy to the grid (at the full electricity price).
- ✓ The municipality will ask companies and organizations to support its objective by themselves actively identifying energy-saving measures in their buildings, in consultation with the owner or manager of the building. In order to facilitate this, the municipality will support the establishment of energy teams or 'business conversations'.

7. Transport – our plan

In the future, we will make the greatest possible use of public transport and bicycles in Utrecht. If we need a car, we will drive in an environmentally-conscious manner, using energy-efficient and clean cars. In the longer term, all cars and buses will run on electricity. Trucks will run on electricity or biofuels.

Electric buses and goods transport

- ✓ All buses in Utrecht will ultimately be required to run on electricity. It is important that they should be at least as safe as they are now. The municipality must include emissions requirements in conditions for public transport. It must also investigate where it can improve the infrastructure for public transport and for cyclists.
- ✓ A study will be carried out to establish whether public transport can be made cheaper, or in any event maintained at the current price level, even as it goes electric.
- ✓ There will be an increased focus on research into better technologies to enable biofuels for trucks. In the long term, trucks will run on biofuels: only residual waste or sustainable raw materials will be used (not food).
- ✓ The burning of biofuels must not cause any additional air pollution (or smell, for example).

Energy-efficient cars and economical driving

- ✓ Energy labels will be clearly displayed on cars, resulting in Utrecht residents taking more account of energy-efficiency when buying a new car. Only cars in the same class will be compared with one another.
- ✓ Utrecht will run campaigns promoting 'the New Way of Driving' in order to encourage more economical driving. These campaigns will become part of a multi-year transport programme and will be ongoing.

Electric cars

- ✓ Throughout the city, there will be sufficient charging points for electric cars. The municipality will investigate the possibility of moving towards a city centre in which only electric cars are allowed in several phases. (This will not apply to tourists). Such a step will be dependent on the development of the technology (for example, the capacity and charging time of batteries) and the required fall in costs. Electric transportation must also be safe.
- ✓ All charging points will supply only green energy. To this end, contracts will be concluded with suppliers of 100% green electricity. The charging points will ideally make use of energy generated locally, in the neighbourhood or district.
- ✓ Residents and businesses will also use electricity stored in the batteries of electric cars for purposes other than transportation. In this way, optimum use will be made of sustainable energy.
- ✓ Electric cars and shared cars will be able to park for free or at reduced cost in parking spaces reserved for the purpose. Transport providers will be encouraged to switch to electric transport.

8. Central energy provision in Utrecht

– our plan

Infrastructure

The energy-saving measures under living, working and transport have consequences for the design and cost of the energy network for natural gas, heat and electricity in Utrecht. Natural gas will play an ever smaller role, electricity an ever bigger one (through electric cars, heat pumps for A++ homes). In order to limit the cost to the city as a whole, an optimum match between supply and demand is very important.

District heating

Utrecht has the oldest district heating network in the Netherlands. Private homes, rented homes and businesses and institutions are all connected to the district heating network. District heating is provided by a single provider, with the price being regulated by the government. This means users cannot choose between providers. This is one of the reasons why customers do not always have positive views on district heating.

- ✓ The CO₂ emissions of the existing district heating network will be reduced further. This will be achieved by generating heat using sustainable energy sources such as biomass and soil energy, e.g. geothermal energy.
- ✓ Together with the national government, the municipality will stimulate and investigate the possibility of multiple providers supplying heat, a so-called district heating network. In this way, customers will gain the option of selecting their provider on price and service level.
- ✓ The municipality will investigate whether other forms of heat pricing and/or participation of those involved will positively influence support for district heating. The current method of calculating prices (with the standing charge accounting for a large proportion and usage only a small proportion) barely offers customers any scope to influence the size of their energy bills.
- ✓ The municipality will request permission to experiment regarding an actual trial with multiple providers or another way of setting rates.
- ✓ Each heat provider will state the source of the heat and the quantity of CO₂ emissions released in production.
- ✓ The possibility of also connecting other sources in the long term, such as heat from burning biomass, deep geothermal energy, or solar energy, will be investigated.
- ✓ Gas pipes will no longer be replaced in areas where nearly everyone is connected to district heating (see under 'Heat and insulation'). Residents/parties will then be obliged to select optimum insulation or district heating. Residents will be offered incentives to switch – for example, the residual value of their old central heating boilers could be reimbursed.
- ✓ The municipality will play an active role in reaching agreements with the energy company about prices and forms of heat generation, for example. This will require new scope for experimentation within the law.

Solar farms

Solar panels are also suitable for locations other than roofs. There is potential for installing them in acoustic screens, above motorways, on industrial or business sites or on solar farms in open areas, as long as they are not areas of outstanding natural beauty.

- ✓ The municipality will facilitate the development of solar farms, for example by making permits available quickly and by modifying land use plans where necessary.
- ✓ The municipality will continue to investigate which areas of land can be used to generate solar electricity.
- ✓ The municipality will reinvest any proceeds from the rental of municipal land for solar farms into energy-saving measures or clean energy.
- ✓ The municipality will ensure that solar panels are integrated into the landscape in an aesthetically pleasing manner. In doing so, it will take advantage of opportunities to use the solar farms for education/raising awareness – for example solar farms shaped like a maze or with touristic value.
- ✓ The municipality will push to improve the national policy for joint/individual investments in solar farms. The municipality will look into ways of reducing the threshold for such investments.

Wind energy

Under the heading of wind energy, we discussed small wind turbines on roofs and large-scale turbines generating up to several megawatts (MW).

- ✓ Utrecht needs to do more to stimulate small-scale wind turbines on roofs of businesses and homes.
- ✓ Opinions on large-scale wind energy diverge and this is an emotional subject. Initiatives need to be weighed up carefully.
- ✓ This means situating wind turbines at a sufficient distance from residential neighbourhoods, along motorways, along canals, or on industrial estates. What counts as 'a sufficient distance' differs from one situation to the next. For this reason, local residents must be properly involved at the start of the process and given a say.
- ✓ Where studies reveal that nuisance may be caused by the noise or the shadow cast by wind turbines, additional modifications will be made to limit or prevent this nuisance as far as possible. A principle which might be employed is that a wind turbine project should actually reduce noise nuisance – for example by simultaneously taking measures to reduce the noise nuisance from other sources (motorways or industrial sites).
- ✓ From the outset, the municipality, initiators and local residents will work together. Those affected can give their own input, in order to broaden support. They will also be given the opportunity to share in the proceeds from the wind turbines.
- ✓ The municipality will ensure that all projects are appropriately integrated into the landscape, for example through the design (size, colour, patterns) of the wind turbines or by placing several turbines together in a line.

Biomass power stations

Biomass power stations can supply electricity or a combination of electricity and heat. When deciding whether to build a biomass power station, it is particularly important to consider where the fuel it uses will come from.

- ✓ The power stations will only make use of sustainable and responsibly sourced wood, preferably local pruning wood and fruit, vegetable & garden waste.
- ✓ The possibility of capturing the CO₂ emissions by a pipe and, for example, disposing of them by ship will be investigated.
- ✓ It will be clear from the outset that the power stations do not cause air pollution or odour nuisance. Clear information will be available to Utrecht residents about permits and the supply of raw materials, for example.
- ✓ The heat generated by the power stations will partly be used to make district heating greener.
- ✓ The municipality will investigate whether it can use fruit, vegetable, and garden waste from the city, for example to make district heating greener or for other forms of green energy generation.

Deep geothermal energy

Deep geothermal energy is a possible future option for the city. If it turns out that extractable heat is present at great depths, the municipality will have a role in finding a suitable location for the installation.

- ✓ The municipality will investigate where there are opportunities for geothermal energy in the city.
- ✓ In terms of safety, the risk of earth tremors and the prevention of contamination to ground water must take priority.
- ✓ The technology needs to be developed further, for instance to improve yield. The impact of projects on the environment needs to be catalogued properly, in a way that inspires confidence.
- ✓ In the realm of geothermal energy, the municipality will push for joint Dutch (or European) policy and partnerships. This is needed in order to share the large financial risks and develop the technology further.

9. Principles for the energy plan

Information, education, awareness and behaviour

The potential exists for Utrecht's businesses, civil society organizations, and residents to make smarter use of energy for living, working and transport. This calls for good information, awareness and ultimately a change in behaviour. Residents and firms need to make different choices when they buy electrical equipment in particular. Residents need to give more thought to energy-saving behaviour at home and at work. This will also help to increase the acceptance of some measures. A central, independent information point focused on specific target groups could help to increase awareness. The municipality can play a role in boosting awareness by improving information provision, as described under various elements of our plan.

Different roles and involvement

The municipality has a major, pro-active role to play in the switch to sustainable energy. Many of the measures described will be initiated by the municipality. It also has a clear role to play in modelling behaviour and needs to make the measures taken visible. It can do so by, for example, installing solar panels on all municipal buildings, such as schools. The municipality could also be more active in providing information: through its service desk, by means of an energy newspaper or on the website. It could also provide permanent support for residents' initiatives, for example the energy ambassadors. In the longer term, it is possible that the municipality will become an energy supplier, with residents as shareholders. The university and other institutes will supply all the required expertise and will begin by making their own buildings sustainable.

10. The effects of our plan

With regard to some measures (such as deep geothermal energy or other future innovations) it is uncertain whether they will become available before 2030.

- ✓ The measures which are already available can, if put to full use, together reduce CO₂ emissions by up to 90%. Calculated using current prices, the investments that will need to be made in Utrecht to achieve this stand at between 7 and 10 billion euros.
- ✓ Depending on the extent of insulation, each home will require an investment of approximately 15,000 to 35,000 euros. This is set against a saving of between 2,000 and 2,500 euros per year on energy bills.
- ✓ Over the coming decades, a total of between 40,000 and 90,000 fte's will be created, particularly at construction and installation firms.
- ✓ Insulating buildings will significantly enhance comfort at home and at work.
- ✓ In addition, electric transport will make Utrecht a good deal cleaner and healthier, as will district heating and heat pumps.
- ✓ The installation of solar panels on roofs will increase the value of the buildings in question.

11. Finally...

Finally, we would like to communicate the following to all Utrecht residents and local politicians: the three city-wide conversations were special. They prompted many of us to start thinking differently about energy, and about the difficult choices we will sometimes have to make in consequence. Where energy was a 'thing', it got emotional. We see how important it is to work together and to be committed. But we also see that energy and climate measures offer new opportunities. Utrecht will become cleaner, more sustainable, greener and more prosperous if we start investing now.

This process has also made us impatient. We want to see the implementation of this energy plan starting soon. We would like to already be climate neutral by 2020. Utrecht is home to Utrecht University, Utrecht University of Applied Sciences and many other research institutes and companies. They could help us further elaborate and implement this plan, perhaps focusing on a number of example locations or projects – such as the Utrecht Science Park, the city centre and older homes owned by housing corporations. Let's start making meters and put the motto of this energy plan into practice together. Utrecht: energetic heart of the country.

12. Acknowledgements

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165 Utrecht residents

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- 911 cups of tea
- 721 bottles of soft drinks
- 1,789 sandwiches
- 630 sheets of paper on 25 flip charts on seven walls
- 17,000,000 dreams

And of course anyone we accidentally failed to mention!

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