

# SETMATCH

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Interview with Rob Roggema

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Floriade 2022



Norway's goal for CCS  
**Green Solution or Green Delusion?**

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# Floriade 2022

## An event of tomorrow, today!

### Thanasis Vasileiadis – Sakatias

Despite the fact that it is not widely known to the public, the Floriade Expo event is a Dutch, world-famous greenery event which will take place in Almere, in the province of Flevoland. It is the seventh edition of this kind of project and it will open its doors to the public in 2022, with the theme 'Growing Green Cities'.

The organizers of the event are creating an exhibi-

tion spanning the entire 60 hectare site for a period of six months. This site will have a wide variety of trees, plants and crops with which the visitor will have the chance to interact and learn more about. However, their vision goes beyond this, as they also want to create a new green, sustainable neighbourhood, comprised of hundreds of homes and apartments that will remain after event has ended.



*Left: Present state of site, Right: Site during Floriade*



*Gardens inside the Floriade*

## Green Explosion

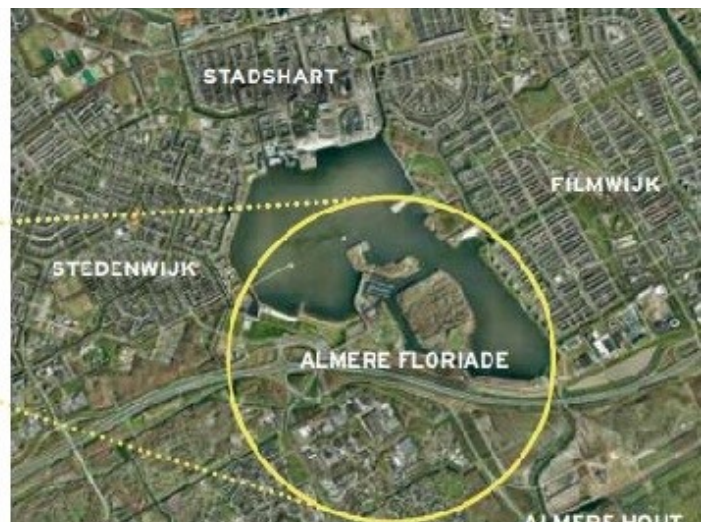
The entire area will be initially developed as a mosaic of gardens full with colour, smells and even taste, all of which will blend with each other effortlessly. The different sites of the event will be dedicated to a variety of plants, from hedgerow and grass, to flowers, fruit trees, greenhouses, water plants, and even a pine forest. However, each item will have a demonstrable use in the greater scheme of a green city. For example, some will be used to lower the city's temperature, others to store water, cleanse the air or even create energy.



## Sustainable neighbourhood

Despite the focus on the expo event, the project will also serve a greater purpose. That is to develop and materialize one of the first of its size green neighbourhoods. From small and large houses, to offices, hotels and even skyscrapers, the Floriade will have it all! The different buildings will be meticulously designed to seamlessly blend into the surrounding environment, minimizing

their impact on the latter. At the same time, they will need to follow the highest energy standards with renewable energy technologies playing a major role. Finding the optimal solution to covering the needs of such a large-scale and diverse project will pose a great challenge, one that will put to the test even the most ambitious of engineers.



*Location of Almere and the Floriade site*

## Floriade in numbers

The positioning of the site is instrumental to the popularity of the event. It is located in the centre of the Netherlands, accessible from Amsterdam in 25 minutes by car or from Schiphol airport in 30 minutes by train. Thus, during the entire duration of the expo, from 28 April to 23 October 2022, the Floriade is expected to host more than 2 million visitors, half of whom are predicted to be from abroad. Additionally, 125,000 business visitors are anticipated, excluding numerous conferences.



*Visual representation of the Floriade site*

## Bottom line

The Floriade event aspires to be an example of sustainability and innovation, a model of how our future cities will look like. Whether its organizers will be successful in their venture remains to be seen. One thing is certain though. More light needs to be shed on such ambitious and sustainable projects!

# Interview with Rob Roggema

Megan Atkins & Bertram Peterson

This October, we had the pleasure to interview Rob Roggema, professor of Sustainable Urban Environments at the University of Technology Sydney's School of Architecture. Realistic and optimistic at the same time, Rob exemplifies the importance of having more academics and researchers involved in policy making.

During our conversation, we discussed climate adaptation and how this problem needs to be thought of in terms of the potential of opening up new perspectives of how cities should be planned, designed, and lived in. For instance, instead of following the fixed, rigid path set by an electrical grid, Rob's vision for a city is that it should grow according to the potentials within new areas for urbanization and development (e.g., wind and solar availability, access to fresh water sources). The grid should adapt to those potentials, accordingly.



Currently, Australia lacks climate leadership at a federal level: they effectively abandoned their commitments to the Paris Agreement, are embracing low coal prices, and have slowed down on development for wind and solar. He reiterated one of the reasons we haven't been able to make as much progress as we could is that we as a society don't think long term, but rather in the usual 4-to-6-year political terms.

"if 25% of all roofs

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However, Rob is confident progress will be made through state and municipal leadership. Sydney, for instance, has a green council independent from the government and a goal of being zero-carbon by 2040. Its mayor supports sustainable projects through and through. He's wise to do so, says Rob, considering the potentials are astounding. According to his estimate, if 25% of all roofs in Sydney were covered with PV, they would generate enough electricity for the whole city (storage wasn't brought up during the discussion).

Our conversation ended on a note of optimism regarding an already-lost battle against climate change; the Great Barrier Reef.

The bad news is that, as scientists have warned time and time again, the reef is beyond saving. The bright side, however, is that rising sea will create the right conditions for a new reef further south, right next to Sydney harbour. That is something the Sydney government is determined to help nurture.

The first phase of the plan is to sink several oil rigs and boats to help new reefs grow on. That way, fish will migrate down from the old reef to these new ones. "The first tropical fish was seen in Manly Beach a couple of months ago", Rob said with the enthusiasm you'd see on an architect whose

blueprints just got approved. "That could provide several benefits to the Sydney region, while providing a new home for these species. For instance, the new reef could be seen as a tourist attraction, while at the same time serve as a barrier to prevent storm surges." Mutualistic symbiosis, an ecologist would say.

This is the kind of mindset we need if we want to have a chance at solving the climate issue. Acknowledging of the challenges we are confronted with, yet confident human ingenuity and grit will solve them.



# So, is it time for a German coalexit?

Carlotta Ferri

We are in North Rhine–Westphalia, western Germany, and here we see the ancient Hambach Forest. These trees may be older than 300 years and used to cover 4000 hectares between Cologne and Aachen. However, since 1978 the trees have been knocked down to free up space for a huge coal mining site, and now of this forest only 200 hectares remain. As the legitimate owner of the area, RWE–power announced that in the end of summer 2018 it was planning to continue the forest clearing to enlarge the mining site.

Since this raised many political discussions and protests, the minister president Amin Laschet, of the CDU party (ruling party in the region) expressed his opinion as such. “I am not of the idea that RWE should clear the forest before December, when the Commission for Coal (Kohlekommission) will give its outcome about coalexit or not for Germany.” For those who have not yet heard about it, the coal commission was established by the fourth Merkel Cabinet in June 2018 to evaluate the necessity of coal for energy generation, according with the climate objective to reduce CO2 emissions before 2020. This has not been reached in 2018 yet and the question is if the coal that RWE wants to extract from the Hambach Forest is indispensable.



RWE head Rolf Martin Schmitz claims, “We are trying to explain to the coal commission that a red-light for the continuing of the forest clearing that was planned for October 2018 will put in great risk the electricity generation of the coal power plants Niederaußem and Neurath [respectively 3,400 MW, the second-largest in Germany, and 2,200 MW net capacity]. From our sources this will reduce the electricity generation by 9 – 13 TWh between 2019 and 2021.

This is why we wrote in an open letter to the federal government that a coalexit would be premature for the North Rhine–Westphalia.” Theoretically, RWE already received permission in March by the District Council of Arnsberg to clear the forest starting in October 2018.

However, the Federal State Government has authority on the District Council and claims that if the government’s coal plan had changed with the work of the commission, the necessity of providing more coal from the mining site would have to be reviewed. This debate did not remain a solely administrative discussion. An environmental activist, who preferred to maintain anonymity, tells more about what happened recently in the forest.





“The protest against the forest destruction has begun already in January 2018 with an intrusion into the mining area, and in August we were already occupying the forest with camps and tree houses. Since the settlements were claimed as illegitimate on a private area [RWE actually bought the forest], the police began to remove everything. In September a massive police action destroyed all our tree houses in the forest claiming that it was for security reasons and fire protection. There were around 70 tree houses in the forest, aggregated in three villages: ‘Northen’, ‘Oaktown’ and ‘Gallien’. We were together with some representatives of the Catholic Church and we sat on the ground to protest against

the destruction of the Hambach forest. The policemen had to lift us up and carry us out with their own arms. We suffered one dead and many injuries in these police actions.”

In October the deforestation permission for RWE was eventually retired by the Higher Administrative Court of North Rhine– Westphalia. Rolf Martin Schmitz explains the reason. “Apparently we did not submit the necessary documentation to prove that the clearance of the forest is actually necessary for the electricity supply of the region.” In fact, this kind of declaration is needed to operate in a natural area in which at least 2 animal species are in risk of extinction and more than 140 are protected species.



He explains how long the permission has been retired. “The work is completely blocked until the court decides if the Hambach Forest is a natural protection area or not and this should take until 2020.” An environmental activist tells about the last updates from the protest. “The last demonstration was on the 6th of October with 50,000 participants from ‘Naturfreunde Deutschlands’ (friends of nature of Germany), Greenpeace and ‘BUND’ (Federal Ministry for Natural Protection) and many others [The police reported numbers between 20,000 and 30,000].”

But what do Germans actually think about this debate? From a survey in North Rhine– Westphalia 79% of the population is against the clearing of the forest, while 18% supports it. With these numbers the question has moved to the Parliament, which on the 10th of October discussed the topic of the Hambach deforestation and the coalexit of the region. What will be the next move of the government? The parties are divided. There those who talk about an immature energy market for a complete transition and worry about the jobs at RWE. On the other hand, it is clear that the climate objectives for 2020 have to be met and that the government should not be an obstacle to the energy revolution. The question arises: what are the limits of the efforts for an energy transition in Germany? Who is it more worth sacrificing? In the end, the coal commission will have the final word on the Hambach forest in December 2018.



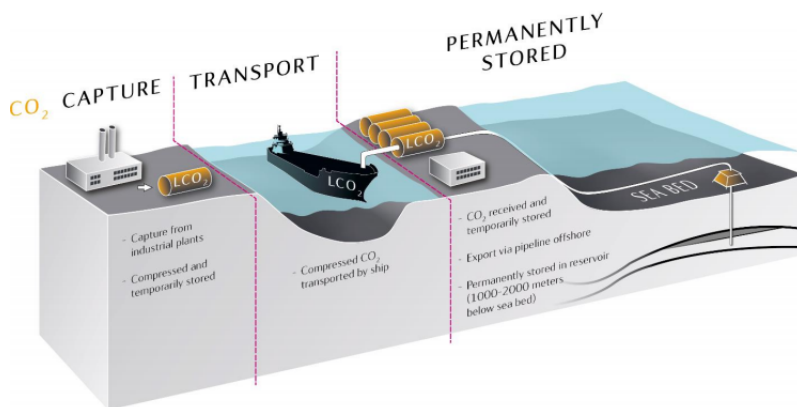
# Norway's ambitious plans for CCS

## Green solution or green delusion?

Andrew Keys

With approximately 97% of Norway's electricity coming from hydropower, Norway produces the highest share of renewable electricity in Europe. However, with more frequent extreme weather conditions, Norway's vision of becoming Europe's 'green battery' is becoming more obsolete. The latest idea by the government is to further capitalise on their natural gas reserves, of which they are already the third-largest exporter of in the world, to both supply energy to the rest of Europe but also to 'clean up' after others using carbon capture and sequestration (CCS).

After previously putting the idea to bed, the government have reignited the scheme. It plans to begin with a full-scale demonstration project entitled "Northern Lights" to explore the feasibility of capture, transport and storage of greenhouse gases. Equinor's (formerly Statoil) sales director Martin Anfinnsen commented "we could absorb all Europe's CO<sub>2</sub> emissions for hundreds of years. The storage possibilities off our coast are virtually unlimited." Logistically it is proposed that the CO<sub>2</sub> will be primarily shipped from neighbouring countries, reducing the need for additional gas pipelines.



They would of course charge a fee for countries to store their carbon emissions and with some amount of gas reservoir infrastructure already in place from extraction projects, Norway appears to have created an impenetrable business plan alongside providing a 'soft' global solution to climate change.

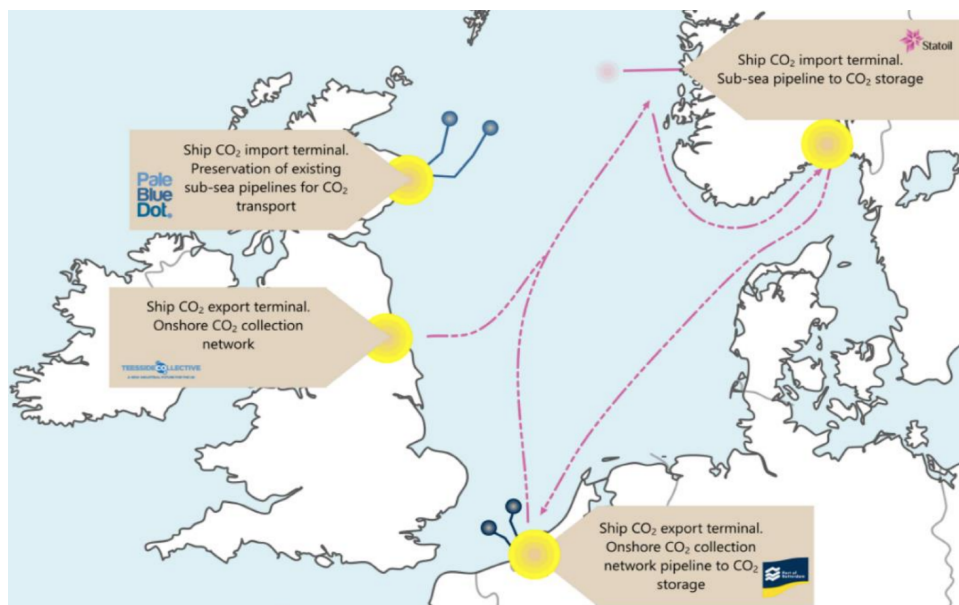
*Left: The value chain of Norway's CCS plans*

*[source: Euractiv].*

However, Norwegian officials have sidestepped a key aspect of their business plan. With the imported carbon emissions, they plan to push gas extraction limits further through a process known as Enhanced Oil Recovery (EOR). The principle of EOR involves injecting carbon dioxide into oil and gas formations to re-pressurise and displace more of the respective resource without the need for additional infrastructure. Norway may portray this project as the perfect solution to our environmental crisis, but ultimately it has all intentions to capitalise on it to extract even more fossil fuels, all paid by its neighbouring countries.



*The Sleipner. A project that injects carbon dioxide into saltwater aquifers deep beneath the sea floor off the Norwegian coast [source: Stanford University].*



*Overview of four projects of common interest that may receive EU support for CO2 transport [source: Bellona Europe]*

Norway is currently requesting funding from the EU and already has the support of Germany, who see it as a necessary tool to help achieve decarbonization in their large and complex industrial sector in order to meet their climate change goals. The latest report by the IPCC further backs the necessity of CCS, but let's just hope that this happens in a principled manner.

Once the infrastructure and shipping routes are established to Norway then it is likely that they will want to continue this operation for as long as possible even if it is at the expense of prolonging the burning of fossil fuels.

Taking a step back, the project should not be demonized; it is an essential solution to eradicate many current emission sources that energy efficiency and renewable energy cannot currently achieve alone.



# The Dutch Gas Show

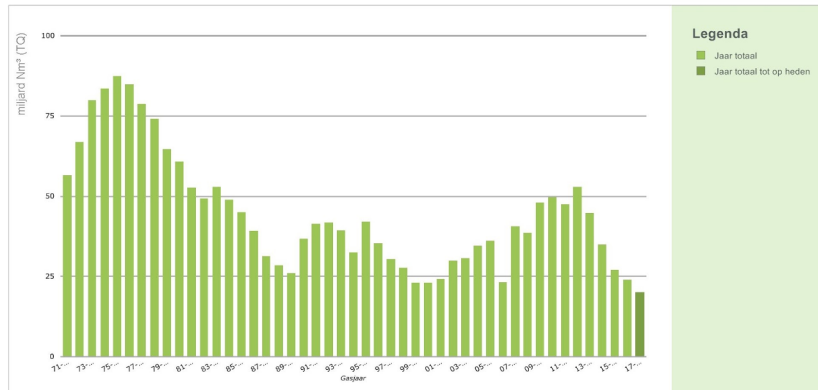
## Casper Eijkens

The gigantic gas field near Slochteren in the province of Groningen has yielded the Netherlands both wealth and headaches. The economic benefits and energy stability of natural gas caused the state to go through an unprecedented energy transition, providing over 95% of Dutch households with a connection to the gas grid. Since the sixties, revenue from natural gas has led to great economic prosperity, shaping the country to be as it is today. However, slurping up the gassy goods caused degradation of the soil, bringing about minor but increasingly frequent earthquakes in the province of Groningen.



### Totaal uit Groningen-gasveld gewonnen gas

Van gasjaar 1971-72 t/m gasjaar 2017-18



In early 2018, the grumble from Groningen was finally taken seriously: “Kraan dicht!” Now, the state appears to have painted itself into a corner and now all eyes are on minister Wiebes, who is responsible for solving the gas crisis.

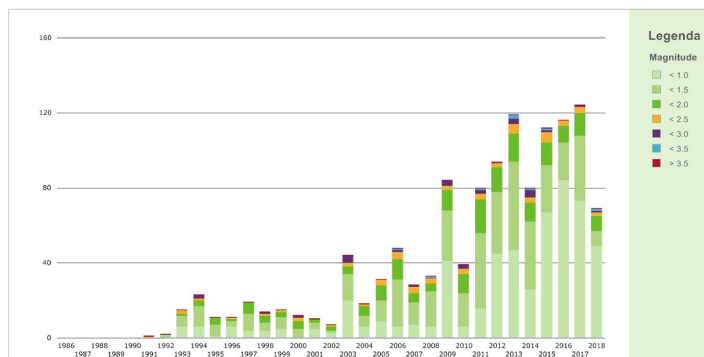
In 1962, the Dutch state agreed to a 50% partnership with the Dutch oil and gas company de Nederlandse Aardolie Maatschappij (NAM) to produce natural gas from the field near Slochteren. Since then, this joint venture has yielded the Dutch state treasury about 270 billion euros. At the end of the seventies, during the peak in gas production, about 15% of the state’s total annual budget was funded by natural gas income.

Then, in 1986, something odd happened. An aardbeving hit the otherwise seismologically stable city of Assen. The locals blamed the mining industry, but their allegations were met with sardonic laughter from the Hague and the NAM. How could human behaviour ever cause a natural disaster? The earthquakes have since appeared repeatedly, causing the inhabitants of Groningen to grow more frustrated over the years: since that first earthquake, Groningen has stayed the cash cow of the state but has had to suffer the consequences alone. The tremors caused cracks in houses, sharply devaluing their market value and demanding expensive repairs.



### Aantal aardbevingen in het Groningen-gasveld

Van 1986 tot 2018



The year 2018 marks a turning point in the Dutch gas history. An earthquake scoring 3.6 on the Richter scale hit the village Huizinge in Groningen, causing over a billion euros in residential damages. The Groningers finally received the country’s sympathy and, motivated by the solidarity, demanded louder than ever to stop all mining activities. Eric Wiebes, current minister of economic affairs and climate policy, reacted and drew up a plan to halve the current gas production of 24 billion cubic metres by 2022.

Among other things, he drew up a menacing letter in which he ordered the 170 largest Dutch consumers to completely stop using gas within the next 4 years. It is however completely unclear which alternatives are available and who is going to pay the bill. If you like drama, I have something truly salient for y’all: the Dutch energy politics are going to be a one heck of a show.

# California 100%

## Milestone bill pledges California to 100% Clean Energy

Megan Atkins

You can read the words again and again and still you can't quite believe that this is really happening. In the US of all places. Yet, California has just written itself into history as the frontrunner to a carbon-free future.

As of 10th September, California governor Jerry Brown signed the final piece of legislature to make SB100 law. The bill aims to make electricity in California 100% carbon free by 2045. This pledge is a significant step to make in today's political climate, and one that much of the world was desperate to see.



### Is it really possible?

Climate change policy is notoriously dividing and constantly trying wade to through a sea of endless criticism. That is what is so unique about this bill: its flexibility. Its ability to appeal most parties concerned even in today's political climate.

The bill has three main goals:

- To be 50% renewable by 2026
- To be 60% renewable by 2030
- To have 100% carbon-free energy by 2045

To your average customer, this may seem like an ambitious challenge. But if you take a look at what has been passed through the California senate in the past, it's pretty realistic.

As of 2017, 29% of electricity in California comes from renewable sources, 9% from nuclear and 12% from hydro power. The SP350 already introduced a carbon reduction goal in California in 2016. Combining these two together, the California government is actually on track to hit 60% renewable with time to spare.



It's that third point that is so crucial here. 'Renewable energy sources' constitutes solar and wind power. The fact that California has pledged to be 'carbon free' expands that horizon to encompass things like hydropower, biomass, nuclear and even carbon capture and storage (CCS) as viable options.



For many, this makes this goal much more achievable. To rely solely on wind and solar would result in a highly variable energy supply. Adding these other sources into the mix allows for much more stability, ensuring that even with sudden surges in demand or unpredictable weather electricity supply is still constant.

Many studies have shown that a mixture of low-carbon resources is both less risky and more

cost effective in decarbonizing electricity. In other words, framing the bill in this manner significantly increases its chances of success.

The words 'carbon-free' also encompass any future technological developments. This bill has been strategically worded to avoid locking out new technologies that haven't been invented yet. Storage, for example, could be a vital part of California's future, carbon-free energy grid.

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## What challenges are there?

Despite this intrinsic flexibility, those that do dispute SP100 believe that even with the additional 'zero-carbon' goal, a 100% scenario will still be too unreliable to manage effectively. In addition, it will leave stranded assets or simply be too costly to implement.

All of these are concerns at the moment. "The amount of transmission investment that would be required would be incredibly expensive," said Wade Schauer, research director for Americas Power & Renewables Research at Wood Mackenzie. "... the design of energy markets will need to be reinvented if all of the resources have variable costs of \$0 per MWh."

California has also committed to eliminating nuclear power, replacing it with clean energy generation. This involves additional work and investments in zero-carbon energy sources to replace this one.

And on top of all this, the California energy utilities are going to have to look hard at the decarbonisation of other sectors at the same time as electricity.

Take transportation for example. Currently it accounts for around 40% of California's greenhouse gas emissions. However, the introduction of electric vehicles will change drastically. Utility companies will need to take into account the increased electricity load that comes with this.



If they get it right though, the new reliance of the transportation sector (as well as others) on electricity could lead to the decarbonisation of many sectors in parallel. It's the first step on the path to an entirely carbon neutral state, all starting with this one bill.

So, yes there are some challenges, but there are also hundreds of other reasons to be excited about this. The symbolism behind the 100% clean energy is huge. California has now set this target for others to follow. And others are sure to follow.

This time next year, we might already be seeing numerous other US states or cities announcing their desire to follow California's lead, in addition to those that have already committed. If the 5th largest economy in the world can go carbon free, then surely anyone can do it.

# Trump vs the Environment

Yitzi Snow

Donald Trump is the president of the United States of America. When it comes to the environment, this will have serious consequences, and there are two important questions to be answered: What is Trump doing? And what happens next?



Follow

The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.

11:15 AM - 6 Nov 2012

100,688 Retweets 66,068 Likes



13K 101K 66K

To answer the first question, it is important to understand the role of as US president. Donald Trump has the ability to appoint leaders for federal agencies like the Department of Energy (DoE) and the Environmental Protection Agency (EPA). His choices have been extremely concerning from an environmental standpoint, to say the least. The Secretary of Energy still denies the basic science of climate change, while the head of the EPA is a former lobbyist for the coal industry.

*A real tweet from the current president of the United States of America*

Donald Trump, with his appointees, can decide the priorities and actions of these agencies. This has led to plans to subsidize coal power plants, or to stop increasing vehicle fuel efficiency standards. These plans may not come about – the plan to subsidize coal has already been rejected by the courts. Still, there have been many successful efforts, including the elimination of many environmental regulations and the increase in offshore oil drilling. Even if some of the rules are eventually reversed, a great deal of damage will already have been done. In order to prevent the worst effects of climate change, serious action must be taken immediately.

## This brings us to the next question: What happens next?

Famously, Donald Trump has decided to pull the United States out of the Paris Climate agreement. This represents a clear opposition to sustainability and renewable energy. Technically, the US is still a member of the agreement, since they are not allowed to officially announce a plan to withdraw until November 2019. Since this process takes one year, the earliest date that the US could actually exit is November 4th, 2020 – one day after the next presidential election.

Practically, however, the Paris agreement has few binding requirements in the near future. Without a political will to reduce emissions, the agreement cannot have a serious impact, and in the US federal government there is a strong opposition to action on climate change.

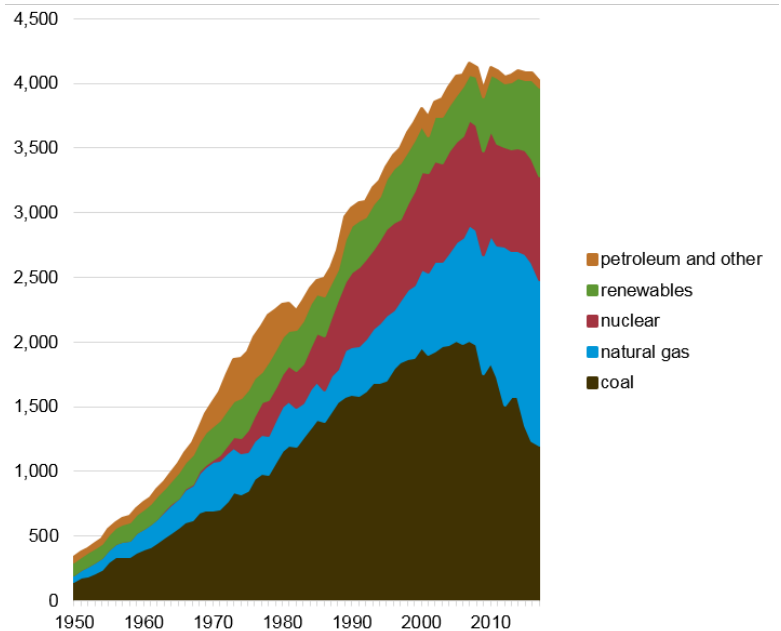


There is still some good news. Whether or not the US remains part of the Paris agreement, greenhouse gas emissions are still dropping. Due to a factors such as the low cost of renewable energy and the replacement of coal with natural gas, the US is reducing its greenhouse gas emissions substantially. Make no mistake, the US is still one of the biggest emitters on earth, and is nowhere close to reaching emissions levels that are required to prevent catastrophic climate change. Still, if the US continues to use more solar, wind, and gas power, it may continue to see steady improvements, despite Donald Trump's best efforts.

Although the United States may not be committed to environmental measures on a national level, surveys show that more than 60% of Americans still want the government to do more to protect the environment. Seventeen states and territories, led by governors from both major parties, have already joined the U.S. Climate Alliance, a coalition committed to reducing

carbon emissions and advancing the goals of the Paris agreement. These states and territories include 40% of the United States population, and they will continue fighting climate change while working to prevent the Trump administration from causing more damage. See, for example, California's goal of becoming 100% carbon free, discussed elsewhere in this issue. And we can expect more action by the states in the future. In elections on November 6th, Americans in four states (Michigan, Wisconsin, New Mexico, and Illinois) elected a governor has who promised to join the Climate Alliance when they take office. More elected officials have pledged to tackle climate change and support renewables.

U.S. electricity generation by major energy source, 1950–2017  
billion kilowatthours



Note: Electricity generation from utility-scale facilities.

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 7.2a, March 2018, preliminary data for 2017



Coal production has been decreasing since 2005, and shows no sign of recovering



Block Island Wind Farm, the first offshore wind farm in the United States

## Conclusion

Donald Trump and his administration are working hard to help fossil fuel companies and big businesses at the expense of the environment. Some of these actions will cause serious, lasting harm to our climate. But there is still hope. Through the concerted efforts of individuals, companies, and local governments, the United States will hopefully continue to make progress in the fight against climate change.

# Internationalisation: missed opportunities

## Thomas Spruit

As people connect more and more with each other globally, universities see students come and go from all over the world. For students it's an opportunity not only to learn things differently, but to learn and experience different things altogether, such as new peoples and cultures. Universities offer their courses in the English language more often and even bachelor programmes in the Netherlands are taught fully in English. Naturally, besides studying, a student can develop socially and culturally. And I don't just mean learning new drinking games.

The benefits aren't reaped solely by the exchanging student. Those in their home country can enjoy the presence of internationals as much as the internationals do themselves. But this opportunity must be seized by both. Fortunately, a study programme with a relatively small number of students such as

ours ensures Dutch and international students get together whether they like it at first or not. Very few already have a close group of friends on campus before the beginning of the academic year and so internationals and the Dutch intermingle to form new friendships, provided they put in the effort to overcome the evident boundaries; even the ever so sociable SET students tend to stick to friends who speak the same native language. This is not necessarily the case all over campus. In master programmes that directly flow from a Dutch-taught bachelor programme, Dutch students already have Dutch friends, creating a boundary for new students to join them in social activities. For example, it can be hard for students to start a conversation in English with someone who's already speaking with a friend in another language, simply because they don't want to interrupt.

Also, many students from the Netherlands prefer to spend their spare time with the friends they've known for longer but can't meet with regularly due to a busy schedule, instead of actively trying to make new (international) friendships. In my opinion, Dutch students shouldn't be obliged to befriend international students, while at the same time international students should feel at home and know that they can easily talk to someone and socialize.



*Potluck night with the new SETies*

Furthermore, close friendships among the Dutch are formed at the student associations, where virtually no English is spoken at gatherings (the ability to speak Dutch is an unofficial prerequisite for joining some fraternities). I'm not saying international students are shy. Many actively participate in the various university introduction programmes at the end of the summer and form friendships with other internationals. And, as a logical response to the exclusive behaviour of Dutch student associations, students from different countries and continents have set up their own student association, such as LATITUD and the Indian Students Association. Potentially, two things can happen. These associations could unintentionally segregate the

various groups of students even more, or – with the right approach – connect them! It can be difficult for an individual to start a conversation with a stranger when neither is speaking their native language, but it would feel much less awkward at events organised by international and Dutch student associations together with the precise aim to make students with different native languages more approachable to each other. The university could in turn organise events like the Master Kick Off with the same goal in mind. And those who already enjoy 'international' friendships should encourage their fellow countrymen and women to cross the boundary of different native tongues.