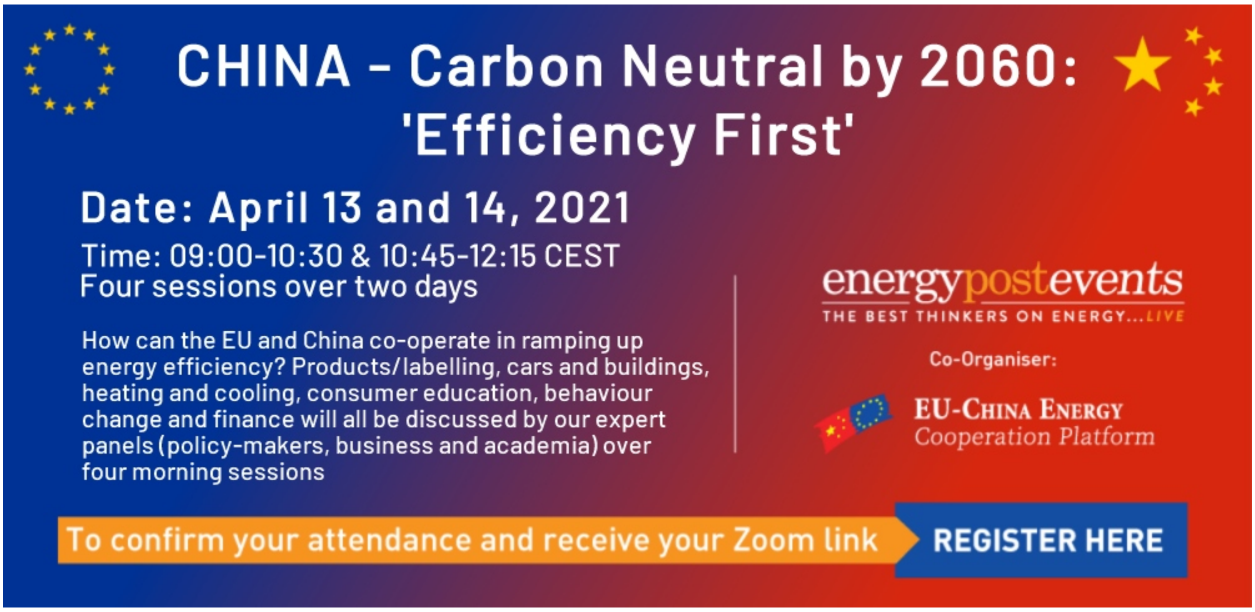
China – Carbon Neutral by 2060: “Efficiency First”

An online panel event held on 13rd and 14th April 2021



Session Two: Financing Energy Efficiency in Buildings

Participants

Julie Kjestrup – Head of Sustainability, DANFOSS (Belgium)
Peter Sweatman – CEO, CLIMATE STRATEGY & PARTNERSHIP (Spain)
Rod Janssen – President, EEIP (Energy Efficiency in Industrial Processes) (France)
Matthew James (Moderator) — Managing Director, ENERGY POST

Highlights

Energy efficiency is the fastest way to decarbonise by 2050 – able to deliver about half the greenhouse gas emissions reductions we need, according to the International Energy Agency. Energy efficiency in buildings can provide about 40% of that.

Action needs to be taken now to reach these targets. The technical solutions to renovating buildings to a near-zero emissions standard exist, funding is available through the EU recovery programme and the multiple health, societal and energy-saving benefits are known. Yet, renovations are not happening, and the industry is beginning to lose credibility.

Under the EU's Renovation Wave, launched in 2020, 3.5 million buildings need to be renovated each year. Only 1% of buildings are currently renovated annually. Only 20% of these renovations are designed to deliver substantial energy savings.

An industrialised, 'one-stop-shop' approach – or an "Amazon of Renovation" - is needed to achieve renovations at the scale required and ensure everyone - the architects, engineers, product suppliers and financiers – are working in sync.

Innovative financing solutions are needed to incentivise the owners of buildings to make the huge upfront costs, which may take 30 years to pay back.

Investments are needed to develop the human capacity. An estimated 350,000 accredited project managers are needed to manage these projects – compared to 10,700 currently in Germany, which manages one of the more advanced EU renovation programmes.

This provides a major opportunity for stimulating the economy post-Covid-19, as every €1 million invested in deep renovation produces 18 local jobs.

But some EU states have still not delivered their long-term renovation strategies. Binding targets are needed to enforce implementation, because they are politically unpopular. Politicians don't want to force voters to make expensive and disruptive changes to their own homes.

If they don't act soon European companies will lose their competitive advantage and the chance to market solutions abroad. While practices and technology for renovating homes to near-zero emissions standards are more advanced in the EU than in China, China will quickly catch up as it makes energy efficiency a focus for the next decade.

Incentivising deep renovations

- Make data on energy efficiency of buildings more public, because it often isn't accessible.
- Only 11 member states upload Energy Performance Certificates to a public database – and in far fewer are they made available to building owners and the renovation industry.
- Massive investment is needed in the marketing of renovation benefits: lower energy bills; improved health and wellbeing from living in a warmer, well-lit house with improved air quality; and a higher property value.
- Marketing is needed to advertise the funding available.
- Customers need to be nudged towards action at the right time. Renovation specialists should meet with all new homeowners to start property renovations before they move in.
- The ability to sell and rent out buildings needs to be correlated to the energy efficiency of buildings. It already is to some extent in the UK and Denmark.
- Properties that are not energy efficient will eventually become un-rentable and un-sellable as they are deemed "unsafe" by society.
- EU renovation targets need to be made binding to force governments to commit to politically unpopular plans.

Financing

- Deep renovations cost the same as a new car, on average around €25,000.
- Renovations can be funded through a mix of grants, loans and/or tax-breaks, particularly for vulnerable communities.

- An estimated €1 trillion is needed to renovate the 35 million buildings targeted in the Renovation Wave. The market could be worth €5 trillion over the next 30 years.
- If targets are made binding and banks are made aware of this they will be incentivised to find more creative funding solutions.
- Some European funders, like KFW in Germany, Kredex in Estonia, VIPA in Lithuania, and the Czech Renovation Fund have built a network of agents to deliver and finance renovations. This one-stop-shop needs to be made available across Europe.
- One financing solution could be to offer customers "zero-coupon" money against their property. The interest rate on the loan will not be paid until after 30 years – or when the property is sold, and at a higher price as its energy efficiency rating means it's worth more.

China

- An estimated $15 trillion is needed for China to reach its 2060 zero-carbon target.
- There is still rapid urbanisation in China. In these regions building new cost-effective, near-zero energy buildings is a higher priority than renovation.
- Construction in China will emit huge volumes of greenhouse gas emissions.
- Europe and China need to work together to decarbonise the cement and steel sectors for both the new-build and renovation industry.
- Building from scratch gives China the opportunity to build smart, sophisticated, wholly-integrated energy efficient urban communities. There is less flexibility renovating old buildings in Europe.
- Citizens will help drive demand for high efficiency buildings. 6% of citizens flag air quality as one of their biggest concerns.
- The EU's more advanced technologies and processes for buildings renovations opens up business opportunity to sell to China. But the window will soon close as China will quickly develop its own local solutions.
- The increased competition from China, as well as the huge-scale renovations needed globally, will drive down the costs of renovations, as it did with renewable energy.

Session Two Summary

This is a summary, not a verbatim transcript, of the key points made during the online panel event.

Julie Kjestrup
Head of Sustainability, DANFOSS (Belgium)

As the European Commission's mantra goes these days: we first need to look at what energy we can save, then we look into the energy structure needed to cover the rest. It is the fastest way for us to decarbonise by 2050.

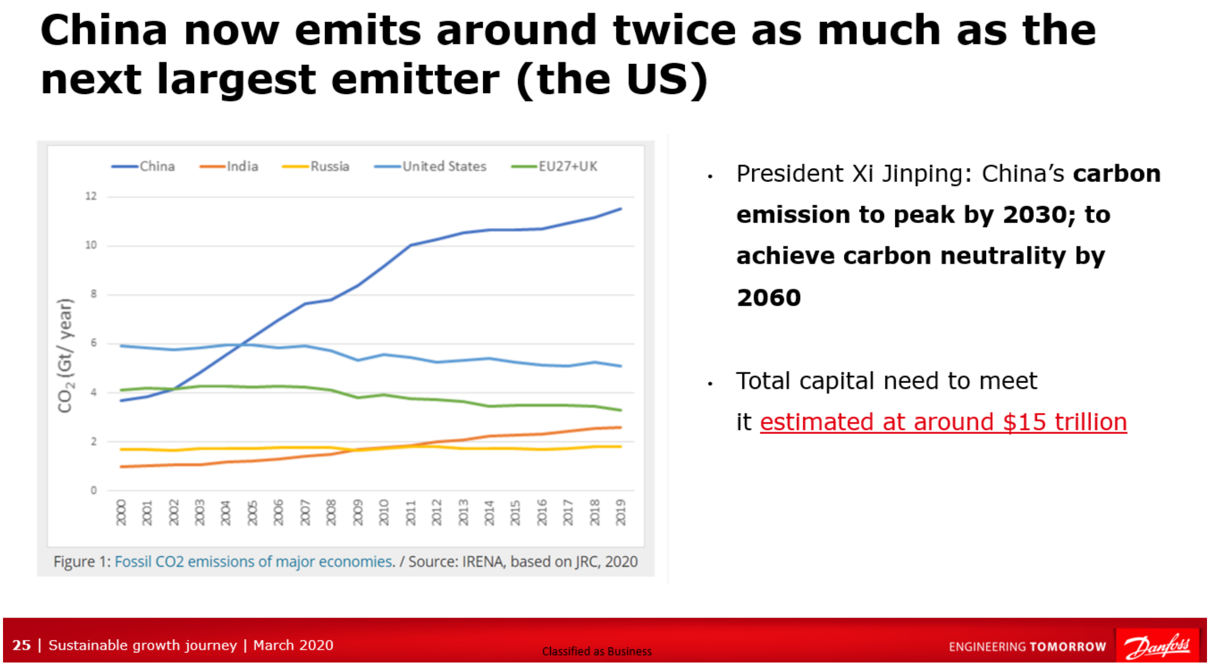
Danfoss has a very wide portfolio of solutions across a big number of industries. What ties these solutions together is efficiencies. We make things that work longer, better, cheaper, with less energy consumption.

The top three markets are the US, China and Germany. We've been in China since 1994. We have 28 sales offices and seven campuses, including one in Wuqing which was named one of the smartest factories by WEF back in 2019.

That factory uses our IT to optimise processes. Smart factories need to be good at adapting smart technologies and at turning investment into operational and financial benefits. Investments need to pay off. We're on the brink of a climate crisis and we need to do something urgently, but we won't unless it's also good for business. The good news is: it is. Energy efficiency for the EU and China can bring growth and jobs and help create a sustainable future.

Some of the global mega trends that are transforming our world include digitalisation, electrification, climate change, food supply and urbanisation. Energy efficiency and buildings sit at the core of most of these. If we are to be serious about to meeting our obligations then that is where we need to start.

Cities account for about 70% of our population, in China it is below that but growing. We need to find a better way to cap emissions as these cities expand.



China emits about twice as much as the next largest emitter, the US. China is due to peak emissions by 2030 and achieve carbon neutrality by 2060. But we need China to cap emissions before 2030, and meeting its targets is estimated to require about $15 trillion.

This is where we see differences between China and the EU. Whereas the EU has sophisticated solutions in place, in China there is still space to manufacture basic solutions locally. That provides a big opportunity for the EU to sell solutions to China. It also means that we will face increasing competition from the Chinese market, but there are also grounds for working together.

Infrastructure & cities

Urbanization – robust engine for China economic growth

- **60.6%** urbanization rate in 2019
- **768** prefecture/county -level cities in 2019
- **200M** new urban population by 2030
- Demolition, construction and every-day running all significantly contribute to 'building' emissions = need to work across all areas

Challenges of air pollution & CO_2 emissions

- China to lower CO_2 intensity by 60-65% by 2030 compared to 2005
- Coal accounts for 56.7% in gross energy consumptions in 2020
- 20kg sce per sqm heating area average, twice of same consumptions in Europe
- Air quality Index remarkably higher in heating season
- China both leader on renewables + biggest (and growing) user of coal

26 | Introduction to Danfoss – March 4, 2021 Classified as Business ENGINEERING TOMORROW Danfoss

There is a huge and growing urban population in China. By 2030 a huge number of cities will be massive on a European scale. What we see in China, more than in Europe, is that the demolition and construction of these new buildings contributes significantly to emissions. So, we need to work on the energy efficiency of new buildings as well as the construction sector.

There's a contradiction in China – on the one hand a lot of renewables and a big push for energy efficiency, on the other growing coal production. Air quality is a major concern for the average Chinese citizen – 6% of Chinese citizens mention this as one of their biggest concerns in a recent study. We see a direct correlation between the heating season and the bad air quality.

Green Recovery in the EU and China

- Both China and the EU have significant recovery programmes.
- In **China, onus is on industrial sectors** – investing heavily in fast-growing green industrial sectors through
- In **EU, onus is on green** – investing with climate and digital focus, significant role of energy efficiency & renovation of building stocks

= opportunity (and need!) to work closer together also on sustainable finance? E.g. leverage existing EU-China engagement on sustainable finance to develop a harmonised global approach to defining sustainable economic activities; 'race for the top' rather than the bottom?

27 | Sustainable growth journey | March 2020 Classified as Business ENGINEERING TOMORROW Danfoss

It's 2021. All countries, including the EU and China, are putting together green recovery programmes. In China they are investing heavily in fast-growing, green industrial sectors, less on efficiency and green energy. The EU is focused on energy efficiency reaching into all sectors.

We have the urgency, the impetus, and the opportunity to work together on issues like finance. It's important that we take the best examples from Europe to transfer abroad. But it's also important to work together to find a harmonised, global approach to defining issues, like sustainable economic activities, to avoid a race to the bottom in terms of how we finance energy efficiency.

Peter Sweatman
CEO, CLIMATE STRATEGY & PARTNERSHIP (Spain)

The energy performance of most buildings in Europe is poor, but this doesn't have to be the case. Three-quarters of Europe's buildings were built before construction codes considered energy performance. They are a legacy that will remain standing well beyond the point at which the economy needs to be emissions-negative.

Europe's Renovation Wave calls for the efficient renovation of 35 million buildings in the next decade, with an estimated total investment need of close to €1 trillion. That requires a more than doubling of the headline buildings renovation rate of around 1%. Just one-fifth of buildings renovations are now designed to deliver energy savings above 60%, but all will need to.

Like the Marshall Plan, we need to respond to the crisis in three ways: identification, financing and execution.

The first step is to identify the Renovation Wave targets. It's fine to say 35 million buildings, but we need a detailed plan as to which buildings. It should start with the worst performing buildings and the occupants' eligibility for funding, grants, loans and/or tax breaks.

The age, state, occupancy, ownership and fuel use of Europe's buildings are described in the member states' national long-terms renovation strategies. But how many of these buildings owners or renovation decisionmakers actually know any of this? And if they do, do they know how to contract for renovation, how much it will cost and whether they can get public support for it?

Energy performance certificates are a partial answer to this lack of physical data. They make the building's performance more visible. Yet only 11 member states upload their EPCs to a public database and in far fewer are they made available to the owners and the renovation industry.

Vulnerable communities – the energy-poor and communities in transition – also need to be identified for transparent grant eligibility criteria.

Renovation isn't everyone's top priority, so if money or fiscal stimulus is available this will provide an additional incentive.

Deep renovations will cost the same as a new car, yet do not benefit from the competitive lease financing packages that car dealers offer. No-cost money and grants for vulnerable communities should be available from governments to promote deep renovations and part-pay for components for which returns take more time, like insulation.

Where is the dealership for home renovations? Are they empowered to offer a fully blended package of grants and low-cost loans?

Some successful European funders, like KFW in Germany, Kredex in Estonia, VIPA in Lithuania, the Czech Renovation Fund, and IDAE in Spain have built the trusted network of agents and collaborators who can identify qualifying buildings renovation projects, undertake the work and provide the necessary information to apply for blended financing packages.

Germany has a network of over 10,700 government accredited energy experts that work with the state bank KFW and Germany's energy agency, DENA, to prepare renovations plans. Like the UK's independent financial advisers, these independent renovations advisors and project managers prepare a technical project, can arrange the financing and are often required to co-sign the loans as a testament to their inputs, interest and as a reference in case the project doesn't deliver.

There are many testimonies in Europe to high-quality, deep renovations with satisfied customers. Yet the risks of execution, hassle and performance delivery remain hard to overcome. The miracle of lower bills, healthy living and on-site power production is passed by word-of-mouth. Retail business models expand virally.

The renovations process business model and the finance supply chain are more complex than a car purchase or mortgage finance. There are fewer easy-to-understand pre-finance deep renovations packages available. This is a particular challenge for SMEs employing fewer than 50 people.

If a qualified renovation project manager could deliver 10 deeply renovated buildings per year, then the renovation wave of 35 million European buildings over one decade will require 350,000 accredited project managers. That compares to 10,700 in Germany.

To sell 15 million vehicles at €30,000 each, car companies spend a total of over €5 billion a year on advertising. We haven't been able to find clear estimates of marketing spend for home renovations. Significant resources are needed to inform European citizens of the benefits of making renovations.

The Marshall Plan didn't seek to provide explicit solutions for Europe's post-war recovery; it offered policy recommendations, co-funding solutions and a coherent package to stimulate the economy – much like the Next Generation EU facility for the Covid-19 recovery.

Rod Janssen
President, EEIP (Energy Efficiency in Industrial Processes) (France)

We have 3.5 million buildings to renovate a year between now and 2030 – 35 million altogether. We should have been setting up working groups inside and outside the Commission to carry out the Renovation Wave.

China wants to use more market financing for renovations and new-build, and we in Europe, through the energy efficiency financial institutions group and other vehicles, want the private sector to play a bigger role.

The Chinese don't meter their heat. To get around this they've been renovating their multi-family buildings as if to a passive standard, so they don't have to share the heating costs.

In our Buildings Directive we talk about nearly zero-energy buildings, but passive buildings here are a niche.

Fatih Birol, the executive director of the IEA, has said that energy efficiency can deliver about 50% of the greenhouse gas emissions reductions over the next decade or two. Buildings can provide about 40% of that.

We know we can deliver buildings to a nearly zero-energy standard, but we're moving too slowly. We have to deliver those 3.5 million buildings starting this year.

Matthew James (Moderator)
Managing Director, ENERGY POST

Are people fully aware of the need for energy efficiency when they renovate their buildings? Do they realise how it can save money in the long-term? Are they aware of the funding?

JK: The Renovation Wave sets a good framework on paper, but we're still struggling on uptake. We know we need to invest more in energy efficiency, we know it makes good business sense, we know there are multiple benefits and we have funding available with the recovery programme – but we still aren't doing it. Why?

Some people don't know funding is available. We're running a campaign in Germany to make installers aware of the subsidies the can apply for renovating houses. It has a high click-through rate, which shows that even people who are working in this field and can benefit from these subsidies still lack the knowledge.

The conundrum with renovating private buildings is that no politician wants to tell their voters they need to make this upfront investment. Public buildings could go first and set the example of what savings can be achieved.

We also need to develop a one-stop shop with energy advisors who can give the general population and bigger buildings owners information on what can they do, what it will cost and how they apply for subsidies.

MJ: Are buildings renovations solid investments for the banks? Do consumers get back the money they put in?

PS: To renovate 35 million buildings over the next decade Europe needs close to €1 trillion. But that's just the first decade of the buildings covered by the renovation strategy. Over the next 30 years it could cost up to €5 trillion.

€5 trillion for the EU27 is roughly the same size as the mortgage market. Half of Europe's wealth is stored in real estate. We are touching at the very core of the way people save for retirement and think about their own self-worth.

We should not expect that to pay back until future generations. We're actually restoring and maintaining for current and future generations all of the buildings that we currently have.

But people need to get comfortable with the idea that it requires fairly major adjustments to make a home near zero-energy. But there are three forms of repayment. Lower energy bills, but it will still take nearly 30 years to pay back. Improved well-being, because you live in a more comfortable, healthy house, with better-quality lighting, better air quality and better temperature control. And an increased property value. Traditionally, property value gradually increases over decades. Buildings with a higher energy efficiency will be more valuable than the colder, less energy-efficient ones.

Once all three of those value streams are put together we begin to see a compelling financial reason, both for banks that want to make sure buildings are always going to be worth more than the debt against them, and for consumers who want to get their money back.

As soon as we start to do things on a massive scale, renovations become easier, cheaper and more innovative.

MJ: It seems that if it's right for the banks and if there's a strong case for the customer it should be a slam dunk. Are the incentives strong enough for us to be able to hit this target of 3.5 million per year? Are people aware of the importance of investing in our environment?

RJ: There isn't enough awareness.

The European Mortgage Federation is working with 23 banks on an energy efficiency mortgage label and green mortgages. They're hoping to get it to 70 companies by the end of this year.

The thing that surprised me is that they're looking at taking this concept to Brazil, Singapore and many other countries, and trying to get into China.

But to scale this up we need to increase the human capacity. The European mortgage federation only has 11 people working on this. We haven't been able to get all the member states to come out with strategies for implementing the Renovation Wave. We need to develop capacity at the national level, at the local level and at the association level. And we need to put some money behind the energy efficiency lobby.

MJ: How can we incentivise people and companies to pay for renovation even when they don’t plan on staying in a building?

JK: If you are an owner of a building, there are the very long payback rates. One way around this is to renovate in stages, so you do some upfront work with a relatively short payback time. You immediately benefit from the results, and some resources can go towards financing the second stage of a project.

One of the big issues in Europe both for private housing and office buildings is the owner-tenant issue. Who pays for what? There is no incentive on either side to introduce any sort of renovation work. In some member states, like the UK, they've introduced a correlation between energy markers and the ability to rent out offices. This forces people to upgrade to find occupiers. In Denmark there is a correlation between the sales price of a house and the energy marker received. But most European member states don't have EPC data.

The renovation numbers in Europe are abysmally low. Most renovations have nothing to do with energy, it's stuff like installing a new kitchen. We need people to see that investing in the energy efficiency of a building is a more attractive investment than a new kitchen.

MJ: Why is it still such a big task to get people to understand it?

JK: To some extent the victim of energy efficiency is that it's so obvious.

We're typical talking about a lot of relatively small investments, which is difficult to package together. Rather than a drip-drip of projects, you need to create something at scale to be attractive to investors. We're struggling to put that together in a coherent framework.

MJ: Do funds like this exists that aggregate the market? Is this a popular investment for pensions or corporates? How is it structured at the moment?

PS: 30% of all of the EU 25 non-financial loans from banks are backed by real estate. An SME that owns a cafeteria or shop or bar will put the value of the real estate behind the corporate loan to its business as a guarantee. So there are banks with a lot at stake in buildings, particularly in the commercial space, as well as homeowning customers with mortgages.

Energy Efficiency Capital Advisors, a subsidiary of my company, is an aggregator. We work with Spanish cities to refinance the energy service contracts that have enabled them to save, in some cases 90%, of their energy bills through the change of public lighting.

You can find a way to put contracts of €1-5 million for midsize Spanish cities onto pension fund balance sheets. They love them because they're long-term contracts, sometimes 20-30 years, they're like a fixed bond and the credit counterparty is a city.

But we will not solve nor deliver Europe's buildings challenge by building from the bottom up.

There is nothing as stimulative to jobs as investing in deep renovation. Each €1 million invested in deep renovations produces 18 local jobs. It keeps jobs in Europe.

The €5 trillion investment could be characterised as a generational transfer of wealth. The younger generations will be doing the work, while the older generations own the buildings.

It's about getting the training and the education and the workforces to work on this grand challenge.

An earlier panellist said that we have to remove all the barriers and then the river will flow. But I think we need to first acknowledge this as a river - because most people don't see it. We can remove and solve the aggregation barrier, but I don't think that will create the river.

MJ: The obvious question then is what will create the river?

PS: Nearly 90% of buildings need a deep renovation. Owners need to understand that their buildings will be renovated in the next 30 years.

It's when you start thinking 'this is going to happen to me, so when and how would I like it to happen?' that you get the size of the market and the impulses. That is the river. It's saying to owners that we need to work together to renovate all these buildings, and if you don't, you will not be able to rent it, and it will probably be deemed by society as unsafe and unsocial.

MJ: So what is the problem? Is it instilling the urgency and desire in the customer? Or is it the access to money? Can you get the money if you want to do it? And does it make sense?

PS: Money is definitely around, but not the kind of money that makes it make sense for most.

We need to offer people zero-coupon money against their property. If you're a homeowner and a young family and you've started paying down your mortgage, the chances are you won't be able to afford additional payments. You can't afford a renovation on an income basis.

A zero-coupon means the interest rate rolls up to all be paid at the end. You could get €25,000 for a deep renovation today and have to pay it back in 30 years. In 30 years' time it may be €30-40,000, but we could create an instrument that only accrues at the rate of the building's appreciation in value, for example. That would make it a win-win: you get the money, the renovation is done, we get the jobs and you get the lower energy bills immediately.

This kind of financing is not available today but would make a significant difference.

MJ: So it's about the structure of the finance?

RJ: Finance has a lot to do with it. The problem is a deep renovation is one of the biggest decisions we make in our lives, other than buying the house itself.

I like this idea of the zero-coupon loan. Somebody said in the chat that Italy has a super renovation loan of a 110% of the renovation costs. The European Mortgage Federation is also promoting green mortgages.

We have to renovate 3.5 million buildings a year, so we have to take a much more industrialised approach to financing.

To do a deep renovation is complicated and complex. Designers, architects and product suppliers need to work in sync.

The only existing industrialised approach is Energiesprong. It has been underfunded but is gaining momentum in France, although it's still niche.

Compared to 10 years ago, we know where the end is: we have to be carbon neutral. Technology has come a long way but we have a long way to go.

Even with the regulation, enforcement in the EU and China is a challenge. I was head of a delegation to China about 12 years ago and ministers told me their biggest problem was enforcement. China is effectively a federal country –Beijing has a hard time telling provinces what to do.

MJ: Who holds the keys to getting the finances done? Are the banks motivated?

JK: Interest from banks is growing. The Covid crisis could be the turning point for this discussion in Europe – and in China in a different way. Jobs are the narrative, and sustainable growth is gaining traction. Jobs in renovations are very local because they're needed in towns, cities, villages, etc. We are creating wealth, local wealth.

The IEA has said energy efficiency is the best sub-segment of the energy system to invest in – and energy efficiency in buildings will provide the most bang for your buck in terms of creating jobs.

The EU has tried and tested solutions we can apply. But if we don't start now China will catch up and we will lose that competitive advantage.

China also has an advantage because, while tearing down and reconstructing buildings causes a lot of emissions, it gives China the opportunity to start from scratch. It can create a smart and integrated system that makes the most of different sources of energy.

PS: The challenge ahead is the rebuilding of 85% of the European buildings stock.

In Europe, and this is slightly similar to China, banks are essentially the intermediaries of choice through which people get mortgages and other types of financing. So banks have access to millions of customers.

However, banks are optimising based on the returns to their shareholders. We have to make renovations finance interesting to banks from a business perspective, which it is not today.

We need a sort of industrialisation in a digital world - an 'Amazon of Renovations'; an organisation which wants to squeeze out every single millimetre of margin in a deep renovation, knowing that this market's size is going to reach €5 trillion over the next 30 years. We should be able to attract innovative new companies.

Europe and China need to work together on decarbonising the cement and steel that goes into new-builds and renovations.

MJ: What's more likely – that people and companies will renovate premises slowly, or that there will be major renovations?

JK: There are different camps. Most people don't want to do any renovations work whatsoever, and if they do they want to have a nice new kitchen. Then there are people doing a sequencing of smaller efforts, and then there are the big-bang projects.

When Danfoss works with companies on bigger renovations we plan in steps and stages. This breaks down what is a very big and complicated process.

Renovations could be part of the buying process. New homeowners could be offered an hour with an energy efficiency consultant who looks at the EPC and suggests renovations. We need to find the best moments to suggest and nudge renovations.

MJ: What's the message you would like the audience takes home? If there was one overriding innovation or change in approach, what would it be?

RJ: If we miss the Renovation Wave target we will be embarrassed. Between now and COP26 we will have a new proposed Energy Efficiency Directive and a new proposed Buildings Directive. These have to be more ambitious than what we've seen in recent years.

There's no obligation to do those 35 million renovations between now and 2030.

PS: Energy efficiency, or demand-side solutions, are not given enough airtime at the COPs. It feels like our last chance to underscore the importance of energy efficiency and the buildings challenge to the attendees of COP.

When the IEA talked about energy efficiency being half of what we need to do for the Paris Agreement, that means that at COP26 half of every conversation should be about energy efficiency. We are way off that.

I started a G20 task force because the G20 represents the 20 countries that use 85% of global energy resources. Saving energy, as we've identified many times, often comes at a profit – and that's before a carbon tax.

MJ: It seems like a great suggestion for a theme for COP26.

JK: There are so many benefits associated with energy efficiency, and yet we don't really seem to be getting across the point.

We need binding targets to better implement directives. We need to follow up on the implementation, and make sure directives are revised this year. We can’t look at the EPB, or the EED or RED as separate directives.

We need to put these directives together, put energy efficiency first and place buildings at the centre of the action as a critical infrastructure. With funding, we can generate a much faster uptake.

***

Summary compiled by Sara Stefanini
Produced by Energy Post