

Nobel Dialogue Week – *Energy Scenarios and Timescales*

Distinguished guests, Nobel Laureates, ladies and gentlemen.

It is a privilege to be able to join you today.

I believe open dialogues such as this one are critical to establish a common ground for action on the energy challenges facing us all.

Some will talk today about what needs to happen; others will talk about what they think will happen.

I will talk about time perspectives, and the pace at which things could happen.

We need to move as fast as we can as time is not on our side.

We can't pretend, for example, that climate change is not a serious issue.

But neither can we pretend that renewables are the only solution, or that they are available at scale today.

We know that energy demand will continue to rise, driven by increases in population and economic growth.

As we think about the energy future, we need to consider two things.

Firstly, where energy demand will grow.

Globally, demand will increase some 40% in the next twenty years.

This equates to two times the United States' current energy consumption, in addition to what the world uses today.

Today, roughly 45% of energy consumption is in the OECD; the majority is in the developing world.

OECD energy consumption will remain largely flat.

And countries such as Sweden show us that it is, in fact, possible for advanced economies to grow even with falling energy demand.

Over 90% of energy demand growth will come from the developing world, where billions of people strive to reach the standard of living that we, in the OECD countries, enjoy today.

By 2030 two thirds of energy demand will come from the developing world.

And beyond this, the developing world's share of energy demand will be greater still.

We all have a joint responsibility to deal with energy and climate challenges, but, frankly, if we cannot find efficient solutions in the emerging markets, our efforts here in Europe will not help much.

Secondly, we must bear in mind the significance of the cost of energy for development.

Today, in the OECD, it takes roughly one barrel of oil equivalent – be it oil, gas, wind or solar – to generate \$1,000 of GDP. Oil would cost around \$100; less for coal; and more for most renewables.

In the developing world, it takes 2 barrels of oil equivalent.

This is because in the developing world, energy fuels not just economic growth but also the transformation from agricultural to industrial societies, with the urbanisation that follows.

As these economies mature, they will also become less energy intensive, but their peak energy demand is still many decades away.

The challenge is therefore twofold:

Firstly, to supply enough energy to meet demand.

And secondly to do so in a sustainable way, balancing environmental concerns with economic prosperity.

All forms of energy will be needed.

It's not a matter of either / or. Even in the most radical scenario from the IEA – the so-called 450 scenario – fossil fuels remain the major sources of energy.

Unfortunately, without any disruptive technology in sight, renewables can't be expected to make a contribution on the scale that many hope, for several decades.

Renewables are the fastest-growing source of energy, but from such a low base that by 2030, we expect non-hydro alternatives to make up just 6 or 7% of the total supply.

These alternative technologies are not generally competitive today, which is why we see such heavy subsidies.

Any such subsidies must be transitional and phase down as scale and technology lowers costs.

Otherwise it will not be possible for Finance Ministers to balance the books.

If this is not judged correctly, there is a risk of subsidies being withdrawn, as they grow too fast.

At worst, this may risk jeopardising the entire renewables industry.

So, how to stimulate sustainable renewables investment is a challenge for policy makers to get right.

The most important step, in my view, to take is to put a price on carbon.

Personally, I can't understand why those burning carbon can do so for free.

We must also learn from the unintended consequences of commendable efforts in Europe.

Tough emissions reductions were mandated, and an emissions trading scheme was implemented.

In addition, extra renewable energy targets were implemented.

This contributed to the price of carbon falling to next to nothing this year.

Meanwhile, in the US, the shale revolution has led to gas displacing coal in power generation.

And partly as a result, US emissions are falling and are now at pre-1995 levels.

Excess US coal has now found its way to Europe, where it costs little to burn thanks to the cheap price of carbon.

And now emissions from power generation are actually increasing in Europe.

So again, policy is at the heart of addressing the climate challenge.

And this is where I'd like to return to the importance of time.

I am confident that a lot will happen in renewable technology development, offering exciting opportunities in the future, that will help mitigate the climate challenge.

But new alternatives will not kick in at scale for at least 20 years.

So we need a strategy to buy us time.

Accelerating the drive for energy efficiency worldwide is the most important action to reduce emissions in the medium term.

As we all know, the data show how little energy is actually put to final use. The rest is lost as waste.

The potential for efficiency improvements is significant, for emissions, jobs, the economy and for domestic energy security.

In parallel, shifting from coal to natural gas would have a major effect.

Natural gas is the fastest-growing fossil fuel, and the cleanest, with half the emissions of conventional coal for power generation.

So, in conclusion, time is not on our side.

The world's need for energy will increase over the coming decades before it might eventually peak.

By then, I believe technology will have played a major role in delivering sustainable energy.

Until then, there is no one solution:

- The potential for further improvements in energy efficiency is huge;
- Replacing coal with gas will reduce those emissions by half;
- The push for development of renewables must continue;
- And in all of this we would benefit greatly from a price on carbon.

If someone can show us a way more quickly in the future, I will be the first to celebrate them.

If they do they may also receive a coveted prize from the hands of the Swedish King and join these future gatherings.

And now my time is up. Thank you.