Energy Transition Monitor

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IEA's report "Net Zero by 2050" indicates major challenges

- **A net zero economy in 2050 comes with huge challenges**
- **Technical implementation will be difficult and needs massive investments in innovation**
- **Whether investments in oil and gas are still needed, differs per scenario**
- **This report is an eye-opener ahead of the upcoming climate discussions in November, where…**
- **… high investments and close international cooperation are needed…**
- **… to make 1.5 degrees still reachable, although it will be extremely difficult**

IEA's 'new' scenario

On Wednesday 18 May, the International Energy Agency (IEA) released a new report called "Net Zero by 2050 – a Roadmap for the Global Energy Sector". In this report the IEA came up with a pathway towards a net zero global energy mix. Although it was not said in such a way, we perceive this report as a finetuning and more detailed version of the existing Sustainable Development Scenario (SDS). This scenario has been published in the recent versions of the IEA's annual World Energy Outlook. In that respect, this scenario was not completely new. But it is more detailed and sounds even more urgently than the SDS-scenario in the latest WEO.

This scenario describes what should be done if global economies have a chance of reaching net zero by 2050, limiting the rise of global temperatures to 1.5º Celsius. So, they started with calculating back from the end-result to now, to see what is technically needed to reach this outcome.

Does this have big consequences?

In the report there are hundreds of suggestions which combine to a pathway to a net zero by 2050. Some of these steps are more radical than others. There is a huge need for further innovation and technological development to bring new technological options in scope and make these not only technically, but also economically viable options. To highlight some other drastic changes: no more Internal Combustion Engine (ICE) car sales by 2035, 50% of heavy road transportation electrified, a change of customer behaviour, and no investments in coal, oil and gas as of today.

Furthermore, the report indicates that there should be much more international cooperation. Not only cooperation between countries to invest in technological development - instead of reinventing the wheel all for themselves - but also cooperation to make the energy transition happen in both developed and emerging countries. Emerging countries sometimes don't have the (financial) resources to follow through on the energy transition without bringing them in a weak geopolitical position against powerful regimes.

The report indicates a strong rise of jobs in the energy sector. Roughly 14 million jobs could be created by 2030 thanks to new activities and investment in clean energy. Around 16 million jobs could come from e.g. investing in efficiency, building EV, and the construction sector. Approximately 5 million jobs in the fossil fuel sector are expected to disappear. This rise in employability can be mainly explained by the fact that renewable energy is more labour intensive per KWH or PJ than fossil fuel is. On top of that, building a new energy mix will create a lot of temporary jobs.

But is this scenario technically feasible?

It would be no surprise that reaching net zero in 2050 is extremely difficult. The IEA indicates that the pathway is 'achievable' but 'narrow'. The report highlights that there is a need of massive investments in new technologies. In fact, approximately 45% of the energy mix in 2050 would exist from technologies which either do not exist today, or are still in test phase or small scale projects only. Many of these options are currently debated and not preferred options. The report clearly shows that, to reach the climate goals, ALL options are needed and nothing can be excluded in order to reduce carbon emissions. A lesson to be learnt for governments is that you need to look at geographical possibilities rather than preferred option.

Another fact is that many technologies need to be scaled up so dramatically, that the current supply of commodities is not sufficient to meet this rise in demand. For instance, the number of Electric Vehicle (EV) car sales. In 2035, 100% of the new car sales should be EV. That is eighteen times more than today. However, a recent report of our colleague Georgette Boele shows that the availability of lithium would 'only' be enough for tripling the current EV car sales. Other technical complications could be the availability of labour to build the new infrastructure, the renewable energy sources, to insulate houses and to make all these EV's.

No more investment in coal, oil and gas?

In this updated SDS-scenario, it shows that investment in new exploration of coal, oil and gas are no longer needed. It is good to keep in mind though that, even in this scenario, there is still a need of oil and gas in the coming decades. It may be clear that coal will be phased our first, before oil and gas will follow. Since natural depletion of oil wells account for roughly 5% per year, it will depend on how fast not only new technologies will emerge to replace the existing ones using oil and gas. But also how long the current cars, airplanes, gas fired power plants, and industry technologies will continue be operational and can be replaced.

It is a fragile balancing act. By not investing any longer in oil and gas, we face the risk of running ahead of the energy transition, with all social and economic consequences attached. By investing too much, some companies will end up with stranded assets. It is good to keep in mind that the International Oil Companies already have lower supplies, and are forced by investors to adopt a faster transition path that the National Oil Companies. International Energy companies closely monitor their customers AND governments and track these developments to set their business plans. This is more in line with the IEA New Policies Scenario (NPS) than with this SDS.

Overall conclusion

The IEA report called "Net Zero by 2050 – a Roadmap for the Global Energy Sector" is describing a scenario towards an economy with zero carbon emissions in 2050. The report was made on request of the British government, who will host the Climate Conference in November 2021. It shows how complicated this transition is, and will be. And although it only touched upon issues like economic consequences and security of supply, the main focus of this report is on the technological challenges which lie ahead of us. In that respect, this report must be seen as an eye-opener which can be used during this climate event.

It shows that governments should work closely together to speed up technological development. Furthermore, they should help emerging countries by taking the lead in innovation and offer financial support. An acceleration of the energy

transition is needed to keep the 2050 climate goals in sight. At the same time it is realistic to say that limiting the temperature rise to 1.5 degrees Celsius will be extremely hard to achieve. After all, this transition comes not only with technological challenges, but also with an economic and social impact. The effects will therefore also differ per country. Each and every country has its own starting point and finish. However, this report shows that by cooperating and combining efforts, solutions to those big challenges may be within reach.