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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, D.C. 20549

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**SCHEDULE 14A**

**Proxy Statement Pursuant to Section 14(a)  
of the Securities Exchange Act of 1934**

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Filed by the Registrant

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**EXXON MOBIL CORPORATION**

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*The following communication relates to a presentation made at IP Week on February 24, 2021.*

**DEVELOPING OUR**

**ENERGY FUTURE**

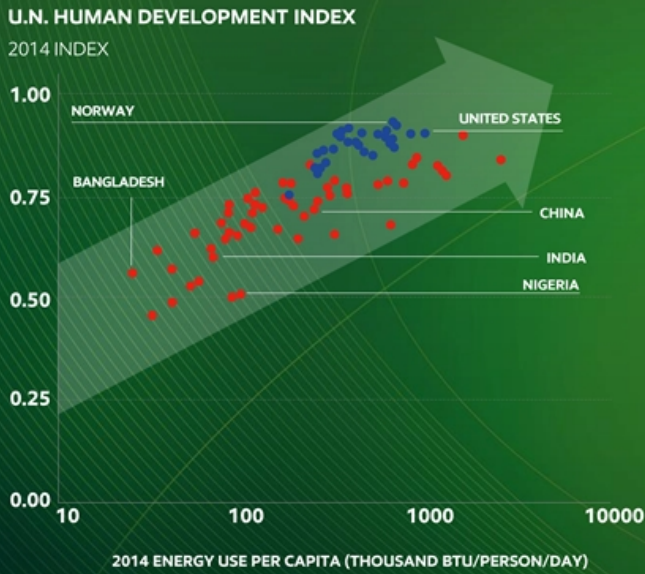
**ExonMobil**

Innovation for the Energy Transition:  
Challenges and opportunities for research, innovation and development

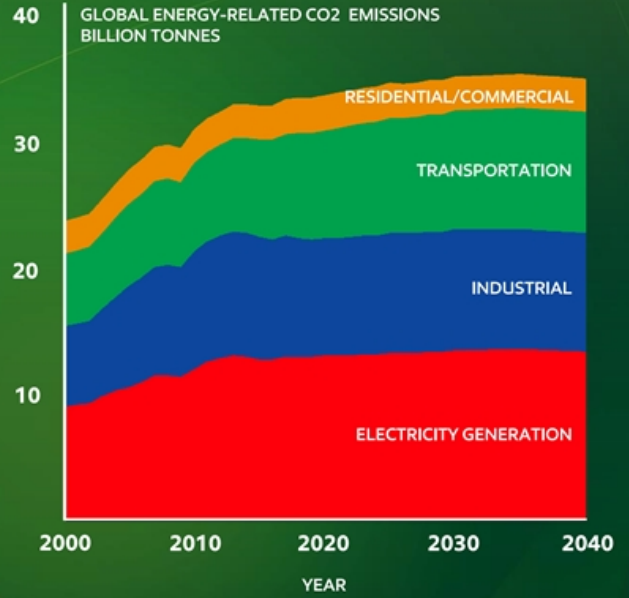
**DR. VIJAY SWARUP**  
VICE PRESIDENT OF RESEARCH AND ENGINEERING

# THE DUAL ENERGY CHALLENGE

## IMPROVING LIVING STANDARDS DRIVES ENERGY DEMAND



## SECTORS ACCOUNTING FOR MOST OF THE WORLD'S EMISSIONS



Sources: United Nations, ExxonMobil Energy Outlook 2019, ExxonMobil estimates

## 34 OF THE 40 NEEDED TECHNOLOGY AREAS CURRENTLY NOT ON TRACK

### ● Power

- Renewable power
- Solar PV
- Onshore wind
- Offshore wind
- Hydropower
- Bioenergy
- CSP
- Geothermal
- Ocean
- Nuclear (↓)
- Natural gas-fired
- Coal-fired
- CCUS in power

### ● Industry

- Chemicals
- Iron and steel
- Cement
- Pulp and paper
- Aluminium
- CCUS in industry & transformation

### ● Transport

- Electric vehicles
- Fuel economy
- Trucks & buses
- Transport biofuels
- Aviation
- Shipping
- Rail

### ● Buildings

- Building envelopes
- Heating
- Heat pumps
- Cooling
- Lighting
- Appliances & equipment
- Data centres & networks

### ● Fuel supply

- Methane emissions from oil and gas
- Flaring emissions

### ● Energy integration

- Energy storage (↓)
- Hydrogen
- Smart grids
- Demand response
- Direct air capture (new)

Source: IEA

# CONVENTIONAL TECHNOLOGY DEVELOPMENT DONE IN SERIES

Discovery



Development



First  
Deployment

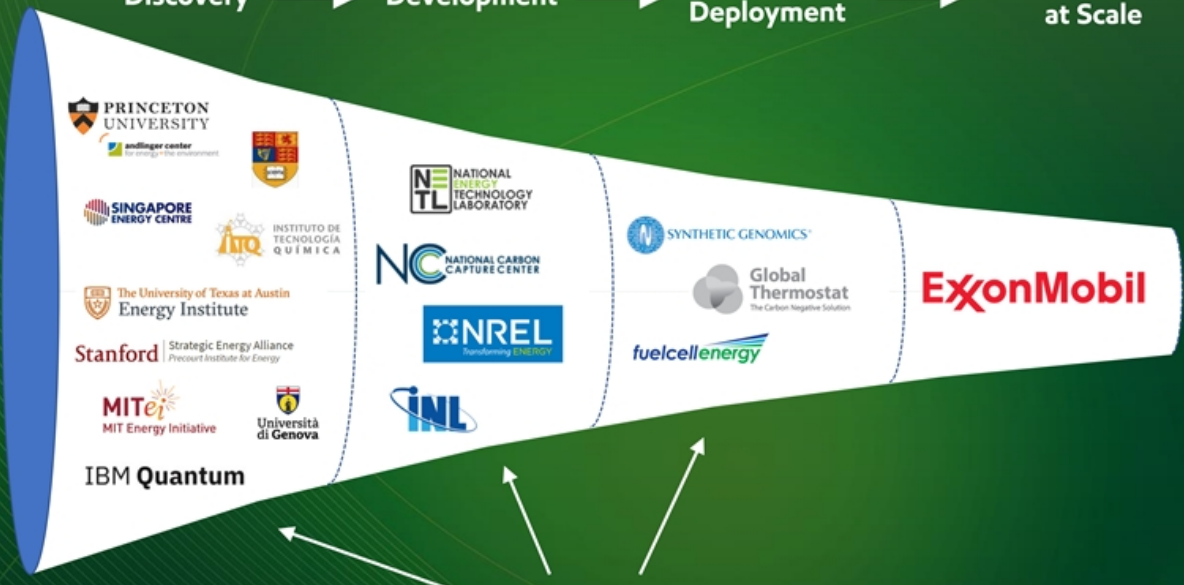


Deployment  
at Scale



# COLLABORATION CRITICAL TO SOLVE THE DUAL CHALLENGE

Discovery → Development → First Deployment → Deployment at Scale



**ExxonMobil**

Integrating affordable and scalable technology solutions

**ExxonMobil**

**Moderator:**

What are the challenges and opportunities in research, innovation and development? Something really close to my heart. I sit on the Board of Innovate UK and I don't think we spend enough on innovation in the energy sector. So our next speaker is going to tell us what he's up to.

Doctor Vijay Swarup from ExxonMobil. A lifer at ExxonMobil from what I can see from your CV. You've been through every single part, engineer, management, planning and now Vice President for Research and Development. So Vijay, I will hand over to you as you're going to give us a presentation and then we can come back to questions at the end, yes?

**Swarup:**

OK, thanks Juliet (moderator), thank you very much for the invitation to speak here.

It is truly an honor to be part of this and I certainly hope everybody is doing well and faring well through these unprecedented times.

I am also very passionate about innovation. And as I listened to the talks and I listen to what is being discussed this week, I think about technology and I think about the need for technology and the technology gap in the need for innovation. And that's what I want to talk about it. I want to talk about innovation for the energy transition. I want to talk about how we do it today? What are the opportunities to do it differently ... to do it in a more innovative way, a more collaborative way, in order to get the technologies that are needed.

What I want to do is start with just a simple scene set. Energy is equal to quality of life. We take it for granted in the developed nations. In developing nations they are still striving for it. The chart on the left is a very simple chart that shows the UN Human Development Index on the Y-axis, which is essentially quality of life. So it's living standards, it's education, it's access to televisions, washing machines, things like that. And the X-axis shows the energy used per capita. The trend is clear. Quality of life, living standards, and energy go hand in hand. The developed nations shown in blue dots tend to be in the upper right of that arrow. The developing nations who strive to be in the upper right are working their way up. That's going to require energy. And that in itself is enabled by technology. So the energy solutions we have today, whether it's oil and gas, whether it's renewables, we have energy solutions today that we did not have 20 or 30 years ago. Much of that is enabled by technology and by innovation.

The challenge we have, of course, is shown on the right. So while we're delivering the energy to a growing middle class, to a growing population, we need to be cognizant of the emissions and we need to work the emissions down. And so what the chart on the right shows is the various sectors that account for the energy related emissions and you can see that it covers from power to industry, transportation and residential.

So we have a regional difference. So countries will have unique solutions and we have sector differences. What that means, of course, is that it's not going to be a single solution. It's going to be a suite of solutions. And it also means it's going to be a suite of technologies and the technologies have to evolve and the technologies have to get better.

So whether it is systems and measurements like we just heard from the previous talk, talking about how do we not only do the simple things today but also the more sophisticated things, we have to look sector by sector and challenge ourselves to say, how could we do what we do today? Keep doing it, keep doing it better, keep doing it more efficiently because efficiency of course is one of the best technologies we



have. Just keep doing things better. But we also have to look for the technologies that can work at the deep decarbonization, and that's what companies like ours do. We have a large research organization and we're working on the more difficult technologies to solve. Now let's just have a quick discussion on what is needed?

When you start a slide that says there are 40 needed technology areas, it immediately tells you that there's not one size fits all. This chart shows the technology areas. It's a piece of work done by the IEA. And it shows the sectors I showed on the previous slide with the status of the technologies within the sectors ... and you can see that 34 of the 40 are not on track. Now that means six are on track, which is good.

But there's 34 that are not. And if you can take a look at what is not on track, you'll see for instance, in Industry you will see heavy energy-intensive sectors like chemicals, iron, steel, cement. In Transportation, you'll see things like aviation and so while batteries will get us so far, airplanes are going to require a liquid hydrocarbon. A carbon hydrogen bond in a liquid form for the energy density in order to move airplanes, and therefore we're going to have to look at different technology solutions there.

If you look in the bottom right, you'll see energy integration. You'll see things like hydrogen and direct air capture. Direct air capture is something that we're working on, and of course it's a very exciting space because it is a way to literally take the CO<sub>2</sub> from the air. Of course the challenge with that is you need materials, you need processes, you need a lot of innovation. So 34 of 40 technology areas not on track but if you actually look deeper at the technologies, the technologies are actually a combination of technologies. And if I just use carbon capture as an example, you're going to need a material, you're going to need a process and you're going to need some way to contact the gas with the material so it is a combination of skills that are needed to take these on.

It's unlikely, in fact it's a fact, that not one size will fit all, not one technology will take care of everything and so it really is looking at the technology areas. Where is innovation needed, and companies like ours tend to focus on the harder-to-decarbonize areas where there is a wider technology gap where we think we can be part of the solution and we can work to do that.

Now let me quickly show you how conventional technology development is done and the keyword here is it's done in series. So it starts with the Discovery, usually in a lab very small scale. You then move to a Development which is often called a pilot plant in our vernacular, but it's basically a small scale demonstration. First Deployment is taking it out into the field to understand how the technology operates in real world conditions, and ultimately you have to Deploy at Scale. The point of scale has been made several times already this week. And of course the scale in this industry is almost unimaginable when you think about how big things have to be. So discovery, development, deployment and deployment at scale. All done in series. Takes long, it can take decades to do this and what we want to think about is, well how can we innovate within innovation? How can we look at the technology process that we do to matriculate technology from discovery to deployment? And how can we do that in a much more efficient and, dare I say, faster way?

To do that, I'm going to take the same chart. I'm now going to show it in the form of a funnel and I'm going to populate it with some of our collaboration partners. Because we believe one of the keys to doing this is collaboration.

As I said earlier, 40 technologies. Within the 40 technologies there are hundreds of capabilities. Those capabilities have to be stitched together and you have to have line of sight to scale to be able to develop the solutions that society wants. So what you see now from discovery through deployment if I just walk you through in the discovery step, you have a lot of universities, you have universities where they have the ability to work on the fundamentals, to work on the breakthrough discoveries that are needed, but you'll also notice IBM Quantum. And that's because we also want to work with folks that are doing the breakthroughs in enabling areas like digital. Quantum computing has that potential. Today we do amazing things with supercomputers, working at speeds that quite frankly I would have never dreamed of when I was a student several decades ago. But we still don't have the ability to model materials the way we need

to. And the super really, really complex problems still take too long on a traditional computer. Quantum can change that. We want to get on the ground floor of breakthroughs like that. So we were the first energy company to join the IBM Quantum network and we continue to collaborate with IBM on trying to understand the application for Quantum into our space.

In the development space, national labs, and I showed the US national labs there, like the National Renewable Energy Lab as an example, but obviously there are national labs throughout the world. National labs have not just capabilities in terms of people but they also have capabilities in terms of equipment, which can speed up the process because instead of having to build and design your own lab facility, the national labs have these capabilities and through collaboration we can test some of the discovery to development.

First Deployment is often done by smaller companies, by nimble companies like Global Thermostat in direct air capture, Fuel Cell Energy in point source carbon capture, that can get us the first deployment. Then finally companies like ourselves really understand scale. And can do the development at scale.

Now, I describe that in series but we want to do this in parallel, and we want to integrate across the four elements and so we take our unique capabilities in R&D. So we have a fundamental research lab all the way through engineering and projects. So we cover the entire spectrum and so we want to have a seat at the table at the discovery. I described IBM Quantum, but we work with over 80 universities working on the fundamentals trying to understand how to shape the discovery with a line of sight to scale. That is a huge enabler. Understanding, working with the folks in Discovery zone to say, OK, that's good, but it's got to be tolerant to an impurity. That's good but that temperature pressure regime is not really practical at scale, and so shaping the discovery, shaping the development working side-by-side with partners at the national labs to understand the operating units, and understanding how that will scale. Working with the first deployment companies, we collaborate with these companies side-by-side, working with them, trying to understand. All trying to do that so we can integrate from discovery through scale. That's the key. We need to work on ways to accelerate. Now this is still a time process. The scale of energy is something that cannot be done in a very short period of time. However, this process that we're proposing here, doing things in parallel, collaborating, line of sight to scale, we believe those three enablers will allow much more efficient and effective and a higher probability of success to develop the technologies that are needed.

Again, we have a technology gap. The technology gap is going to require innovation and collaboration. And if we change the way we innovate, change the way we collaborate, we think we greatly increase the chances of success to solve the dual challenge. That's what we're focused on, and that's what we look forward to continue to do. Thanks so much for your time. I look forward to your questions.

**Moderator:**

Interesting. I'm just going to kick off with one quick question which is ... obviously this process of innovation and R&D, has that changed over time at Exxon? This looks like a kind of new model. Where has that come from and how did you get there?

**Swarup:**

I think so. We are a technology company at the core and we've been doing research and technology for over 100 years and so we've always collaborated. What I will tell you is what we've tried to do more recently is collaboration in parallel. And so increasing our collaboration with national labs, increasing our collaborations with innovative companies that have the technology but may not have the pathway to scale. That's where we think we can bring something. And so the core research, physics, and math, and chemistry, those core capabilities have been underpinning energy for a long time and will continue to underpin energy. However, what we're trying to do, as you correctly point out, is change how we're doing it. Increased collaboration. Increased emphasis on how do you scale. Increased emphasis on how do you scale is really important because there's lots of solutions out there. When you start filtering solutions for scalability that solution set decreases very quickly. And that's what we're trying to shape. And the earlier we can shape it, the higher probability is that will get a solution.

**Moderator:**

And it's interesting, so I'm looking at a couple of the questions on the Q&A. At the moment, looking at the collaborators you got, that's quite US-focused. Have you got a worldwide focus or is it mainly focused in the US?

**Swarup:**

We do. And again, our R&D facilities are based in the US, so I must admit there is an emphasis towards the US. The US has some fantastic universities and fantastic collaboration partners. However, we are working in several countries, several European countries as well as Singapore. We work with the Singapore Energy Center, which is a combination of two universities. We do collaborations with the IITs in India and we have several collaborations with universities in Europe as well. So we do have a global approach to collaboration. Again, the important thing there, is because there are going to be regional solutions, and having a seat at the table in the regions where the inventions and discoveries and shaping those to scale is also important.

**Facilitator:**

There's another question coming through in terms of some of the hard-to-reach sectors, so you kind of touched on it actually with steel and cement. How are you feeling about the innovations and the capability to scale those up? Because we are seeing innovations come through in those sectors already, aren't we?

**Swarup:**

We are and you're going to see it in concrete and cement. You're beginning to see it in terms of how you change processes and you're seeing it in our industry. We call it process intensification. We are a high temperature, high pressure industry at the end of the day, and so if you can come up with novel processes, which as I said, when I alluded to efficiency being one of the biggest knobs we have to turn, that will continue to be a big knob. And efficiency includes rethinking your processes, so we do a lot of research in using membranes for separations instead of distillation. Distillation is thermal. Membrane can be done at lower temperatures with just a little bit of pressure. So it is looking at the difficult, you know, the thermal industries if you will. And thinking do we have to do it thermally? Can we use size as a separation mechanism instead of temperature? And it's rethinking what we're doing so that we can get the energy intensity. Energy itself is energy intensive, and so how do we decrease the energy required to produce the energy that's needed?

**Moderator:**

We've got lots of fantastic questions, but we're going to have to just go to one last one to finish off with. So a lot of these technologies you're talking about the scale, which is obviously really important. Is there anything you're seeing that you really think you can accelerate to bring to scale? Are there some exciting technologies out there that you think are really on the horizon now that you are working on?

**Swarup:**

I think the biggest one that we're working on is carbon capture. I think that is a needed technology. I think there's pretty much consensus that carbon capture is going to be needed. And so we're looking at technologies, electrochemical routes that instead of consuming power can actually generate power. That's modular and so you get to scale by adding more modules instead of making things bigger. Those are different ways to think about how we solve these problems, and we're entering the phase where we're going to understand what the scalability is. So again, patience is needed. Let's not forget that. Research requires patience. Research requires optimism and patience and it requires a broad array of options so that you can move forward. So I am encouraged by what I'm seeing in materials discovery. I'm encouraged in what I'm seeing in processes for carbon capture. We just started a Low Carbon Solutions company that is going to focus on carbon capture initially because we think that that technology is scalable, it's deployable and we have a pipeline of ideas that we think can help address that very, very much needed technology.

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## Important Additional Information Regarding Proxy Solicitation

Exxon Mobil Corporation (“ExxonMobil”) intends to file a proxy statement and associated BLUE proxy card with the U.S. Securities and Exchange Commission (the “SEC”) in connection with the solicitation of proxies for ExxonMobil’s 2021 Annual Meeting (the “Proxy Statement”). ExxonMobil, its directors and certain of its executive officers will be participants in the solicitation of proxies from shareholders in respect of the 2021 Annual Meeting. Information regarding the names of ExxonMobil’s directors and executive officers and their respective interests in ExxonMobil by security holdings or otherwise is set forth in ExxonMobil’s Annual Report on Form 10-K for the fiscal year ended December 31, 2019, filed with the SEC on February 26, 2020, ExxonMobil’s proxy statement for the 2020 Annual Meeting of Shareholders, filed with the SEC on April 9, 2020, ExxonMobil’s Form 8-K filed with the SEC on December 1, 2020 and ExxonMobil’s Form 8-K filed with the SEC on February 2, 2021. To the extent holdings of such participants in ExxonMobil’s securities are not reported, or have changed since the amounts described, in the 2020 proxy statement, such changes have been reflected on Initial Statements of Beneficial Ownership on Form 3 or Statements of Change in Ownership on Form 4 filed with the SEC. Details concerning the nominees of ExxonMobil’s Board of Directors for election at the 2021 Annual Meeting will be included in the Proxy Statement. BEFORE MAKING ANY VOTING DECISION, INVESTORS AND SHAREHOLDERS OF THE COMPANY ARE URGED TO READ ALL RELEVANT DOCUMENTS FILED WITH OR FURNISHED TO THE SEC, INCLUDING THE COMPANY’S DEFINITIVE PROXY STATEMENT AND ANY SUPPLEMENTS THERETO AND ACCOMPANYING BLUE PROXY CARD WHEN THEY BECOME AVAILABLE, BECAUSE THEY WILL CONTAIN IMPORTANT INFORMATION. Investors and shareholders will be able to obtain a copy of the definitive Proxy Statement and other relevant documents filed by ExxonMobil free of charge from the SEC’s website, [www.sec.gov](http://www.sec.gov). ExxonMobil’s shareholders will also be able to obtain, without charge, a copy of the definitive Proxy Statement and other relevant filed documents by directing a request by mail to ExxonMobil Shareholder Services at 5959 Las Colinas Boulevard, Irving, Texas, 75039-2298 or at [shareholderrelations@exxonmobil.com](mailto:shareholderrelations@exxonmobil.com) or from the investor relations