

European Union & UK

Zero Emissions

Climate Action Plan

By Dr. Hari Lamba
(Proposed)



Proposed in Book, “Brighter Climate Futures – A Global Energy, Climate & Ecosystem Transformation,” Dr. Hari Lamba, Regent Press, Berkeley, California, USA, September 2020. www.brighterclimatefutures.com. Image: Maps of the world, Copyright of Proposal © Harinder (Hari) Lamba 2020. Feel free to print this document or distribute electronically (unlimited). When you mention its contents, please reference this document or the above book.

European Union Climate Update

Supplement to the Proposed European Union Climate Plan

October 23, 2021

When the proposed plan that follows was written, Britain (UK) was still part of the EU. So, the attached plan is for the EU of 27 nations plus the UK.

European Union

As of 2017, the EU had achieved greenhouse gas emissions reductions of 22% compared to 1990 levels, which compared to 2020 was three years ahead of schedule. Its one of the few entities (like California) that met the targets of the Kyoto Protocol. Then in June 2021, the EU upped its ambitions by agreeing to reduce emissions by 55% compared with 1990 by the year 2030 (although this includes some carbon absorption in natural ecosystems in the accounting). It also endorsed a vision of achieving net-zero emissions by 2050. The European Green Deal is the declared combination of proposed activities and policies in industry, mobility and transport, energy and finance, to make that happen. There seems to be a big reliance on market and private sector mechanisms to achieve the goals.

<https://www.consilium.europa.eu/en/policies/climate-change/#>

About a dozen proposals drafted in July 2021 which will need the approval of the 27 member nations include a phase out of petrol (gasoline) and diesel vehicles by 2035, a tax on aviation fuel and a tax holiday for low carbon alternatives, a carbon border tariff on import of materials like steel and concrete, more ambitious targets for introducing renewable energy around the block, and a requirement that energy inefficient buildings be renovated.

The EU still does have challenges transitioning out of coal and as the recent tiff with Russia over the price and supply of natural gas revealed, an increasing reliance on natural gas.

It is yet to seen how the EU intends to implement these goals and proposals and the hope is that these are not a lot of greenwashing.

The United Kingdom (UK)

In December 2020, after leaving the European Union, the UK government announced that the goal set for the UK was to achieve 68% greenhouse gas emissions reductions below 1990 levels by 2030 and to aim at being carbon neutral by 2050.

The following proposed plan shows how the EU and UK could essentially transition out of fossil fuels (totally on coal) and do it totally out of wind, solar, energy efficiency and renew storage (green hydrogen and ammonia made solely by using renewable energy like solar and wind – while still maintaining a high level of energy use. It proposes a massive expansion of mass transit, high speed rail and bike use throughout Europe so that after one lands in Europe all local travel (including tourism) would be totally zero emissions.

The Proposed Energy, Climate & Ecosystem Transformation Plan For The European Union (EU 27 & UK))

Current Situation for the European Union

Europe was the center of the Industrial Revolution that has changed the world. Much of the Industrial Revolution of the past centuries was based on coal, from the start of the Watts Steam Engine to the steel factories that built the continent. In a sense, Europe has been thought of as the “developed” region of the world, which together with the other industrialized nations, represent what a “developed” area should look like and what the other nations of the world should aspire to. Culturally and architecturally, Europe has done well to preserve most of its cultural heritage, making it the most sought after tourist destination in the world. However, Climate Change is beginning to devastate Europe in a way that much of that “developed” nature may be unraveled.

The Impacts of Climate Change on the European Union (EU)

Europe is beginning to suffer from heat waves, floods, droughts, fires and sea level rise like never before. The heat waves and floods have been catastrophic. For the past decades, the impacts of Climate Change have been worsening for Europe. In July 2019, one of the worst heat waves ever hit Europe and caused widespread devasta-

tion. Several people died in the heat wave, France hit temperature records in many places, in Belgium and the Netherlands the temperatures exceeded 40 degrees Celsius (110 degrees Fahrenheit) for the first time in recorded history, and Greenland saw fires. Extreme temperatures have been increasing in Europe for the past 20-30 years. 2003 saw the hottest summer in 500 years till then, and resulted in an estimated 70,000 deaths. In 2000 and 2007, England and Wales saw heavy and record rains, in 2007 Greece saw a heat wave and wildfires, and in 2010 in Russia (although not part of the EU) saw a record heat wave that resulted in an estimated 55,000 deaths.

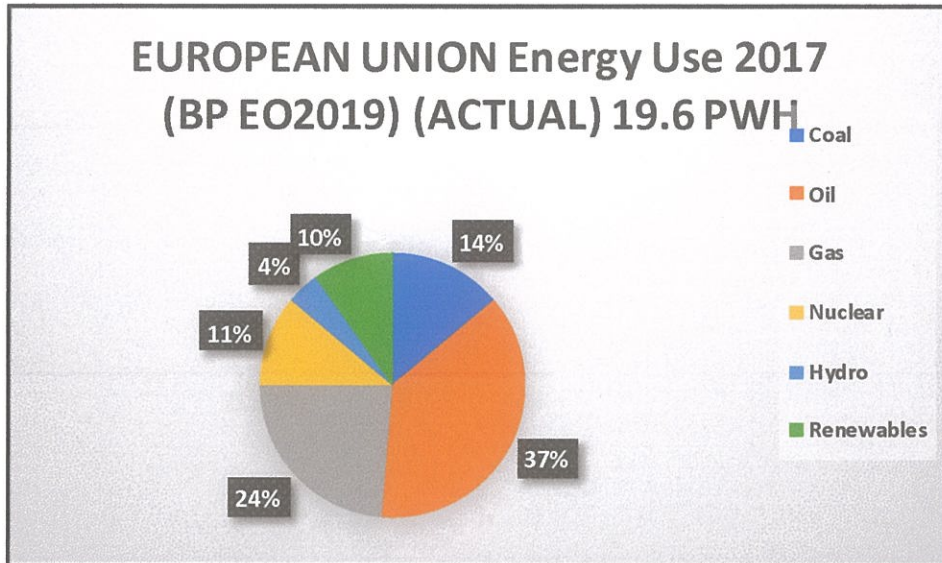
Europe has experienced heavy rains and floods like it has never experienced before. River floods used to occur sometimes, but recently, these have become heavy and catastrophic. In the last few centuries there was flooding, but now almost on a yearly basis there are heavy rains and floods in some part of Europe with severe disruptions, financial losses and its effect on tourism. The Netherlands has famous dikes to protect against the sea, but now with rising sea levels, all coastal regions will be affected and dike levels may have to be raised. Arctic ice has been receding, glaciers have been melting, water shortages have been looming (especially in the Mediterranean region that is seeing more severe heat waves and droughts), wildfires are being experienced and agriculture is being disrupted. A recent study of 571 cities concluded that floods, heat waves and droughts will be affecting all of them as Climate Change worsens.

Current EU Energy Situation and Use

The European Union (EU27) consists of 27 nation states. Its population is predicted to grow from about 505 million in 2017 to about 525 million. Its GDP (Gross Domestic Product or size of the economy) is projected to grow from about 13,000 billion Euros to about 22,000 billion Euros in 2050. If it can be considered a nation, the European Union has been leading the charge in renewable energy, with Germany being a leader in the implementing solar PV energy. Renewable energy production (including bio-fuels) contributed as much as 10% in 2017 to the total energy consumption. The European Union has the best and the most extensive networks of High Speed Rail in world, that extends from Germany and France to Spain. The EU has also led the charge in terms of energy efficiency, with efforts to make every aspect of its energy use more efficient, with the ultimate goal

of reducing its energy consumption even as it grows economically.

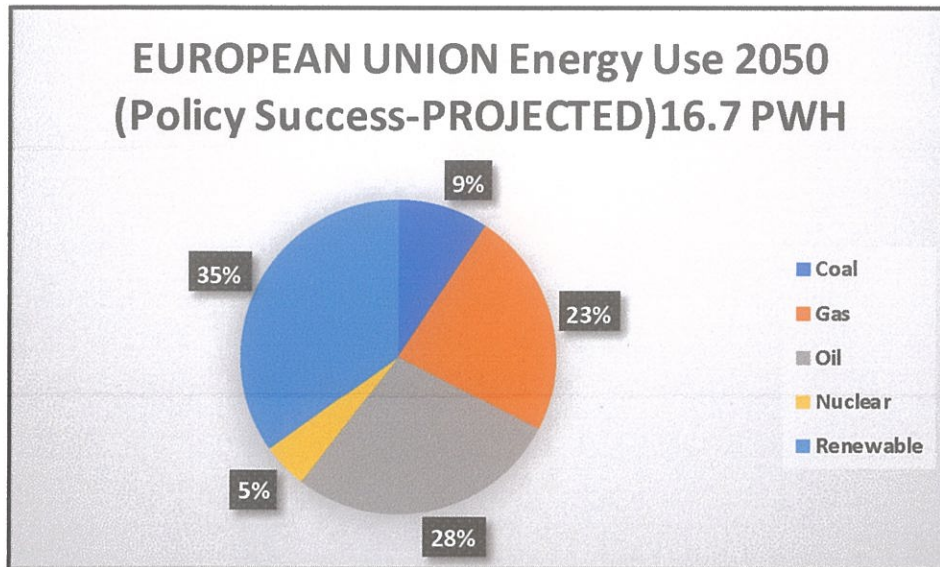
As of 2017, even though the European Union had made much progress in renewable energy, it was still heavily dependent on fossil fuels.



EUROPEAN UNION'S ENERGY CONSUMPTION IN 2017

As can be seen, the EU is still heavily dependent on fossil fuels for about 75% of its use, even though nuclear is a significant 11% and renewables (including bio-fuels) have reached more than 10%. The 19.6 PWH is in the unit of Peta Watt Hours, or about 10E15 watt hours, which is the equivalent of 1,689 Mtoe – million tons of oil equivalent. As of 2017, this level of energy consumption was double that of India, and about half of the US and China. [47]

There is a projection by a group that advocates the use BECCS (Bio-Energy Carbon Capture and Storage) – which means growing large amounts of Biomass (most probably on agricultural land), combusting it to generate electric energy and then capturing the carbon and storing it. It projects that if there are not aggressive moves towards reducing carbon emissions, in a Reference Scenario, fossil fuel use will remain high but renewables will grow to 14% of total. However, if aggressive policies are pursued to substitute fossil fuels with renewables (which they call Policy Success scenario), then the same group projects that fossil fuel consumption will decrease significantly. [48] [49]

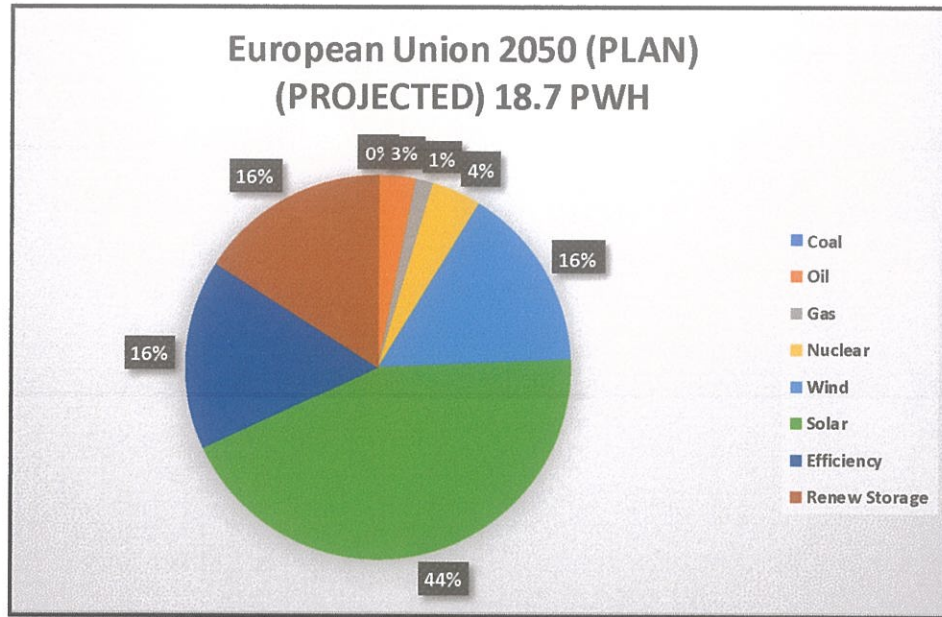


**EUROPEAN UNION'S ENERGY CONSUMPTION
PROJECTED FOR 2050**

This is the projection for 2050, if aggressive policies are pursued, and if what is achieved is Policy Success, then total energy consumption will decrease (from 19.6 to 16.7 PWH), with fossil fuels at about 60%. Renewable energy will be up to a much higher 35%. This will certainly not succeed in getting the European Union to be Carbon Neutral by 2050, which the EU is aiming to do.

The Energy, Climate and Ecosystems Plan for the European Union

Wind energy expands at twice the rate by using both onshore and offshore production. Solar energy expands at a much faster pace than others have projected. For the first time, it is assumed that Europe will use added renewable energy (wind, solar and tidal, etc.) to make and use renewable energy based non-carbon storage fuels like hydrogen and ammonia. The European nations have taken significant action in the area of actually undertaking research, development and demonstration of the production of these non-carbon fuels from green (renewable energy sources) – demonstration projects are already underway.



**EUROPEAN UNION'S ENERGY USE
PROJECTED FOR 2050 BY THE PLAN**

Total energy use FOR EU27 only declines slightly. Coal is gone totally, oil remains at 3% and gas at 1%. Nuclear at 4% is at about what others have projected. The big change is a big expansion in wind (16%), a massive expansion of solar (to 44%), a big increase in energy efficiency, and the coming of age of the use of non-carbon storage fuels produced through renewable energy.

**Here is a description of the Energy, Climate
and Ecosystem Plan for the EU**

The Plan proposed here in this Book is much more aggressive in that it essentially gets fossil fuels down to near zero (with coal down to zero), and does all of the rest with renewable energy, or using energy storage methods that store renewable energy. Coal needs to be gone globally by 2050. **If Poland needs special help, then the EU should help it transition out of coal.** Here is the bullet point list.

1. Overall – Transitioning Out of Coal – Coal and natural gas power plants will be replaced by power plants that have solar PV + battery + natural gas backup. The gas plants will be replaced by “storage fuel” power plants as soon as these become available. Transitioning out of coal for industry – all

- coal use will be replaced by electrification that is powered by renewable energy or uses storage fuels
2. Overall – Transitioning Out of Oil – Mainly the transition of oil based transportation on the roads and highways to reliance on electrical energy (mainly solar energy) and storage fuels.
 3. Overall – Transitioning out of Natural Gas – Europe is overly dependent on natural gas and has to import most of it. This is a very unhealthy situation which is wholly unnecessary, as the EU can meet all of its power and heating needs with renewable energy, where it does not have to pay for the fuel. The entire Mediterranean region can use solar PV as well as concentrated solar power (CSP), which uses the heat of sunlight to generate electricity and can also store energy in molten salts for use at night.
 4. Storage fuels RDD&D (Research, Development, Demonstration & Deployment) – Some European nations are leading the research (along with Japan and Australia, and some in the US) into the production of non-carbon storage fuels. This has to proceed beyond demonstration to large scale deployment. Main areas are: Green production, storage and distribution of fuels, use of fuels for power generation, and their use in vehicles.
 5. Solar–electric highways, roadways and trainways – For road transportation, solar PV charging stations and storage fuel production and supply stations can be placed along highways and roads.
 6. There will be full electrification of buildings, homes and industry to the maximum extent, with the rest of the needs being met with storage fuels. Electrical transmission capacity will need to be expanded accordingly.
 7. Carbon Sinks – Reforest and afforest the European Union, add coastal ecosystems – Europe needs to add 40 million hectares – mainly temperate forests, all over Europe. This will begin to restore much of Europe’s beauty and wildlife. However, as in other regions of the world, the forests need to be designed so that wildfires are easy to control. Europe needs to add coastal ecosystems along the coastlines for the Arctic, the British Isles, the Baltic Sea, the Atlantic Coast, and the Mediterranean sea. Mangrove swamps, salt marshes, sea grasses and coral reefs.
 8. Energy Efficiency – new and existing – Buildings, homes, industry, transportation, and agriculture – The EU has been good

at this – all programs can be expanded and strengthened.

9. **Adaptation to heat and floods** – The EU needs to have a continental plan for preparing for heatwaves, not only by increasing green areas, but also by assisting all of its populations with cooling shelters and low carbon methods of cooling its homes and buildings. With the catastrophic floods in the recent past, Europe needs to put in place an advanced flood control, water harvesting, land wetlands restoration and coastal wetland building that will help it deal with both floods and coastal storms.
10. **Aviation and High Speed Rail** – Europe will transition to using aviation travel only for long haul or large distances, like flying into Europe from elsewhere. Europe already has major high speed rail networks in some of the main EU nations. All travel within Europe will transition to high speed rail, inter-city rail, mass transit and bikeways including human powered transportation with electric assist of all types. Europe is already much better in this than other parts of the world, with the exception of Japan and now China.
11. **Shipping Transition** – storage fuels – Scandinavian nations have started to experiment with use of hydrogen on ships. Other nations are looking into the use of ammonia on ships.
12. **Global Leadership** – With Europe being the first to announce that it will be climate neutral, with the exception of the state of California in the US, it is in an excellent position to convince the other nations of the world to aim for zero greenhouse gas emissions by 2050.

[47] “BP Energy Outlook 2019 – Insights from the Evolving Emissions Scenario – European Union,” British Petroleum, www.bp.com/energyoutlook

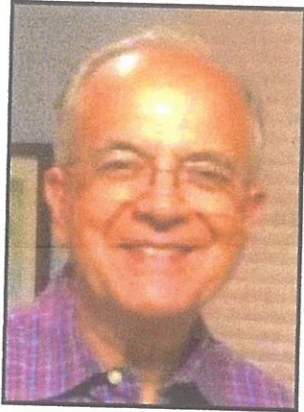
[48] “Negative Emissions Technologies: What Role in Meeting Paris Agreement Targets,” EASAC Policy Report 35, European Academies Science Advisory Council, February 2018, www.easac.eu

[49] “Decarbonizing the EU Energy System: The Important Role for BECCS,” B.S. Rodriguez, P. Drummond and P. Ekins, 2016. <https://discovery.ucl.ac.uk/id/eprint/1532750/1/Solano,%20Drummond%20&%20Ekins.pdf>

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ABOUT THE AUTHOR



The author Dr. Harinder (Hari) Singh Lamba, has experience in engineering, business and ecology. He has a Ph.D. in engineering from the University of Illinois at Urbana-Champaign, with about 40 years of experience in industry, both in engineering product development and in advanced technology. He migrated from India to the USA in 1970 with a bachelor's degree in Aeronautical Engineering. He was one of the founders of the

Earth Summit Network, an informal organization formed in Chicago in 1991-92 to educate the local public about the Earth Summit, or the United Nations Conference on Environment and Development (UNCED) that was held at Rio de Janeiro, Brazil in 1992, where the original global warming treaty was signed. Since then he has been active in non-profit groups, talking about and making presentations on Climate Change.

Through his volunteer work and through self-education, he has also developed a good understanding of environmental (ecological), developmental (technical, economic, industrial and financial) and political (democracy) issues. **Because of his background, he has the unique ability to understand all aspects of the Plan and its solutions needed in energy, climate, economic development and ecosystems.** He has published a number of technical engineering papers and has technical patents. He is the author of a number of books including, "Rethinking Progress – Towards a Creative Transformation of Global Society;" and a "Personal Climate Change Handbook;" 2016, a 40 page book that is available on Amazon. See below for a list of the author's books. The author's aim in this activity is to see the Plan accepted, and something like the Plan implemented globally in a timely and effective manner.