**COP26**

**Objectives of cop26?**

There are four objectives of COP26 which are the commitments to limit climate change. The 26th conference of parties (COP) was held in Glasgow, where four objectives were discussed.

* **Net zero and 1.5 degrees:**

Countries are called onto reach net-zero carbon emissions by 2050 and to keep bloble temperature below 1.5C.

* **Protect ecosystems and habitats:**

States are encouraged to protect and restore ecosystems and build resilient infrastructures to withstand climate change

* **Mobilise finance**

Developed nations are asked to mobilise $100bn in climate finance per year for poorer nations to tackle climate changes

* **Collaboration**

COP26 parties are required to collaborate to finalize the Paris Rulebook, which sets out the rules of the Paris agreement.

**How are they met?**

To meet the requirement of COP26, more than 20 governments and financial institutions like (energy financing) agreed to stop funding new overseas fossil fuel projects with public money by the end of 2022.

When all those countries signed Paris agreement, no countries had a plan to meet these commitments. However, At COP26, countries had to present their plans known as nationally determined contribution (NDC). The success of the conference is judged by how ambitions and binding these plans are.

* The **NDC** of the USA is to achieve an economy-wide target of reducing greenhouse gas emissions by 50-52 % below 2005 levels in 2030.
* Canada's NDC is to reduce emissions by 40-45% below 2005 levels by 2030.

**Did they** **meet?**

The COP26 fell well short of delivering the national commitments that would together limit warming globally to 1.5C. However, there were notable successes in terms of agreement on the 'Paris rule book' and strong multinational initiatives on tackling key issues such as deforestation and methane emissions.

When looking back at Cop21 which completely failed to address that we must stop burning fossil fuels and switch to clean energy. This failure is rooted in the power the fossil fuel industry holds over countries around the world.

**You think they are achievable?**

I think it is achievable if countries work together to enable and encourage countries affected by climate change to protect and restore ecosystems. build defences, warning systems and resilient infrastructure and agriculture to avoid loss of homes, livelihoods and even lives.

**Hydrogen**

**What will hydrogen role be in the future for reducing emissions?**

Hydrogen generates electrical power in a fuel cell, emitting only water vapor and warm air. It has potential for growth in both the stationery and transportation energy sectors. So, when moving from diesel trains to fuel cell trains that link with a network of fuel cell buses would provide a cost-effective solution to reduce carbon emissions because Hydrogen fuel cells are cleaner and more efficient than traditional combustion-based engines and power plants.

There are applications where hydrogen and fuel cells can also play a significant role in the oceans.

**What will hydrogen fuel cells can be used?**

Hydrogen can be used in fuel cells to generate power using a chemical reaction rather than combustion, producing only water and heat as by-products. Fuel cells can be used in a wide range of applications, including transportation, material handling and stationery, portable, and emergency backup power.

**How hydrogen can be stored as fuel?**

Hydrogen can be stored physically as either **a gas or a liquid**. Storage of hydrogen as a gas typically requires high-pressure tanks (350–700 bar [5,000–10,000 psi] tank pressure).

Hydrogen can be stored in **three ways**:

* As a compressed gas in high-pressure tanks.
* As a liquid in dewars or tanks (stored at -253°C).
* As a solid by either absorbing or reacting with metals or chemical compounds or storing in an alternative chemical form.

Text

Description automatically generatedThe PSO levy is a subsidy charged to all electricity customers in Ireland by the Fianna Fáil, (Irish government) to support its national policy, investment in renewable electricity and indigenous sources of energy like peat and security of supply and all subsequent governments have maintained the policy and the charge.

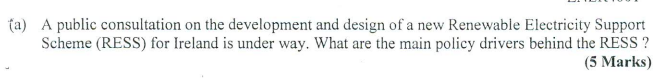
PSO levy are calculated on the basis of the estimated generation required and the estimated wholesale electricity market prices for the year ahead.

Text, letter

Description automatically generatedA large rate of change of frequency (RoCoF) may occur after a severe system incident (e.g. system split or loss of large generator in a smaller system). The facilities shall remain connected to contribute to stabilize and restore the network to normal operating states.

ROCOF protection is based on the idea that if a local generator is suddenly disconnected from the grid, provided that the power flow to or from the grid at that time is not the zero, frequency of the supply that the generator is producing will change.

potentially costly damage to the generator.

The Renewable Electricity Support Scheme (RESS) provides support to renewable electricity projects in Ireland. It is a scheme that invites renewable energy projects to bid for capacity with a guaranteed price for the amount of power generated for a maximum of 16 years. It will operate for a five-year period to 2025, with extension subject to evaluation.

Text

Description automatically generatedThe economic analysis to underpin the new RESS identified that around twice as much new RES-E capacity is needed to meet the 50% RES-E scenario compared to maintaining the 40% baseline RES-E scenario, and more than two and a half times more capacity is needed than in the baseline to meet the 55% RES-E scenario.

This is due to two main factors:

Firstly, while the total amount of RES-E generation needed to meet the 55% scenario is only 15% higher than that needed to maintain the 40% baseline scenario, all this additional RESE generation needs to be met by new installed capacity.

Secondly, load factors for the technologies in the RES-E mix tend to decline as more RES-E generation (including different technologies) is added to meet the higher targets.

Text

Description automatically generated with medium confidence

LNG is the primary energy, offers the best thermodynamic yields and the best energy efficiency. The cost of LNG is considerably more competitive than that of other low-sulphur fuels, such as MGO (Marine Gas Oil). LNG will command an increasing share of the global fuel mix given its lower-carbon footprint and its ability to flexibly supply increasingly diverse markets, customers, and applications - ranging from power generation to marine and land transportation.

LNG demand to rise 25-50% by 2030, fastest growing hydrocarbon. Demand for liquefied natural gas (LNG) is expected to rise by 25 to 50% by 2030, making it the fastest growing hydrocarbon over the next decade.

**IPCC Report 2021 on global warming**

The report provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades, and finds that unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to close to 1.5°C or even 2°C will be beyond reach.

IPCC Report key takeaways on the climate change:

### climate change is indisputably human caused

### 2010-2020 was the hottest decade in 125,000 years

### certain changes we’ve already seen are irreversible

### greenhouse gas emissions are the leading cause of climate change

### climate events are increasing in severity and number in every region of the planet

Text

Description automatically generated

The new market arrangements are designed to integrate the all-island electricity   
market with European electricity markets, making optimal use of cross-border   
transmission assets, which, according to the SEM Committee1, is expected to   
“deliver increased levels of competition which should help put a downward pressure   
on prices as well as encouraging greater levels of security of supply and   
transparency”.

The I-SEM designs to include:

* how energy is bought and sold.
* how generators are remunerated for availability.
* forward trading arrangements and market liquidity.
* market power controls.
* and the systems, policies and procedures that are required to operate the market.

**IEA Energy efficiency 2021**

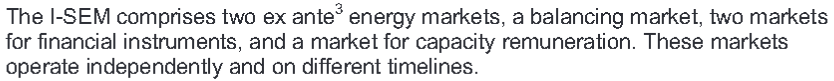
International energy agency (IEA) report on energy efficiency 2021 highlights on global developments in energy efficiency. This 2021-year edition explores recent trends in energy efficiency markets at the economy-wide and sectoral levels, including developments in policy and investment.  
  
The report also focuses on the role of energy efficiency in achieving net zero emissions in the energy sector by 2050, including an examination of the crucial role of efficient appliances and equipment, along with all major energy efficiency net zero milestones in buildings, transport and industry.  
  
IEA report states that Energy efficiency trends are expected to return to their ten-year average after the worst year in a decade, but the rate of improvement needs to double from current levels to match the gain outlined in the IEA Net Zero Emissions by 2050 Scenario. In 2021, global energy intensity is expected to improve (that is, to fall) by 1.9% after improving by only 0.5% in 2020.

Over the past five years, energy intensity has improved on average by 1.3% a year, down from 2.3% between 2011 and 2016, and well below the 4% described in the Net Zero Emissions by 2050 Scenario over 2020-2030.

Chart, funnel chart

Description automatically generated

The Integrated Single Electricity Market (ISEM) is the wholesale electricity market for the island of Ireland. The ISEM arrangements require all market participants to be responsible for delivering or consuming the amounts of energy that they have submitted into the market. Generators, wind farms and suppliers must all manage the exposure to volatile prices for imbalances in their energy in the market.



There are two ex ante (from before) markets for physical energy: the Day-Ahead Market (DAM) and the Intraday Market (IDM). the DAM closes the day before delivery and the IDM operates in the interval between closure of the DAM and one hour before delivery.

Before and into real time, the TSO calls on balancing services to keep the transmission system balanced (i.e. energy supply = energy demand). Energy balancing services are offered into the **Balancing Market** (BM) by generators (energy producers) and suppliers (energy consumers).

**IEA World Energy Investment 2020**

#### The worldwide economic shock caused by the Covid-19 pandemic is having widespread and fall by one-fifth in 2020 due to the Covid-19 pandemic and 2020 is now the largest decline in energy investment on record. Investment activity has been disrupted by lockdowns but also by a sharp fall in revenues, especially for oil due to lower energy demand and prices, as well as more in coming years ahead.

|  |  |  |
| --- | --- | --- |
|  | 2019 | 2020 |
| Oil | $3.6 Trillion | $2.5 Trillion |
| Power sector | $2.8 Trillion | $2.6 Trillion |

#### Fuel supply investments have been hit hardest in 2020 while utility-scale renewable power has been more resilient, but this crisis has touched every part of the energy sector

#### Upstream Oil & Gas in 2019 $483 billion but declined to $322 billion in 2020.

#### Downstream Oil & Gas in 2019 $273 billion but declined to $189 billion in 2020.

#### Renewable power in 2019 $311 billion but declined to $281 billion in 2020.

|  |  |  |
| --- | --- | --- |
|  | 2019 | 2020 |
| Fuel supply | $854 Bilion | $595 Bilion |
| Power sector | $757 Bilion | $678 Bilion |
| Energy end use and efficiency | $280 Bilion | $247 Bilion |

#### Energy should be in the front line of the world’s push for sustainable development, but the investment data reveal a harsher reality

|  |  |  |
| --- | --- | --- |
| **global GDP as a sector** | 2019 | 2020 |
| Fuel supply | 1% | 0.7% |
| Power sector | 0.9% | 0.8% |
| Energy use and efficiency | 0.3% | 0.3% |

**IEA World Energy Investment 2021**

The 2021 World Energy Investment report presents the latest data and analysis of how energy investment flows are recovering from the shock of the Covid-19 pandemic. It examines how investors are assessing risks and opportunities across all areas of fuel and electricity supply, efficiency and research and development, against a backdrop of a recovery in global energy demand as well as strengthened pledges from governments and the private sector to address climate change.  
  
The report focuses on two key questions:

* whether the growing momentum among governments and investors to accelerate clean energy transitions is translating into an actual uptick in capital expenditures on clean energy projects
* whether the energy investment response to the economic crisis caused by the Covid-19 pandemic will be broad-based or if some sectors, geographies and vulnerable parts of the world’s population will be left behind.

#### Global energy investment rebound by around 10% in 2021, reversing most of the drop caused by the pandemic

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2019 (Bilion) | 2020 (Bilion) | 2021(Bilion) |
| Fuel production | $583 | $425 | $457 |
| Power generation | $505 | $513 | $530 |
| Energy infrastructure | $554 | $461 | $544 |
| Industry | $36 | $37 | $39 |
| Transport | $72 | $53 | $65 |
| Buildings | $185 | $200 | $216 |

#### Electricity, led by buoyant spending on renewable power, continues to take the largest share of overall supply investment. global power sector investment is increased by around 5% in 2021 to more than USD 820 billion. Renewables dominate investment in new power generation and are expected to account for 70% of 2021’s total of USD 530 billion spent on all new generation capacity.

|  |  |  |
| --- | --- | --- |
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**OECD/IEA fossil-fuel subsidies 2021**

The latest OECD and IEA data show that the fossil fuel support fell by 10% to USD 183 billion in 2020 in 50 advanced and emerging economies. The transport sector alone saw a 15% drop in support due to the slump in fuel use from restrictions on mobility during the pandemic. Among fuels, petroleum has experienced the largest drop, with support down 19%.

The decrease was due to the declining fuel prices and demand as the COVID-19 pandemic. Today’s climate of rising energy prices, the consumption subsidies has risen again in 2021, aided by an uptick in economic activity. The IEA estimates that consumption subsidies will more than double in 2021 due to higher fuel prices and energy use, coupled with hesitancy on pricing reforms.

However, the reopening of economies has seen rase in energy prices. Government support for fossil fuels encourages their continued production and consumption and so is a challenge for governments’ net-zero pledges, while crowding out investment in sustainable energy infrastructure and other public services.

In principle, any measure that keeps prices for energy consumers below market levels or for energy producers above market levels, or that reduces costs for consumers or producers, may be considered a subsidy. Energy is often subsidised through price controls, which keep prices below the full economic cost of supply.