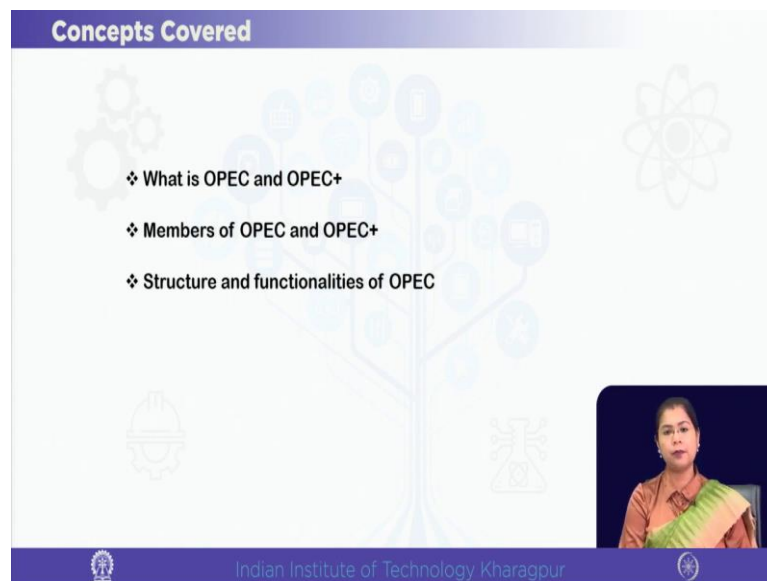


Petroleum Economics and Management
Prof. Anwasha Aditya
Department of Humanities and Social Sciences
Indian Institute of Technology, Kharagpur

Module - 05
OPEC and its role in Oil Price
Lecture - 22
Structure of OPEC

Hi, everyone. Welcome to the NPTEL course, Petroleum Economics and Management. I am your instructor, Dr. Anwasha Aditya, Assistant Professor in the Department of Humanities and Social Sciences of IIT, Kharagpur. We are in module 5 of our course, where we are discussing the role of OPEC in world oil market, especially in controlling the oil price. So, we are in lecture 22 of our module 5, where we are discussing in today's class the Structure of OPEC.

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The slide is titled "Concepts Covered" and features a light blue background with a stylized tree graphic. The tree's branches are decorated with various icons representing different aspects of the oil industry and economics, such as gears, a globe, a person, and a document. The text on the slide is as follows:

- ❖ What is OPEC and OPEC+
- ❖ Members of OPEC and OPEC+
- ❖ Structure and functionalities of OPEC

In the bottom right corner of the slide, there is a small video inset showing the instructor, Dr. Anwasha Aditya, wearing a green and orange sari. The bottom of the slide has a dark blue footer with the Indian Institute of Technology Kharagpur logo and name.

So, to give you a background of the module, if you remember, we have spent quite a lot of time in discussing the oil price movement, since the oil industry was developed in US Pennsylvania to the very recent time of the COVID-19 pandemic and the Russia, Ukraine War. So, discussing the oil price trend and understanding the oil price movement is one of the major motivation of our course, one of the major motivation of the petroleum economics course.

We have done that and we have found that till the development of OPEC in 1970, oil prices moved in more or less in a stable range. After the Second World War, when the economics around the globe were reconstructing, there was increased demand for oil at that time we could see some oil price increase, but more or less it was in a stable range. But we experienced huge fluctuations in oil price, especially from 1970s onward.

We have already discussed the major oil price shocks, there are fluctuations, there are increases and sudden dips also. And those were mainly triggered by the geopolitical events, the crisis in the Middle East, sometimes by some decision of Saudi Arabia and some OPEC countries. So, what we can see is that after the formation of OPEC, the world oil market was subject to lot of fluctuations for events which are also beyond the control of OPEC.

So, we need to now understand the oil price movement, because we have compared and we have seen that oil price trend is just cannot be compared with any other non-renewable resource, neither it can be compared with the major food products or the agriculture products, we have already compared the oil price.

So, why is so? Because, if we compare with oil with other non-renewable resources, other resources which are also in limited quantity, we have seen the data for metal, iron or coal, natural gas, but oil price movement is just phenomenon. So, we need to understand the nature. So, we discussed oil price movement in module 4. So, we are devoting the next two modules, module 5 and module 6 to explain, to understand the nature of oil price movement.

So, in module 5, we are discussing is it because of OPEC that oil price is fluctuating so much and overall, it is increasing. So, in module 5, we are discussing the role of OPEC in the world oil market. In module 6, what we will be doing is that we will be discussing the oil price movement, we need to understand the oil price movement from the point of view of resource. Is it because that petroleum is a depleting resource that oil price is behaving in this way?

So, that will be our course content in module 6. So, let us concentrate in module 5, where we are trying to explain the oil price movement from the point of view of OPEC. Is it because of OPEC that oil price is increasing over time? In a nutshell, this is our question to be addressed in module 5.

So, in first lecture of module 5, we are going to discuss the structure of OPEC, the what are the member countries, where it is headquartered, what are the goals of OPEC and then we will also see the expanded OPEC which is known as OPEC plus. So, why the OPEC plus was formed and what are the structure and the functionalities of OPEC and we will see the role of OPEC in the oil prices.

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What is OPEC ?


- **Organization of the Petroleum Exporting Countries (OPEC)**, a multi-government organisation, created at Baghdad in September 1960.
- **Founding Members : Islamic Republic of Iran, Iraq, Kuwait, Saudi Arabia and Venezuela.**
- OPEC had its headquarters in Geneva, Switzerland, in the first five years of its existence. This was moved to **Vienna, Austria**, on September 1, 1965.

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So, first let us concentrate on what is OPEC? So, OPEC is the Organization of the Petroleum Exporting Countries. It is a multi-government organization which was created in Baghdad in September 1960. So, we had the founding members as the Islamic Republic of Iran, next is Iraq, next is Kuwait then Saudi Arabia and Venezuela.

So, you see there are countries also like Venezuela which are also part of OPEC. So, OPEC had its headquarters in Geneva, Switzerland in the first 5 years of the existence, but that was later moved to Vienna, Austria on 1st September, 1965.

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The slide is titled "Goals of OPEC" and lists three objectives:

- (i) to coordinate and integrate petroleum policies among its member countries in order to provide fair and stable prices for oil producers;
- (i) an efficient, affordable, and consistent supply of oil to consumers;
- (ii) a just return on investment for those who invest in the sector.

The slide also features a video inset of a woman in a green and orange sari, and the Indian Institute of Technology Kharagpur logo and name at the bottom.

Now, OPEC had three major goals. The first was to coordinate and integrate petroleum policies among the member countries to provide a fair and stable prices for oil producer ok. So, that the oil producers can get a fair price. So, the purpose was to maintain the supply in such an extent that the oil producer countries and the exporter countries, they should get a fair and stable price because we have seen that how the oil market is subject to lot of uncertainty and volatility.

So, if the countries are they are just supplying on their own; so, due to increased supply what will happen price can fall in the world market. We have already studied the basic of price formation in a market. So, if the countries are supplying more, total supply will increase that can lead to a price fall.

Therefore, this was the main purpose of these founding members to form an agreement where or an organization rather which could control the quantity supplied. So, that the price is maintained and that price is a fair price and stable price which can ensure profit and export revenue for the countries which are dependent on oil mainly. The second objective of OPEC was to provide an efficient, affordable and consistent supply to the consumers of oil because many countries have to import lot of oil India is an example.

And, we have earlier also seen that there are instances where the decision of OPEC or especially the decision of Saudi Arabia actually maintained the price in a stable range, be

it the low-price period or the great price collapse of 1985 or even during the Gulf War of 1990 and 1991.

We discussed that oil price could have reached further, but due to Saudi intervention; the Saudi intervention means they increased the oil supply. So, oil price was maintained in a stable band otherwise the net importers of oil like India would have even suffered more. So, its not that OPEC countries only looked for their own profit, they were also concerned about the consumers, the countries which are buying oil from them.


So, often there are instances where OPEC maintain the price in a stable band and the third objective was to ensure just return for the investors who are investing in the oil sector. So, these are the three major goals of the OPEC countries.

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Currently, the Organization has a total of 13 Member Countries –

Angola (2007)	Algeria (1969)	Equatorial Guinea (2017)
Gabon (2016)	Iran (Founding Member)	Iraq (Founding Member)
Kuwait (Founding Member)	Libya (1962)	Nigeria (1971)
Republic of the Congo (2018)	Saudi Arabia (Founding Member)	Venezuela (Founding Member)
United Arab Emirates (1967)		

*Year of joining in Parentheses

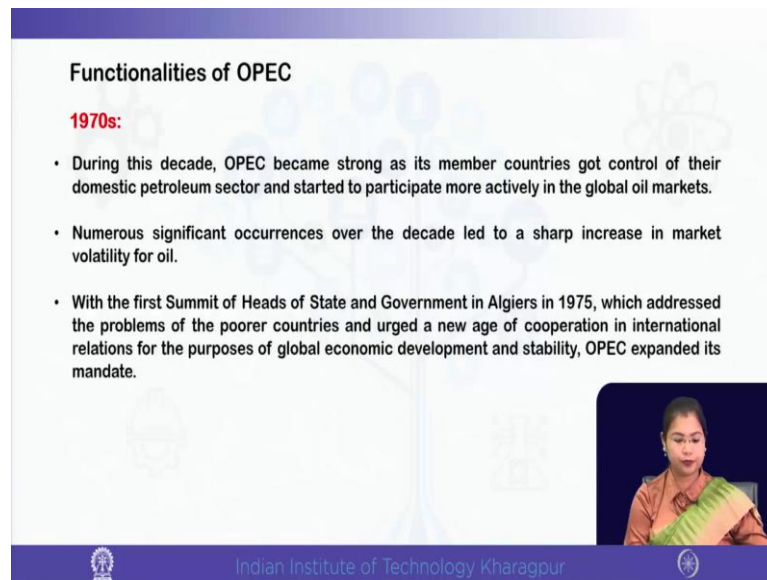


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Now, let us see what are the members of OPEC. So, there are 13 member countries of OPEC and we have written, we have marked in red, we have mentioned what are the founding members, just now I mentioned what are the founding members. So, and then other countries also joined OPEC, you can see and we have mentioned the years in the parentheses.

So, Angola, Gabon, Republic of Congo, UAE, Algeria, Libya, Guinea and Nigeria, these are the other member countries of OPEC. So, we have already talked about the founding members and these are the member countries. So, in total it has 13 member countries.

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Functionalities of OPEC

1970s:

- During this decade, OPEC became strong as its member countries got control of their domestic petroleum sector and started to participate more actively in the global oil markets.
- Numerous significant occurrences over the decade led to a sharp increase in market volatility for oil.
- With the first Summit of Heads of State and Government in Algiers in 1975, which addressed the problems of the poorer countries and urged a new age of cooperation in international relations for the purposes of global economic development and stability, OPEC expanded its mandate.

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Now, what are the functionalities of OPEC? So, let us start from the beginning when OPEC was formed. So, mainly the OPEC started controlling the world oil market from 1970 onward. So, during the 1970s OPEC as a group became very strong because the member countries got control of their domestic petroleum sector.

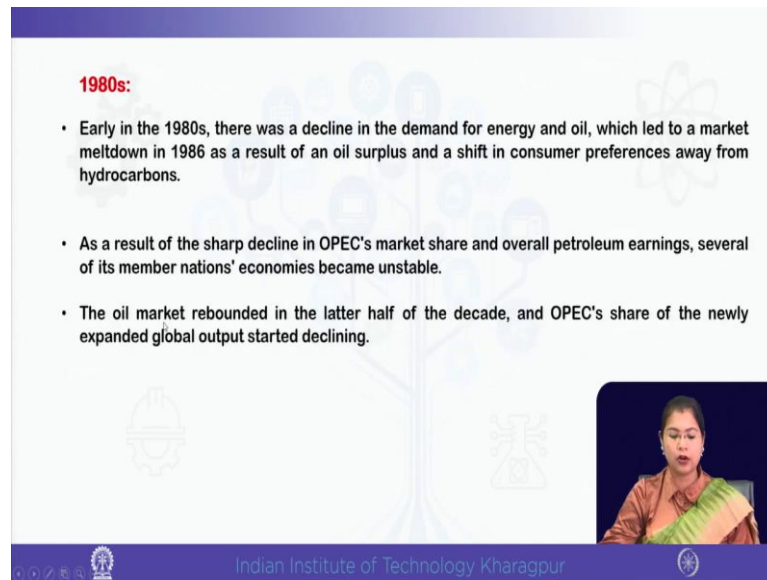
And, they started to participate more actively in the global oil market, because oil became a major traded commodity especially from 1970 onward. We have already discussed that the developed countries in their industrial revolution process, they changed the nature of energy use pattern from the primitive sources to more of fossil fuel.

But the developing countries they entered into the path of manufacturing or industrialization much later. So, their energy demand increased from 1980s, 1990 onward. So, we can see that there is steady increase in the demand for oil from 1970 onward. So, with this increasing price trend, looking at this increasing price trend the OPEC countries also wanted to control the world oil market.

And, there were many events in the 1970s which led to sharp increase in market volatility of oil. You remember we discussed about the oil embargo; we discussed about the Iran Iraq War. So, what happened was the first after the first Summit of the Head of State and Government in Algeria in 1975.

They addressed the problem of the poor countries and urged for a new age of cooperation in the industrial international relation for the purpose of global economic development and stability and OPEC also expanded its objective. So, it is from the 1970s onward, mainly OPEC started controlling the world oil market.

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1980s:

- Early in the 1980s, there was a decline in the demand for energy and oil, which led to a market meltdown in 1986 as a result of an oil surplus and a shift in consumer preferences away from hydrocarbons.
- As a result of the sharp decline in OPEC's market share and overall petroleum earnings, several of its member nations' economies became unstable.
- The oil market rebounded in the latter half of the decade, and OPEC's share of the newly expanded global output started declining.

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So, in 1980s what happened? There was a decline in the demand for energy and oil. If you remember, we have already discussed this issue in greater detail because when the first oil shock happened during the 1970, 1973 and 4 and the second oil shock was due to the Iran Iraq War of 1979. So, what happened initially when there was restriction on the oil supply due to the war or other geopolitical events, there was increase in price of oil.

Because, if there is a fall in supply or abrupt supply cut, we know from our basic understanding of demand and supply if the supply curve shift in; obviously, price will increase. Now, in the short run we know that with the price increase we cannot respond to our quantity demanded change very quickly, because especially for a very important necessary good like petrol because our elasticity of demand is much less in the short run.

So, even with price increase quantity of demanded did not fall much, but what happened looking at the increasing price trend, the developed countries especially they engaged into lot of research and development. And, there were more substitutes which were available in the market in the long run and medium run both in the demand side as well as in the supply side.

See we have discussed in micro economic that elasticity values vary over time right, because in the consumption side we can gradually change our consumption pattern over time. In the supply side also, there will be more alternatives available in the long run as compared to the short run. So, what happened initially due to the oil price shock of 1973, 74 and 79, the countries could not do much.

But, after 10 years in mid 1980s the countries came up with more substitutes both in the demand side and supply side. And, we have analyzed data in detail and we have seen that from mid 1980 onward we started replacing oil in energy production means for electricity.

But, in transportation we are mainly dependent on oil, but from 1985 onwards the new power stations were built that were mainly using the alternate sources like cheaper sources like coal and natural gas, hydroelectric power plants, tidal power plants. So, this replacement was done at a faster rate in the developed countries.

So, if you remember we have also shown the oil intensity data and how the world oil intensity started declining from mid 1980 onward. So, you see the OPEC countries found that the high price policy that they followed in the initial years of their formation that could not be sustained for long. Why? Because, in the long run there were many substitutes of oil because the elasticity is increased right, both in the demand side and the supply side.

So, they had to abandon their high price policy. How they did that? They increased their supply ok, because there were even non-OPEC suppliers as well. So, market share of OPEC also started declining and overall petroleum earnings and the members economies, the OPEC countries, economies also became very unstable. However, towards the end of 1980s again the market revived and OPEC share of the newly expanded global output started declining ok.

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1990s:

- In 1990–1991 timely OPEC intervention limited the market's impact of Middle East crises, but the decade was characterized by excessive volatility.
- The oil market experienced a return to mid-1980s circumstances during the Southeast Asian economic downturn and the mild Northern Hemisphere winter of 1998–1999.
- The oil market, which was transitioning to the post-Soviet world, became increasingly integrated, with a focus on globalization, the communications revolution, and other high-tech developments, but a strong rebound soon followed.

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Now, what happened in 1990s? So, we remember that in early 1990s we had the Gulf War in 1990 and 1991 and also the breaking down of USSR, then Soviet Russia. So, Russia was also a major non-OPEC supplier of oil. So, Russia broke down and also there were the Gulf Wars. But we discussed that during that time Saudi Arabia actually interfered because Saudi Arabia is a major producer, it is a leader inside OPEC.

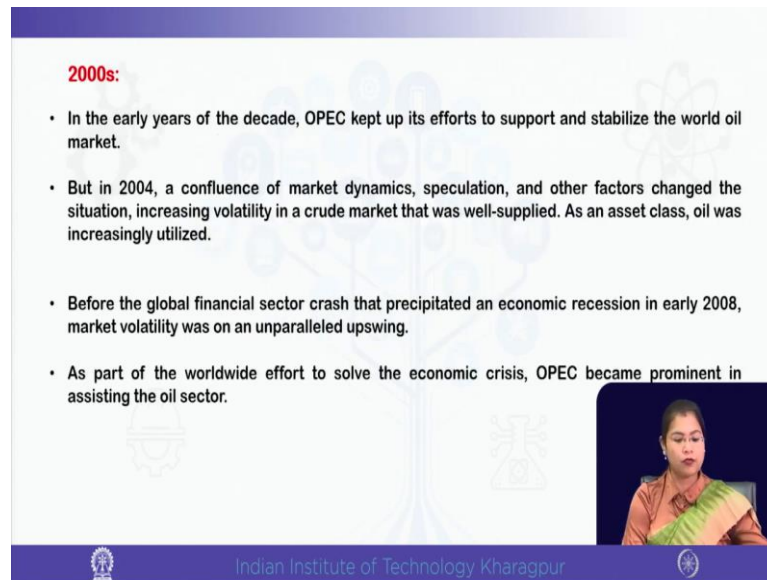
So, it often acts as a swing producer; that means, it can swing the price, it can change the price very frequently. So, by changing the supply Saudi Arabia can change the oil price because, it has the leadership position given its huge endowment of oil. So, in 1990, 1991 what happened? The intervention by OPEC limited the impact of the Middle-East crisis in the world oil market and the 1990s generally experienced lot of fluctuations in the oil market.

So, from mid-1980s we see that there was a declining oil price, again due to the Gulf War oil price started increasing in early 1990. But again we if you remember the movement of oil price when we discussed, we saw that during 1997 and 1998 there was the East Asian crisis where there was a recession in the East Asian countries. So, that also led to again a slump in oil price.

So, oil price all again started declining after almost a decade from mid-1980 to again mid-1990s so, especially in 1996, 7 and 8 these years. So, the oil market which was going through a transition in the era of USSR breaking down. So, it became very

integrated with a focus on globalization, the communication revolution and other high technology development. But also experienced sudden rebound so, is know that there are lot of technological improvements going through.

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2000s:

- In the early years of the decade, OPEC kept up its efforts to support and stabilize the world oil market.
- But in 2004, a confluence of market dynamics, speculation, and other factors changed the situation, increasing volatility in a crude market that was well-supplied. As an asset class, oil was increasingly utilized.
- Before the global financial sector crash that precipitated an economic recession in early 2008, market volatility was on an unparalleled upswing.
- As part of the worldwide effort to solve the economic crisis, OPEC became prominent in assisting the oil sector.

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But the oil market is subject to lot of volatility and we have seen that the experience of the 21st century is the most interesting one, because we could see lot of fluctuations and the oil prices reached new highs as well as new lows. So, what happened in the early years of the 21st century? OPEC kept up its effort to support and stabilize the world oil market.

But, in 2004 with a combination of market dynamic, speculation and other factors changed the situation and it increase the volatility in the crude oil market. And, as an asset the oil was getting increasingly utilized. So, before the global financial crisis of 2008-9, the market volatility was unparalleled because we have already seen that in 2004-5, 6 these years marked the commodity boom period.

So, oil price increase at that time, but again due to the global financial crisis oil price decline suddenly. And, as part of the effort to solve the economic crisis, OPEC became very prominent in controlling the oil sector.

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2010s:

- Early in the decade, as global macroeconomic uncertainty and increased dangers surrounding the international banking system weighed on economies, the global economy was the primary risk to the oil market.
- Throughout the first half of the decade, social instability that was intensifying in many regions of the world had an impact on both supply and demand, albeit the market remained largely balanced.
- Between mid-2011 to mid-2014, the oil market was stable until contracting as a result of speculation and oversupply.
- Then, as the world's oil demand increased, particularly in the Asian region, trade patterns began to change.

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So, you cannot ignore the role of OPEC in controlling the world oil price. In 2010 onward what happened? In the second decade of the 21st century, there was global macroeconomic uncertainty and there was increased danger which surrounded the international banking system. So, there were lot of uncertainties and the global economy was the primary risk to the oil market.

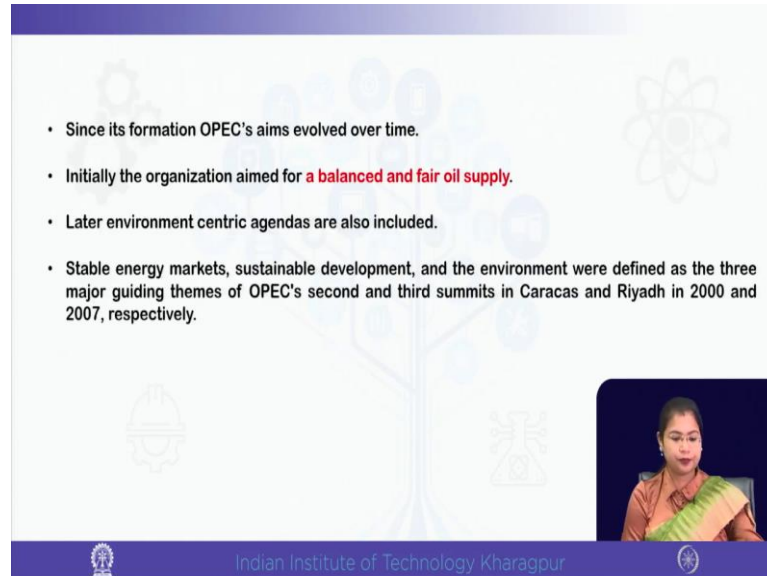
So, you see the events which are beyond the control of the OPEC countries, affected the OPEC countries to a large extent; because these countries are heavily dependent on the ranges or profits coming from the oil export. So, throughout the first half of 2010; that means, still 2014-15 onward there was lot of instability which was intensifying in many regions of the world and that had impact on both demand side and supply side. But more or less the market was stable.

So, between the period of mid-2011 to mid-2014, the oil market was more or less stable and it contracted as a result of speculation and excess supply; because you remember in 2014, we experienced the shale oil revolution. So, US came up with alternative source of oil that is a rock soil. We have already discussed the chemical composition and other details of the shale oil.

So, that was an additional energy supply you can say. So, you can if you plot a simple demand supply analysis so, we can show the shale oil revolution as a rightward shift of

the supply curve which leads to a fall in oil price. But again, the world oil demand increased especially in the Asian region so, trade pattern also started changing.

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- Since its formation OPEC's aims evolved over time.
- Initially the organization aimed for **a balanced and fair oil supply**.
- Later environment centric agendas are also included.
- Stable energy markets, sustainable development, and the environment were defined as the three major guiding themes of OPEC's second and third summits in Caracas and Riyadh in 2000 and 2007, respectively.

So, what we can also conclude from this decade wise analysis of OPEC's intervention in the world oil market, that the aim of the OPEC has also evolved over time. Initially, the aim was only limited to maintain a balanced and fair supply of oil to ensure profit for the oil producing countries. But later they also included the agendas which are related to environment because we have discussed that how burning of fossil fuel can lead to severe environmental consequences like greenhouse gas emission and climate change.

So, environment centric agendas were also included as one of the goals of OPEC. So, stable energy market, sustainable development and environment; these three agendas majorly guided the theme of the OPEC second and third summit in Caracas and Riyadh in 2000 and 2007. So, now you see the goal and the scope has expanded further.

So, OPEC countries are no longer just only concentrated on earning their own profit or making profit out of supply of oil, but they are also concerned about sustainable development, they are concerned about the environmental issues and stabilizing the world energy market overall.

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What is OPEC+ ?

- Due to market conditions, 10 non-OPEC oil-producing nations and OPEC members came together in December 2016 to form the first-ever Declaration of Cooperation, known as OPEC Plus (OPEC+), which aims to help stabilize the oil market by rebalancing the market and reducing inventories.
- OPEC+ was created to combat the ability of other countries to produce oil, which may restrict OPEC's power to regulate supply and price.

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And, not only that even the OPEC also expanded. So, what we can see is that due to market condition, 10 non-OPEC oil producing nations; you can see what are the non-OPEC oil producing countries.

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OPEC+ Countries

OPEC members			Non OPEC members	
Angola	Algeria	Equatorial Guinea	Azerbaijan	Bahrain
Gabon	Iran	Iraq	Brunei	Kazakhstan
Kuwait	Libya	Nigeria	Malaysia	Mexico
Republic of the Congo	Saudi Arabia	Venezuela	Oman	Russia
United Arab Emirates			South Sudan	Sudan

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So, these are the non-OPEC oil producing countries Azerbaijan and Brunei, Malaysia, Oman, South Sudan, Bahrain, Kazakhstan, Mexico, Russia and Sudan. So, these are the non-OPEC countries.

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What is OPEC+ ?

- Due to market conditions, 10 non-OPEC oil-producing nations and OPEC members came together in December 2016 to form the first-ever Declaration of Cooperation, known as OPEC Plus (OPEC+), which aims to help stabilize the oil market by rebalancing the market and reducing inventories.
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So, these 10 non-OPEC oils producing countries and the OPEC countries, they came together in December 2016 and they formed and they announced the declaration of the cooperation which is known as OPEC plus. And, the aim of the OPEC plus is to stabilize the world oil market by rebalancing the market and reducing inventory stock, means the excess supply.

Because, if see if apart from the OPEC countries if the non-OPEC suppliers are increasing their oil supply; so, what will happen? The total supply will increase, price will fall. So, that will be detrimental to all the suppliers, not only to OPEC or non-OPEC, but all the suppliers right.

Now, OPEC though it has a major share of world oil market, but we have also earlier pointed out that it is not the single supplier. Given the huge demand for oil in the world market, OPEC cannot be the monopoly because it cannot fulfil the total demand for oil. So, we do have the existence of non-OPEC suppliers.

So, in 2016 the OPEC and the 10 non-OPEC countries they collaborated. So, they declared the cooperation which is known as the OPEC plus to stabilize the oil market. So, mainly the idea was to restrict or to control the ability of the other countries to produce oil which can restrict OPEC's power to regulate the supply and price.

So, they together decided to stabilize the world oil market for all the countries not only for the OPEC countries, but these 10 non-OPEC countries also.

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2020s:

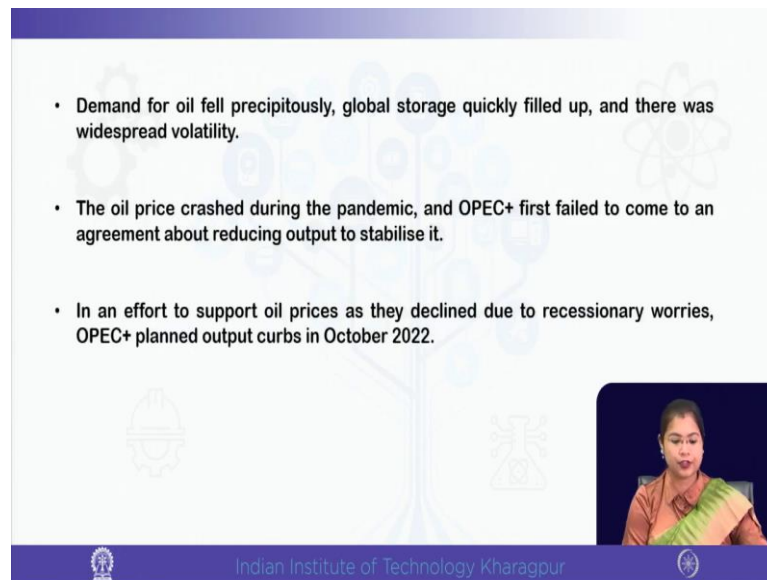
- When the COVID-19 pandemic broke out, it had an extraordinary impact affecting practically every sphere of daily life.
- As a result of the pandemic's negative impacts on the global economy and the energy industry, nations were under pressure to take the required, decisive steps to stop the spread of the virus and mitigate its repercussions.

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So, what happened during the 2020? So, when the COVID-19 pandemic broke out, it had extraordinary impact which affected almost every sphere of daily life. We already know this was just unprecedented. So, stay at home orders where there, less cars where there in the roads, schools and colleges, other educational institutes were closed.

Unless, some necessary goods and services almost the economies or the our modern civilization came to a halt. So, we are all working from home. So, there were stay at home orders, ok. So, due to the pandemic's negative impact on the global economy and energy industry, the countries were under pressure to take the much required timely step to spread the virus and combat the virus and mitigate the repercussions.

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The slide features a light blue background with faint icons of a gear, a tree, and a person. It contains three bullet points:

- Demand for oil fell precipitously, global storage quickly filled up, and there was widespread volatility.
- The oil price crashed during the pandemic, and OPEC+ first failed to come to an agreement about reducing output to stabilise it.
- In an effort to support oil prices as they declined due to recessionary worries, OPEC+ planned output curbs in October 2022.

A small video inset in the bottom right corner shows a woman in a green and orange sari speaking. The footer of the slide includes the IIT Kharagpur logo and the text "Indian Institute of Technology Kharagpur".

So, what happened? We already discussed it enough so; I am not going into the detail. There was a demand side shock and the global storage quickly filled up and there was widespread volatility due to the mainly coming from the halt in transportation or restricted transport, less demand for oil coming from restricted transport. So, oil price crashed.

We have discussed it in detail and OPEC plus, first it failed to come to an agreement about reducing the output to stabilize the oil market. So, to support the oil prices as they declined due to the recessionary pressure, OPEC plus finally, it planned to curb output in October 2022; so, much later. But initially it maintained the supply because as we already discussed that they have invested a lot in ensuring sufficient supply, profit.

So, if suddenly they cut their production that will also be less profitable. So, with increased supply or continued supply from the OPEC and non-OPEC countries and with a demand side shock, we already seen in our last module that the oil price failed during the pandemic, initial phase of the pandemic and the lockdown restrictions and WTI future contract price became negative.


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Current Scenario :

A widening discrepancy between OPEC+ production targets and actual oil output can be noticed due to fluctuating crude oil prices. Due to production capacity restriction, a number of OPEC nations are experiencing these problems.

Following the Covid-19 pandemic, OPEC+ has directed a significant supply cut beginning in April 2020. This aids in regulating the oil market's price war. By raising the output quota each month starting in the middle of 2021, some of this supply reduction has been partially recovered.

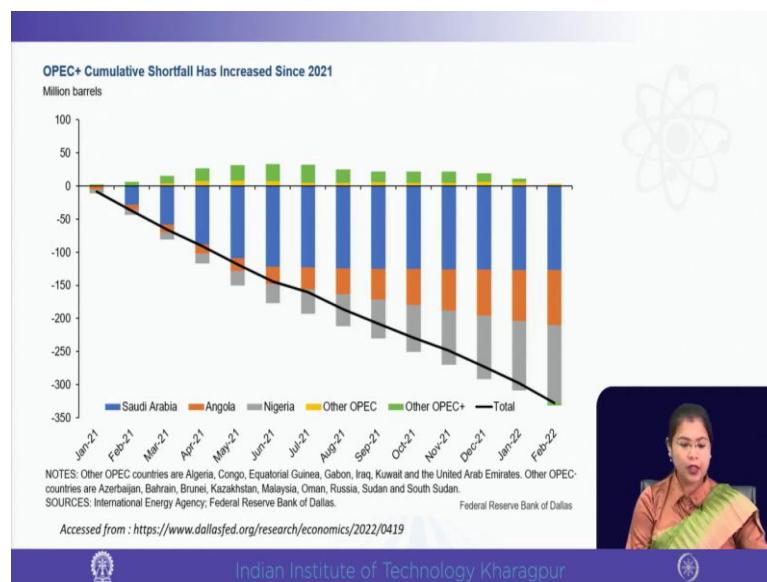
It should be highlighted that if any member country fails to satisfy its specific quota for the month, other members are not there to intervene; making it difficult for OPEC+ to reach a pre-decided production level.



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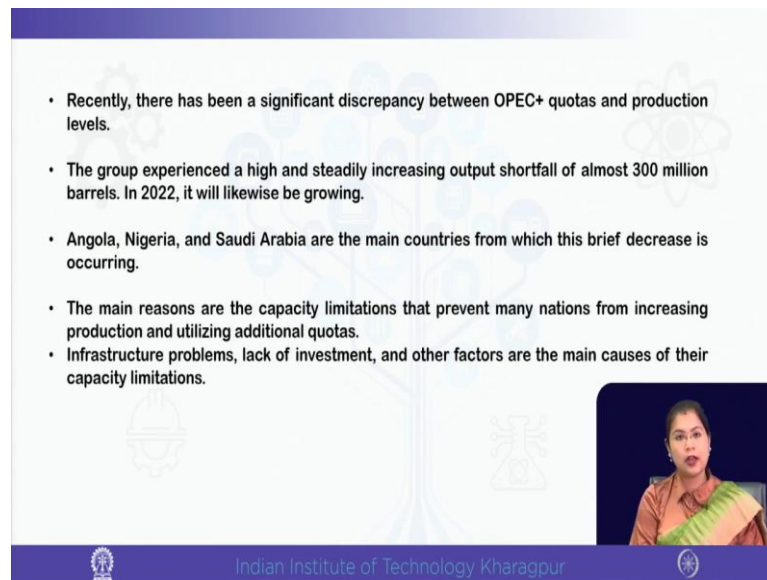
But then again, we saw that the oil price revived due to the Russia-Ukraine War. So, in the current scenario, what is that? There is a wide discrepancy between the OPEC plus production target and actual oil output.

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So, what happened if we look at the data, you see there is a gap between what they decide and how much they actually supply.

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The slide contains the following text:

- Recently, there has been a significant discrepancy between OPEC+ quotas and production levels.
- The group experienced a high and steadily increasing output shortfall of almost 300 million barrels. In 2022, it will likewise be growing.
- Angola, Nigeria, and Saudi Arabia are the main countries from which this brief decrease is occurring.
- The main reasons are the capacity limitations that prevent many nations from increasing production and utilizing additional quotas.
- Infrastructure problems, lack of investment, and other factors are the main causes of their capacity limitations.

The slide footer includes the IIT Kharagpur logo and the text "Indian Institute of Technology Kharagpur". A small video inset in the bottom right corner shows a woman speaking.

So, what happens is OPEC countries they decide, because when we are discussing that OPEC controls the price, how can you control the price? Generally, you decide the output, because if you are supplying more output price will fall. So, generally the price is controlled by deciding by reaching some agreed upon output. But what we saw is that there was a gap between the production target and actual oil output due to the fluctuating crude oil prices and also there was a capacity restriction also.

So, there were two reasons, one was the fluctuating oil price and another was the capacity restriction or almost exhaustion of their full capacity. So, after the pandemic, OPEC plus has directed a significant supply cut which started in April 2020. And, this can help in regulating the oil market price war. By increasing the output quota each month which started from the mid of 2021, some of the supply reductions were partially recovered.

So, initially they were not agreed to or reduce the output, but post 2021 onward seeing the market condition, these countries actually started restricting their output. And, there are also other countries, some of the countries which experienced an exhaustion of their supply or they reached almost their full capacity level. And, it should also be noted here that if any of the member countries fail to satisfy the specific quota for the month, other members cannot interfere, ok.

So, it makes it is very difficult for the OPEC plus to reach the pre-decided or pre-agreed upon production quota level. And, recent in the recent years as I mentioned, there is a significant discrepancy between OPEC plus quota and the production, you can see from this figure. So, with the group the OPEC plus experienced a very high and steadily increasing output shortfall of almost 300 million barrels.

And in 2022, it would be growing, we can see from this report. So, this is the OPEC plus cumulative shortfall which has increased in 2021. So, you can see and the increase means this shortfall is very high for you see for Saudi Arabia. So, we are presenting Saudi Arabia, Angola and Nigeria as individual countries and the rest is given us together. The other OPEC countries and the other non-OPEC countries, means non-OPEC, but they are part of the OPEC plus and this is the total.

So, this is accessed the figure is from the hyperlink which is provided below. So, those who are interested can check in detail. So, we can see the production shortfall, the cumulative shortfall between the OPEC plus quota and the production level. So, what happened in Angola, Nigeria and Saudi Arabia? These are the countries where this shortfall of the quota and the production level can actually be witnessed. So, what is the reason?

The main reason as I mentioned, it is mainly because of exhausting almost their full capacity. So, this is the capacity limitation that prevented these countries from increasing production and utilizing the additional quota. Now, what are the reasons for reaching a capacity limitation? One is the depleting resource and also there are other factors like the infrastructural issues.

There were lack of investment because, what happens when we continue to explore oil from a particular field, what happens is that if the cost of exploration goes up because as we are going deeper into the ground; so, cost of extraction, exploration and even refining also will increase. So, what we need? We need lot of investment.

We need to invest to come up with better technology. We need to invest to explore new oil fields, where the cost of extraction may be less, where the quality of the crude oil is greater means better so, that the cost of refining is less, right. So, these are the factors which led to capacity limitation of these countries and you can see a discrepancy or

widening gap between the production quota and the actual production values which actually has increased since 2021 onward.

You see, in January 2021 it was less, but over time it has increased so much especially for Saudi Arabia, Nigeria, you can see it clearly.

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Conclusion

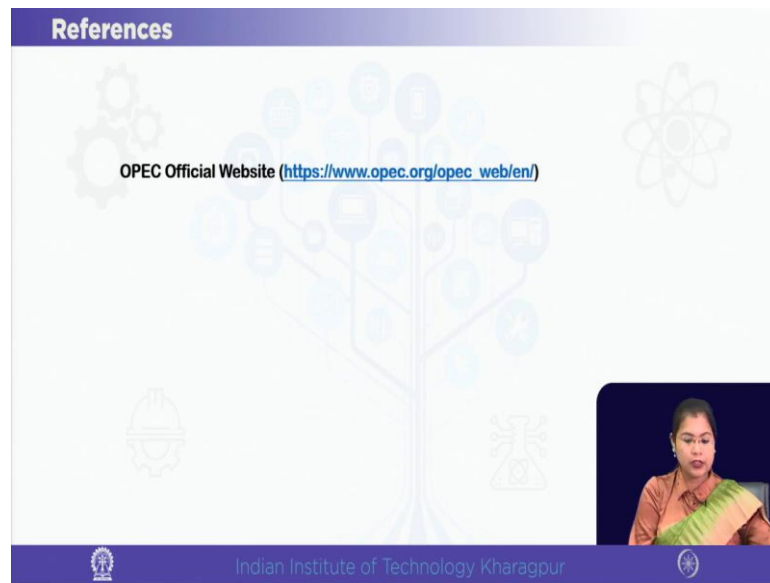
- ❖ Formation of OPEC
- ❖ How OPEC has evolved over time?
- ❖ What is OPEC+?

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So, in today's class if we summarize, we discussed about the structure of OPEC. So, overall, in this module if you remember, we will be discussing about the role of OPEC in controlling the world oil market. So, in today's lecture we discussed about the structure of OPEC, the goals of OPEC, the member countries and then we discussed how OPEC interfered in the world oil market from its formation that is from mainly from 1970s onward to the very recent time.

But in between we saw that in 2016 there was a new development where some non-OPEC countries, but which are the major suppliers of oil, they also collaborated with the OPEC countries and they formed the OPEC plus. So, we also discussed the structure and the functionalities of OPEC plus. So, this was our lecture and in the next class we will be going into the detail of whether OPEC can be termed as a cartel or not.

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So, these are our today's lecture, we see that there is no particular book reference, but one can refer to the official website of OPEC to get more insight on the structure and the functionalities of both OPEC and OPEC plus. So, with this I finish the first lecture in module 5, where we discussed about the structure of OPEC and OPEC plus so.

Thank you very much.