Introduction to Law on Electricity
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Lecture: 06
Energy Mix

In today's session, we will be studying about energy mix. And we will also, before moving to the energy mix, try to understand what all strategies are needed for achieving energy security, which we discussed at length in the last session.

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So, these are the concepts which we will be covering in this session. We will try to understand, what are the challenges to energy security. We will then read about the energy mix, and then we will see what the sources from where we are getting are, what the division is, the reason, why it is on the generation, on the consumption pattern and all. This is just a statistic to understand where we stand.

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Now, when you talk about the strategy, as I have discussed in the last session, energy security is a vital component. A vital component is not only for the development of the power market but also for the overall development of the country and the inhabitants of the country. And for this, you need to have a very robust strategy. It is a known fact that import alone cannot help you.

And at the same time, there is not enough resources available domestically for sustaining this sector. So, you have to draw a balance; there is a need to draw a balance. Draw a balance where on the one hand, there shall be proper tapping and harnessing of the indigenous sources. And then, how to work on efficiency, how to work on conservation, so that there should be lessening of dependency from the outside.

And as I said, harnessing indigenous sources and particularly renewables, will be possible only when necessary technological development is taking place in the country. And that requires the involvement of time, involvement of resources to bring a product which can be a game changer.

And, electricity as a product, you need it immediately. Because this is one of the lifelines for the economic growth, this is the lifeline for fulfilling social entitlements. So, the country cannot wait until there is innovation in the sector, the country cannot wait until that time.

And thus, hand-holding is required between developed countries and developing countries. And this hand-holding is already there, but there is more in terms of the supply side. Because there is sort of dependency on supplying of gas and oil, as I said in the last session, from Gulf

regions, when you consider India as a case at hand. And you can very well visualize that this kind of dependency is also getting driven by geopolitical considerations. There are geopolitical considerations involved into it, that how the politics is playing a role, and what kind of international relations are being established, all these have a role to play in energy security.

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And therefore, what is needed is cooperation, coordination and, at the same time, sufficient focus to develop internal market. Internal market in terms of tapping of the resources, internal market in terms of investing to make the fuel clean when you talk about conventional sources.

So, what you find is that the growing population and the growing expectation of individuals to lead a better life is getting centered, getting focused on the very aspect of energy security. And therefore, what is needed to have a broader approach. Broader approach to ensure that it is not only about how smoothly a supply can be ensured of energy sources but also to see how there can be effective management on the demand side, and how good we are in achieving energy efficiency; those factors are also to be brought in.

So, the earlier approach which was there in the 1970s, where the focus was only to ensure that there should not be any bottleneck in the supply of crude oil from the Gulf countries. Now, what is also needed and it is happening, and it is happening because of the agenda set in the 2003 Act. That, let the necessary strategy be there also for indigenous sources, our own what belongs to our own and in that obviously, renewables play a significant role.

So, now, it is more inclusive, I would say. Why is it more inclusive? Because we are not talking only about supply, we are also talking about demand. We are also talking about exploring our own resources, be it in gas sector, be it in oil sector or be it in renewables.

And therefore, there are four factors which are to be considered for anchoring the very discussion discourse on energy security, availability, accessibility, affordability and acceptability. It must be available, and it must be accessible, it must be within reach, it must be affordable and also, at the same time, it must be acceptable.

Acceptable; what does it mean in terms of when you visualize a situation of the input happening? And then, you are being pushed to the corner to get the supply. Acceptability also would mean in terms of cleaner sources, in terms of what is minimizing the damage to the environment. So, these are the factors which are there in the account.

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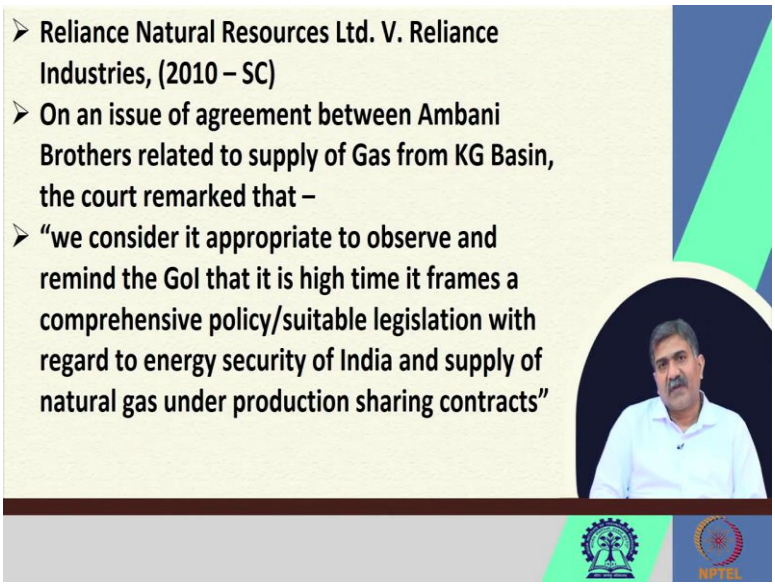

Now, energy security is one issue you would find even the Supreme Court has said in this 2000 judgment, which is a phenomenal judgment on sharing agreement with regard to the production of gas at KG Basin. There was a family dispute between Anil Ambani and Mukesh Ambani. There was an agreement between these two brothers about the supply of gas from the KG Basin.

And ultimately, the question was raised of what shall be the effect, and the bindingness of such agreements. I am not getting into that debate. Because that is a separate subject altogether. But then, the Court has made a remarkable observation on energy security. Court

has said that natural resources are such which cannot be sold in such a manner so that the interest of the nation is compromised.

And in this regard, the Court has said that there is a need to come up with a comprehensive policy on energy security. That is what the court says that there is a need, let there be policy, let there be legislation to address energy security because we are dealing with a very delicate issue. On the one hand, we are dealing with the import matter where you have the issue of a foreign exchange getting used for, getting used for buying that source.

On the other hand, you also need to invest in the available resources in your own country. So, delicate issues are involved, and all these are for the welfare of human beings. And that is what it suggested, that let there be a comprehensive policy. So, this is what the Court says.

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Now, what are the challenges to energy security? That is also look at it. Policy challenge, there has to be enough attraction for the investors to come, and we have read, while understanding the salient features of the Electricity Act of 2003, that changes are being done in terms of providing for open access, in terms of long-term power purchase agreement, so that there will be a sort of confidence to the investor, all these changes are being done.

And we know very well that coal is still contributing larger segment in generation of electricity. And it is certainly one source which causes a lot of environmental damage. And that is why the issue is that can we think of replacing, if not entirely, at least substantial part with renewables. And that is possible only when you have a necessary policy in place. Electricity Act deals with electricity from other sources, I would say. There are scant references of renewables.

But then, of late, we have seen that regulations are being made by the regulatory bodies for promoting renewables, be it a policy on the rooftop, be it a policy on integrating with the grid from renewables, the necessary efforts are being made. Then, the issue of accessibility challenges, accessibility of electricity and which must be a reliable one, not with poor quality. And then also of affordable prices, including with the greener energy.

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Infrastructural skill-related challenges there that when you talk about technical and commercial losses, you need to have a necessary investment on the technical side, and you need to impart the necessary skill to manpower for addressing those issues. The kind of responsibility which is interested on discoms, there is a question of whether they do have adequate skilled manpower for handling those responsibilities. And then the issue of maintaining the balance.

What is the balance? On the one hand, allowing the market forces to take a call on what is good or bad for them and the government playing only a regulatory role. And on the other hand responsibility of ensuring availability of electricity to the marginalized section of society. Because electricity is one which cannot be made available only with a factor of paying the cost, so, it is a debate between consumers versus citizens.

Are we looking at only the paying ability, or are we looking for a mid-path? We are looking for somewhere a kind of balancing factor that how it can be ensured that the ones who cannot afford it. They are to be made empowered so that, in time to come, they can be in a better place to afford the cost. But then, till that time, there has to be some kind of support mechanism to be put in place.

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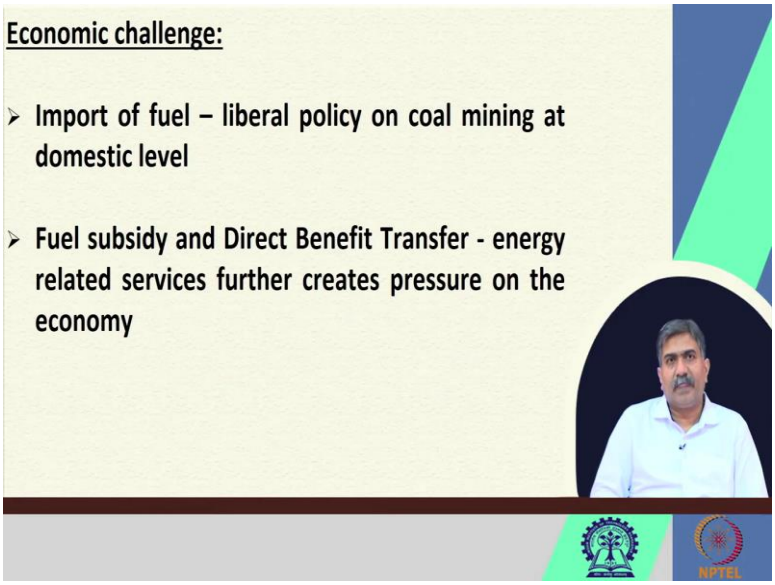

Now, there is economic challenge. What is economic challenge? That, as I said, is the dependency on import. And then, dependency on import, but at the same time, it is also needed that whatever is there with you, you must ensure, the government must ensure that it is optimally used for the growth of the sector.

And recently, the government has liberalized the coal mining policy, which certainly is going to go in a long-term sense to the benefit of the market. Then the question, as I said, that availability of electricity is also needed for those who cannot pay.

So, for that, you have a subsidy scheme, and for that, you have a direct benefit transfer scheme, but then, what is needed is that it must operate in a transparent manner. So that the intended beneficiaries, the targeted beneficiaries, are only getting the benefits, getting the services which are needed, and not the ones who are in a position to pay.

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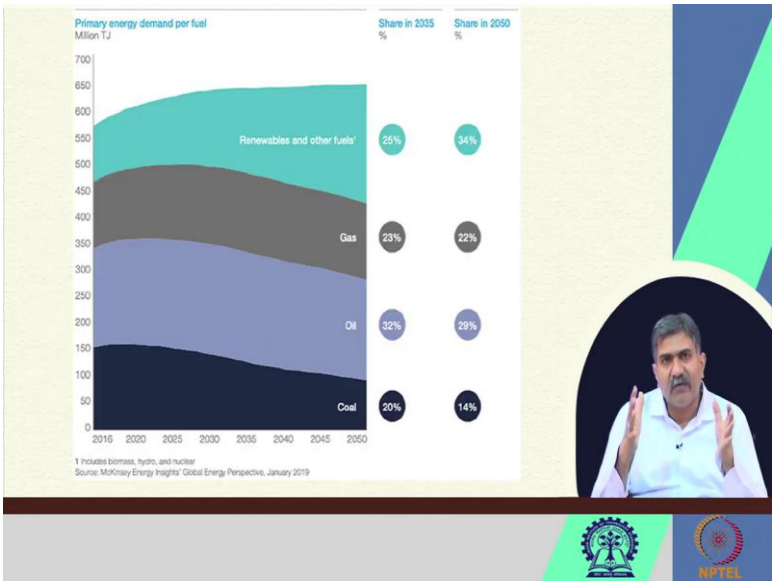

Now, through this graph, I want to portray one thing when you look at the sector, the sources which are going to drive this market, you find that by 2050, the largest portion would be of renewables, and the contribution of coal is minimizing, it is coming to 14 percent. Now, this is what is the trend, and accordingly, planning must be made so that we should not be left behind.

Enough investment is needed to make electricity from renewables competitive already off-late. We are reading about it that it is very much possible. Also, this will help the government to make a plan that how much to invest if there is a government-owned company in thermal power plant, or how much investors should be asked to come and invest in this sector.

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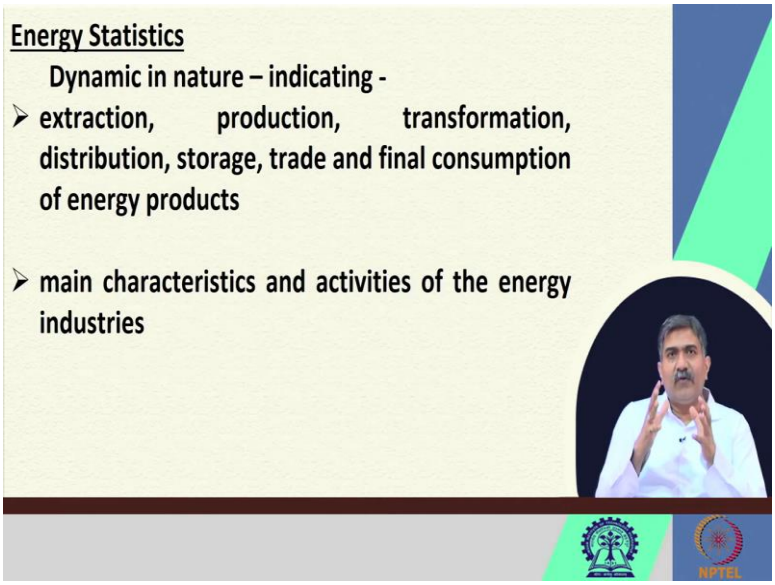

So, when you look at the statistics, you find that it is a very broad one. It is not only about generation and consumption; it is in a broad sense in terms of oil, gas, coal, renewables, lignite, and all these sources.

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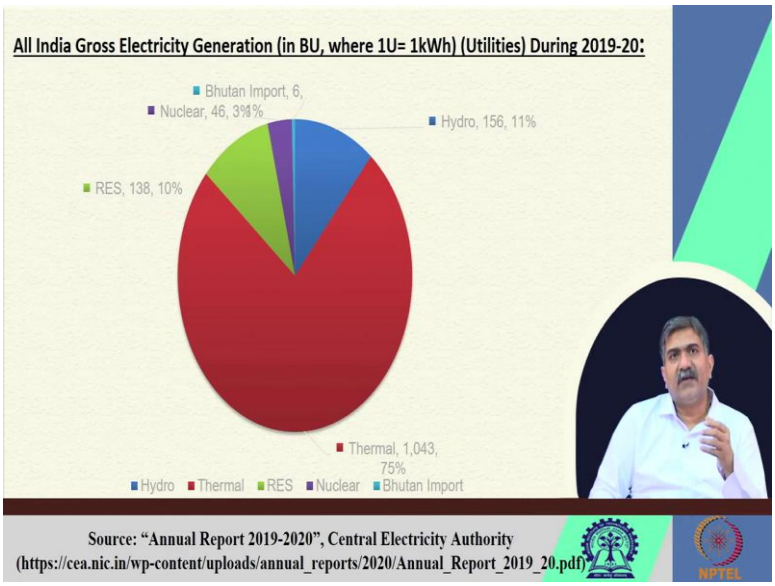

And if you look at the statistics, you will find that all India gross electricity generation in 2019-20, you would find major generation is coming from thermal, and renewable is making improvement. But then still, we are in a big way dependent upon thermal electricity, electricity coming from a thermal power plant.

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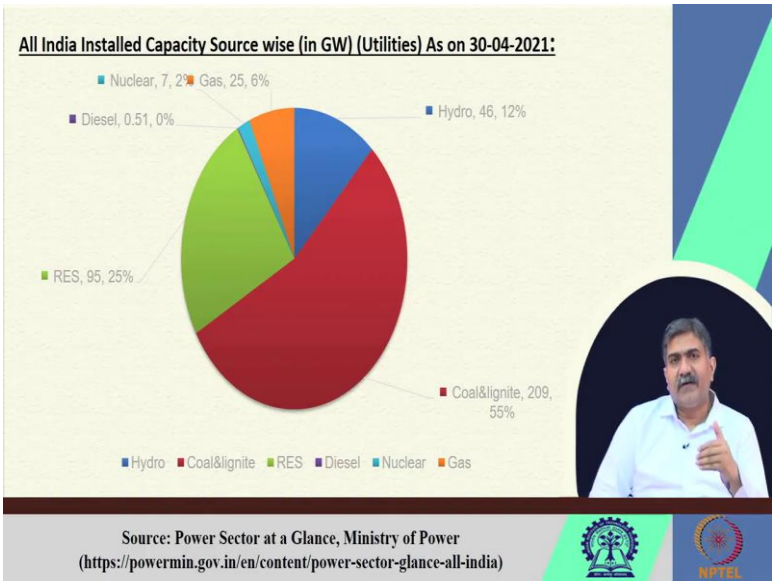

When you look at the installed capacities here again, you would find that the larger is from coal again. Renewable is doing very good, renewable as there is a steady improvement. Renewable is going to be a tough competitor for the coal-based installed capacity. In fact, if you look at the electricity plan of the government, you will find that it is suggested that new coal-based thermal power plant is not to be encouraged.

Now, in this installed capacity, nuclear is one where we also need to work. Because, if you look at the very evolution of independency in Europe, how they have become more secured on the front of energy, they have invested a lot on nuclear, though there are issues with regard to environmental degradation, with regard to the threat to human life, because of the fuel which is used in nuclear energy. But then, that can very well be addressed by very robust technological support. So, nuclear is one factor which is also to be looked at in order to minimize the dependency on coal-based electricity generation.

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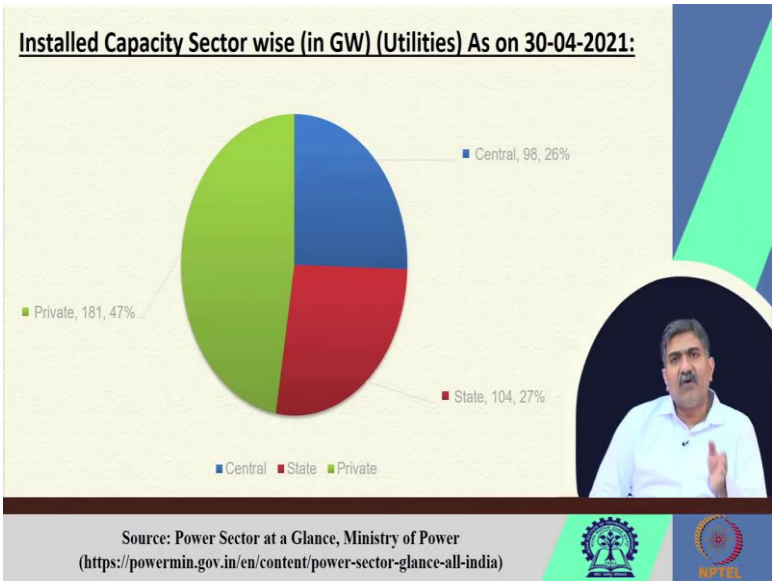

Now, installed capacity, when you look at it, you find that private participants are playing a major role, and then you have a center and the state. Now, this certainly is a result of the opening of the market. While discussing the salient features, I have suggested that one of the major reforms introduced in the sector in the 1990s was to open up the sector for the private players, and we are seeing the benefit of it. And in the coming session, when we will be discussing about generation, I will also explain that how the law has addressed to delicense generation sector.

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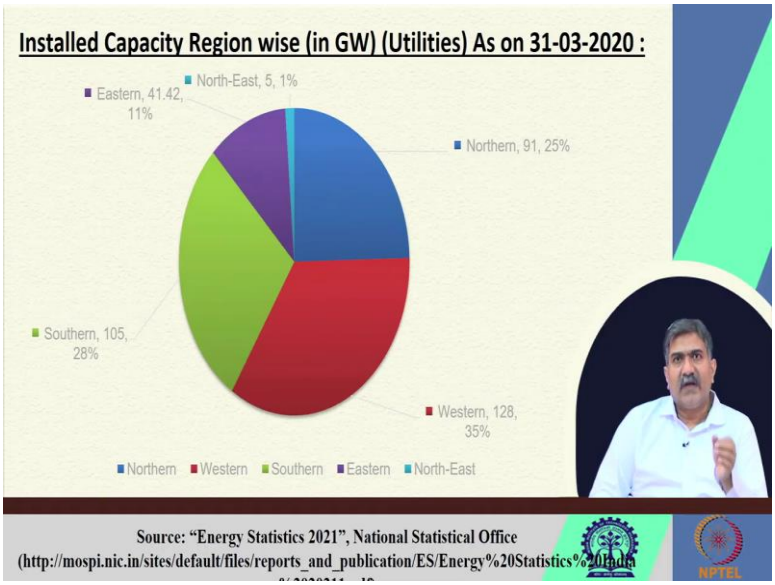

Now, when you look at the region-wise installed capacity, you would find that western, southern and northern, they are somewhere equally placed, more or less, and then eastern is

there and northwestern is there. So, you find that there is a sort of asymmetrical arrangement, and here, the one grid can play a very significant role that one nation one grid can play a significant role. So that there can be a smooth supply of electricity from one region to another region, whenever, as and when it is being demanded.

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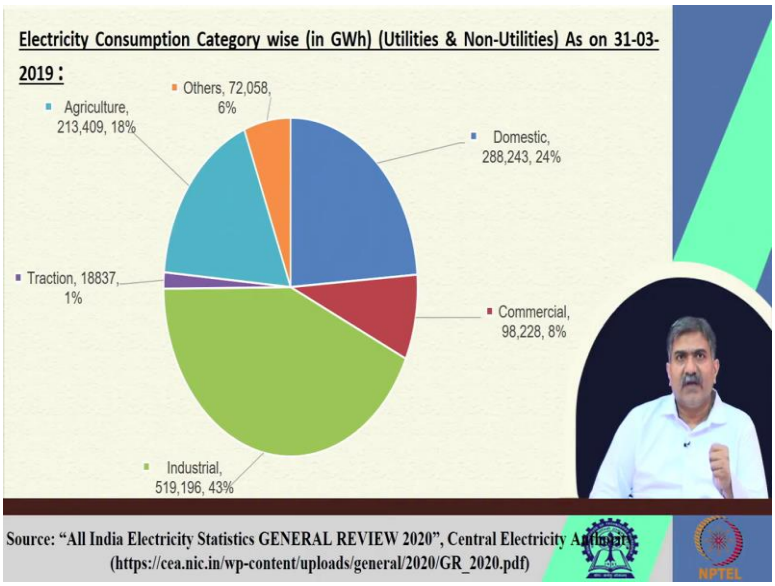

This is the electricity consumption here again. If you find industrial consumers are our largest buyers of electricity, and then you have a commercial one, domestic is again very high. And then, agriculture is one sector, which has to be looked at, because they are also consuming on a very higher side. But then, the paying ability is a factor to be taken into account when we talk about supplying electricity to farmers that what shall be the scheme for, what shall be the design for ensuring that. Because they need electricity, but at the same time, the factor of their paying ability is to be looked at.

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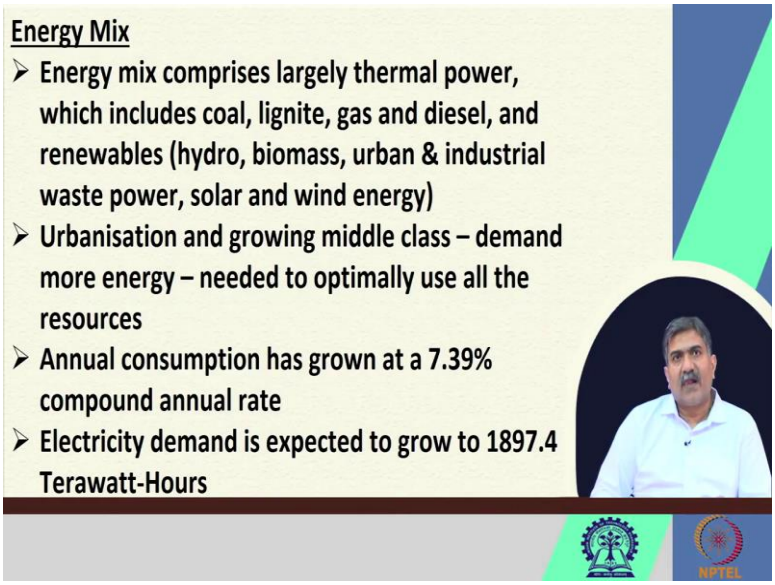

So, now come to the energy mix. As I said, we need to look into all the resources, and in that, you find conventional as well as non-conventional is there. And energy demand has grown in the last two to three decades, exponentially largely because of the urbanization happening; people are moving from rural areas to urban areas in the quest of a better life, in search of better social security. And, because of good annual economic growth, a large population is now moving from the poverty line to upper level. A good number of the middle class are being now there, and they have good purchasing power. And, with good purchasing power, they are certainly contributing to the economic growth.

Annual consumption is also growing, and electricity demand will grow. And as I said, the factors are urbanization, growing middle class, investment in manufacturing segments, investment in industry in general, the way it is happening, and the way we are taking up the agenda of electric vehicles. All these are factors which are contributing.

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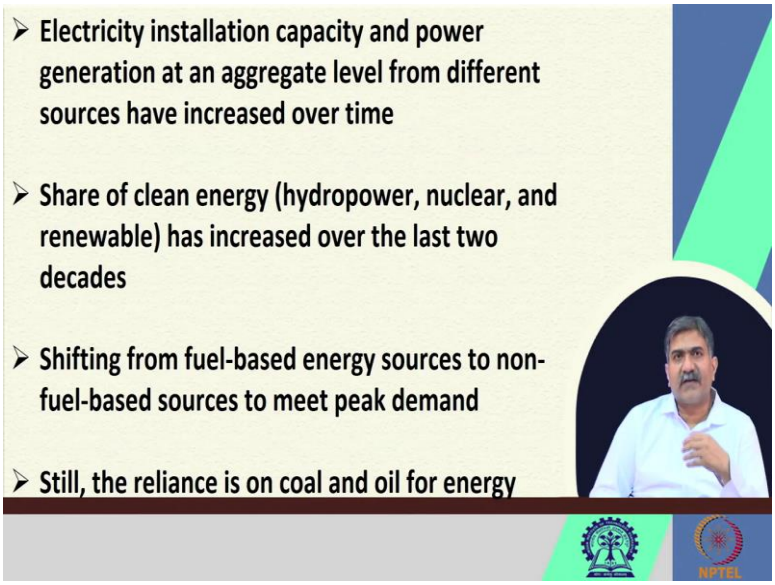

So, what is being experienced is that the installed capacity is generating, and that is from all kinds of sources and in all the regions. It is not only coal-based power that is developing and contributing. You will find that, as I had shown you earlier, renewables are also contributing in a big way.

Now, this is going to play a very significant role in the growth of the energy market. It will now bring a sort of mechanism for meeting the demand of the consumer at peak hours. Though it is true that the reliance is still more on coal for electricity and oil for energy. But then, over a period of time, renewable will also be contributing in the same quantum or maybe in a higher quantum than coal and oil.

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And this is something which is being driven not because of the policy adopted at the domestic level but also the way things are unfolding at the global level, where the world leaders are together advancing the cause of the environment. And that is why it is said that renewables are going to be a big contributor, as I said in the energy mix. And this is something which must be a priority area, and it is already a priority area when you look at the growth of renewables, even in India.

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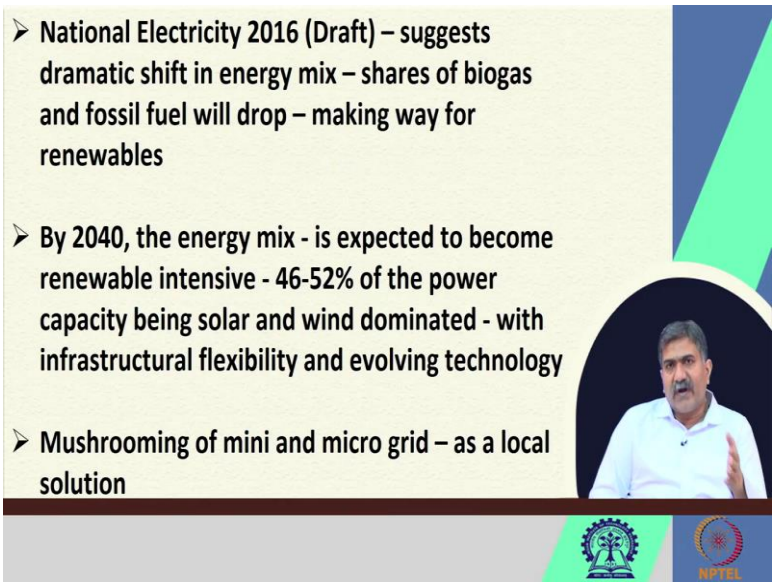

When you look at how the government perceives the energy mix in time to come, which sources would contribute in what way, and what shall be the futuristic way. 2016 draft policy, I would say this "draft", it is still under discussion electricity policy, wherein it has been suggested that let the necessary focus be on renewables. So, the lesser dependency would be there on coal which is not considered a good source of generating electricity for environmental purposes.

So, by 2040, it has been suggested that by 46 to 52 percent of the power capacity will be from renewables, particularly from solar and wind. And it can be achieved when there is necessary infrastructural development and infrastructure improvement is there. For example, how good the technical upgradation is there in the grid to connect it with renewables because we can very well make out that solar cannot continue to supply electricity in monsoon. The same is the case with the wind. So, there has to be the necessary technological improvement in order to maintain the balance in the grid.

And there is another development which is taking place, particularly in renewables, where we are finding that the consumers, they are also becoming producers of electricity. That residential society is installing rooftop solar plants, and individuals are installing solar panels. So, somewhere the idea is to promote renewables. And, if it is happening in a closer, smaller network, a smaller setup, then perhaps, mini and micro grid becomes important. This is all for today's. Thank you very much.