WEBINAR

Small Hydro Power Development Under Prevailing Conditions

April 06, 2020

Department of Hydro and Renewable Energy
Indian Institute of Technology Roorkee
Roorkee
WEBINAR
Small Hydro Power Development Under Prevailing Conditions
April 06, 2020 (Monday), 1030–1300 hrs  Moderator: Prof Arun Kumar, HRD, IIT Roorkee

PANELLISTS
1. Shri Bhavin P vaids, Joint Secretary, MNRE, New Delhi
2. Shri Chintan Shah, Director (Tech), IHSDA
3. Shri Anand Kumar, Chairman GERC, Chandigarh Nagar
4. Shri RK Joshi, CE, HPP, Ar Pr Govt, Itanagar
5. Shri Arun Sharma, President Himachal Power Assn., HP
6. Shri Sujay Shah, RPC, Pune
7. Shri PM Randa, Sr VP, Greenko, Hyderabad
8. Shri Raghuraj Gujjar, Bengaluru
9. Shri Abhishek Swarup, Andhra
10. Shri Balkrishna Bhadev, Andhra

LIKELY TOPICS FOR DISCUSSION
- Post Covid-19 SHP development scenario
- Equipment and material supply
- Construction pace including availability of manpower
- Operation and maintenance issues: automation
- Impact on cost and financial viability
- Moratorium period and loan
- Removal of difficulties in state for SHP development
- Hydro Kinetic Technology
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Programme

• 1030 hrs : Settling the connections, welcome and introduction about the webinar
• 1030 – 1110 hrs : Speakers
• 1040 hrs : Sh Bhanu P Yadav Joint Secretary and Dr P C Pant, Advisor, MNRE, New Delhi
• 1050 hrs : Mr. Chintan Shah, Director (Tech), IREDA
• 1100 hrs : Mr. Anand Kumar, Chairman, GERC, Gandhinagar
• 1110 hrs : Mr. RK Joshi, CE, DHPD, Ar Pr Govt, Itanagar
• 1120 hrs : About panellists
• 1125 – 1225 hrs : Panel discussion
  o Sh Arun Sharma, President Himalaya Power Association, HP
  o Sh Sujay Shah, MD Mahati Industries Pvt Ltd, Pune
  o Ms Manasi Sahay Thakur, Director Energy, HP Govt, Shimla
  o Sh PM Nanda, Sr VP, Greenko, Hyderabad
  o Sh Raghuraj Gujjar, Brindavan hydro projects, Bengaluru
  o Sh Abhishek Swarnkar, Andritz
  o Sh Balram Bhardwaj, Maclec
• 1225 – 1255 hrs : Q&A

Questions were raised and responded by respective speakers. More questions were received as included in this report. May be written in advance also during the presentation. Those can be targeted to particular speaker, panellist

• 1255 hrs : Summary and thanks
Webinar on Small Hydro Power Development under prevailing conditions on 06/04/2020

Prof. Arun Kumar welcomed the participants and introduced all the speakers, panellists and participants.

A. Brief description of the talks by eminent speakers

The brief description of the talks by eminent speakers are as follows.

1. Dr P C Pant, Advisor MNRE

The role of hydropower in the event of April 05, 2020 for switching off domestic load for few minutes has been acknowledged and hydro alone supported a reduction of 18000 MW out of a total reduction from 31000 MW and ramping up by 11,000 MW power in the grid when power demand started rising. The scenario of small hydropower in India was presented along with the potential across the different states. The major challenges presented to the SHP sector in India are clearances especially the environmental clearance and the cost of civil works. The major concerns regarding the SHP were also discussed with special mention to the seasonality as sufficient water is not available during the lean period. Another major concern is the quality of the DPRs. The suggestion was made to the state governments to take proactive actions in preparing quality DPR so that as soon as the bidding is done, the developer can straight away start the project.

2. Mr. Chintan Shah, Director (Technical) IREDA

He discussed impacts of Covid-19 on operation and under construction small hydropower projects. Due to such pandemic situation, a liquidity pressure is arising on stakeholders such as bankers, equity investors, developers and distribution companies etc. Particularly from a banker’s perspective, the assets earning will be skewed for next 3 months moratorium period. The Ministry of Power has provided 3 months moratorium period to distribution companies to pay generating companies and in turn generating companies cannot pay the bankers, which be a challenge for the banking sector. Based on his analysis due to impact of Covid-19 on SHPs considering the billing cycle, exercising of force majeure, delay in construction due to unavailability of labour at site, labour come-back, interest during construction and re-creation of entire supply chain etc., he stated that the moratorium period should be 3-6 months and 6-9 months for operational and under construction projects respectively. He described RBI circular on moratorium that follows “one rule fits all” policy which is advisory in nature and not compulsory for all banks/financial institutions. The circular doesn’t allow dues before March 01, 2020 to be covered. IREDA has come up with two main aspects: Firstly, they adopted moratorium policy of RBI and modified it to suite renewable energy sector. Any generator can exercise moratorium from March 01, 2020 to May 31, 2020. Secondly, project developers can borrow up to 10% of outstanding through IREDA to get over through the liquidity pressure arising due to Covid-19.
3. **Mr. Anand Kumar, Chairman, GERC**

The biggest challenge that the SHP industry will face is the liquidity i.e. the problem of cash flows. SHP is designated as must-run during the COVID-19 situation, thus the revenue generation will continue in the operational plants. The major aim should be to strike balance between the consumers and the other stakeholders. The state governments are providing the consumers with various compensation mechanism in the present situation like deferment of the fixed amount and extension of the due dates for the bills. This situation will have challenges for the DISCOM’s and the generating companies. The suggestion is that the regulators should start preparing the guidelines for the action plan for existing, under construction and upcoming renewable energy plants post COVID-19 situation. The way forward should include the decision on the basis of Force Majeure, how the different parties be compensated and the considerations over the penalties imposed by the regulators on the project developers.

4. **Mr. RK. Joshi, Chief Engineer, Deptt of HP Development, Arunachal Pradesh**

He discussed current hydro power status, pre and post covid-19 scenarios in Arunachal Pradesh. Being a rich state in terms of hydropower potential, Arunachal Pradesh has 40% of the total potential of the country but due to various issues of development the state could harnessed only 1%. However, after the commissioning of Kameng (600 MW), the harnessed potential will be 2%. The state hydropower department is currently interested to harness the untapped potential of 37 SHPs (593 MW) that are in various stages of development. He discussed various issues such as regulatory and statutory etc. Due to increase in environmental flow requirement (EFR) release and to maintain a free flow stretch of 1 km between two cascading projects, many projects have become unfeasible. The state government has received No Objection Certificate (NOC) from the state pollution control board (SPCB) for small hydropower development as a part of statutory clearances. With this ease, the state government only need to notify SPCB during development stage of any project. Recently, the state government has come up with new industrial policy w.e.f Apr 01, 2020, to encourage and promote the development of small hydropower. Due to the present pandemic situation, the roads are being blocked, the tribal areas are locked and nobody is allowed to come and go out of their areas. This is managed by different tribal groups, since there are 26 major tribes in Arunachal Pradesh.

5. **Mr. Arun Sharma, President, Himalaya Power Producers Association**

The lockdown situation due to COVID-19 has impacted all the SHP projects, operational or under-construction. The hindrance in the supply chain affects the under-construction projects as labour and the construction material are not readily available and delays in the projects are unavoidable. So, the IDC’s needs to be dealt sustainably by the policy makers so that the projects can survive. The pandemic situation does not come under any of the existing Force Majeure categories for the NPA projects, thus formulation of the guidelines and measures needs to be compiled. These guidelines should be such that they should cover the interests of current projects and the revival of the NPA projects. After the completion of the lockdown period all the stakeholders have to work together to recover the projects. The provision of the short-term loans and increasing the moratorium period to 3-6 months could be the way forward.
6. Mr. Sujay Shah, MD Mahati Industries Pvt Ltd., Pune

He defined Covid-19 as multidimensional, multifaceted and the most disruptive black swan event for SHP sector particularly in India. The project under construction stage will be more critical while the projects in early stages of development can plan for such situation. He discussed various challenges for under construction projects and categorised them in three parts i.e., Civil, Electro-Mechanical and Rupee Devaluation. In case civil works, a delay of minimum 8 months is expected assuming that the lockdown ends in mid of April 2020, after which the labour mobilization is a big challenge. Even after post monsoon due to the social distancing norms, labour might not be willing to come back to project site. In case of EM, HM & BoP works, there have been extensive disruptions in supply chains of domestic or imported vendors. He described the possible impacts on under construction projects such as delay in commercial operation date by 6 - 18 months and increased IDC. Further, suggested to mitigate the impact by investing additional equity to meet these costs. He stated that the capital expenditure would be rise by at least 8-15% for the projects under planning stage. Further there would be liquidity damages and reduction in project viability for the same. In the context of force majeure, he stated that the major affected developers are the ones who are selling under open access to Industries & which may be shut down due to lockdown.

7. Ms Manasi Sahay Thakur, Director DOE, Himachal Pradesh, Shimla

She discussed various problems associated with the energy sector of Himachal Pradesh due to Covid-19 pandemic. Since hydro sector is experiencing a slowdown in the state, the state government has already taken lot of initiatives, incentives and directed power developers to bring new initiatives. However, with this present situation to come up with solution is a challenge. She mainly focused on problems being faced in 45 SHPs (under construction stage) with a total installed capacity of 291 MW. The work is completely stopped, not even a single project is able to proceed on field. The major issues are supply chain, material movement and unavailability of labour. She mentioned that Himachal Pradesh have few revenue sources with Hydropower being a major source of revenue. But situation today is that hydro sector is completely at a standstill. However, the government is trying to get the projects started at the earliest.

8. Mr. PM. Nanda, Greenko, Hyderabad

The projects that would be impacted the most due to the COVID-19 situation are those that are near completion or have just been commissioned. The nearing completion projects have implied all their resources and are stressed by the IDC component. The recently commissioned projects are stressed by paying the loans. The delays in the payments and any costs from the DISCOM’s will affect these projects adversely. The moratorium period for the DISCOM’s and developers should be different. The developers should have longer moratorium period than the DISCOM’s. The extension of the loan repayment period to 20-21 years and accordingly the instalments of the repayments should be re-worked out, so as to benefit the recently commissioned projects. The GST waiver and other provisions should be provided to the near completion projects to reduce the CAPEX effect. In view of the upcoming projects the state governments should provide the benefits in terms of registration of land, mutation charges, forest land charges should be waived. The other important issue is the claims of the contractors
in the near commissioning projects, as they are small contractors, they would dry off with the cash flows. The developers have to put into equity to revive these contractors. The clearance and the construction period should go hand in hand in the SHP projects, so as to reduce the gestation period of the power plants.

9. Mr. Abhishek Swarnakar, Andritz

Hydropower is the key element in the grid stability and thus becomes an important grid element for sustaining wind and solar power generation. In the COVID-19 situation there is a complete shutdown in the manufacturing facility. The key issue is the operation and maintenance of the existing running SHP’s as the manufacturing of the spare parts or essential parts is not available. In the situation of the current pandemic the automation of the existing plants should be the major learning. The existing SHP’s can be made to operate automatically if the policy makers mandate it. In case of the future projects, the automation can become an integral part of the DPR’s. The automation and remote operation of the SHP is not a new thing and Andritz has a lot of experience in many countries of the world. Also, there are patent solutions in the automation, but feasibility depends on the economy of the project.

10. Mr. Raghuraj Gujjar, Kare Group, Bengaluru

He discussed current scenario of small hydropower projects in Southern India and particularly Karnataka. There is only one canal-based hydropower project of 6 MW under implementation. He described the impact of Covid-19 on the commissioned projects. The commissioned projects have to undergo annual maintenance during the months of March - May. Though the permits are being allowed for staff to visit the project, but getting all the resources at this point of time is a challenge. Having said that, he added issues related to open access projects in such lockdown situation. Since Karnataka has lot of open access projects in terms of hydropower (Approx. 400 MW) and wind power (Approx. 2000 MW), next few months going to be a big challenge if the industries don’t purchase power.

11. Mr. Balram Bhardwaj, Maclec Hydrokinetic

He discussed in details about surface hydro kinetic turbine technology. This modular technology does not require any civil structure can be installed in any flowing stream with minimum velocity 0.5 m/s and minimum depth of 0.4 m. The module size can range from 5 kW to 50 kW. The technology can be hybridized with solar energy, thereby increasing the plant load factor (PLF). The total identified potential of hydro kinetic in India is about 143 GW on total river/stream/canal network of 59,859 km. He discussed need of policy development for hydro kinetic at central and state level for grid connected distributed generation as well as off grid/captive/hybrid.

12. Mr. BP. Yadav, Joint Secretary, MNRE

The major difference between the SHP and other RE developers i.e. wind and solar is that there is a lack of interaction between the developers and the policy makers. The developers are not in touch with the policy makers, thus not able to present their problems and initiatives to the government. The developers need to develop a confidence in the policy makers regarding the SHP initiatives of the states in order to make effective policies and provide appropriate
provisions. The development of the Pumped hydro power plants is a need of hour for the sustainability of high level penetration of solar and wind energy. The higher tariffs can also be provided for pumped storage facility. The measures should be started for identifying pumped hydro power plants and assessing their feasibility.
B. Question Report

Small hydro power development under prevailing conditions

1. Some of the banks are refunding if a developer has already paid March month interest if a developer so requests. Will IREDA also refund March month interest or principal if already paid? Srinivas Movallas@gmail.com

2. "My question to Mr. Joshi : Due to this lockdown will the awarded cost of Contracts for under construction projects specifically Civil Works Contracts be re-opened to compensate the Contractors for the loss and delay which may go up to 8 to 9 months in actual." Arpit Dogra Superhydro.c@gmail.com as per contract provisions and government’s policy can be solved in the best interest of both

3. "Good Day this is Jayaraman Punidhan from NHPC. My question to the panel is: What is pampering Solar & Wind Energy and What is side lining the Small Hydropower Sector?" Jayaraman Punidhan jpunidhan@gmail.com

4. Question to Dr. Mansi Sahay Thakur: HPSEBL has not cleared February energy generation bill; which is usually paid on 30/31st of March every year. Please let us know your views. Thanks Aditya Y aditya@jalashakti.com We will definitely take up this matter with HPSEBL and try to get the payments expedited on priority. thanks you

5. Q for Mr. Joshi: What will be the impact on the construction of projects which were going to be commenced after this monsoon season? whether the GOAP will allow? Anonymous Attendee

6. "HP Government & IREDA to create a Special Funding pacakage of stalled projects against power supplies TO HPSEB advance of confirmed power supplies" Dalip Dua dalipdua@krishnahydro.in

7. "To MNRE: Request to advise the concerned to waive the Water Year which is coming to an end on 31st May in Karnataka for the current year in view of the energy which is in Banking cannot be wheeled due to the lockdown.

We also request you to release the Subsidy which is pending from a very long time. M G Balaji, Founder CMD, We have to take it up with KERC and Energy department in the state.

8. This is not the time to discuss about Andritz capabilities. Request to discuss issues related to projects affected due to covid" Srinivas M Movallas@gmail.com

9. "In Indian scenario especially in hilly regions development of Small Hydro Projects is tough due to comparatively higher project cost and limited financial resources in view of allowable tariff for SHPs. Now in view of recent lock down due to Covid 19 financial for SHP’s will detoriate further which will require financial support from the Government to
move ahead with project implementation. Kindly inform whether GoI is considering any relaxation to promote development of SHPs.

We suggest for following measures for development of SHPs.

" S C Baluni dp.ujvn1@gmail.com

10. "Earlier MNRE’s was supporting development of SHP’s under “Implementation of Small Hydro Power Programme” dated 2nd July 2014. In the above policy there was a provision of grant of Rs 7.5 crore/MW subject to maximum of Rs 20 crore for implementation of SHPs. This policy has been expired on 31.03.2017 and since then no policy announced.

Now a days cost per MW for SHP is around 12-13 Crore and GoI grant is essential to support development of SHP’s. In view of post Covid-19 scenario this is high time to give healthy financial support through GoI grant for small hydro project under development and also SHP’s to be developed in near future.

MNRE is requested to expedite issuance of policy with healthy financial support of GoI through grant to support development of SHP’s under construction as well as under development." Ajay Patel patelajay266@gmail.com

11. Kind Attn: MNRE Anit Amoli anit_gbpec@yahoo.co.in "We suggest for following measures for development of SHPs.

Earlier MNRE’s was supporting development of SHP’s under “Implementation of Small Hydro Power Programme” dated 2nd July 2014. In the above policy there was a provision of grant of Rs 7.5 crore/MW subject to maximum of Rs 20 crore for implementation of SHPs. This policy has been expired on 31.03.2017 and since then no policy announced.

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MNRE is requested to expedite issuance of policy with healthy financial support of GoI through grant to support development of SHP’s under construction as well as under development." Anit Amoli anit_gbpec@yahoo.co.in

12. MNRE: 2: Small Hydro Power Projects in hilly areas involves huge investment in flood protection and hill slope protection thus adversely affecting financial viability of project. Therefore special additional financial support via GoI grant should be allowed for SHP’s in hilly states. Anit Amoli anit_gbpec@yahoo.co.in

13. "Government is emphasizing for development of Solar projects wherein most of the raw material is being imported. Small Hydro Projects can be developed indigenously due to availability of construction material as well as technology. Development of solar projects
in conjunction with SHP’s can help effective sustainable development and small storage of few hours can help to mitigate the power availability in times when solar is not available." Anit Amoli anit_gbpec@yahoo.co.in

14. "Hydropower including power from Small Hydro Projects is established as green energy therefore specially for Small Hydro Projects suitable provision need to be included for ease of transfer of forest land for non forest land. Such projects should also be allowed in Eco sensitive zones and buffer zone also as these projects hardly have any adverse affect post construction and the environment in the project area is retrieved to its original status in next 2 to 3 years if efforts are made for the same." Anit Amoli anit_gbpec@yahoo.co.in

15. "In view of the recent Hydro Policy development of infrastructure near the project site e.g. construction of road/bridge 33kV supply line etc. should also be supported by MNRE." Anit Amoli anit_gbpec@yahoo.co.in

16. On the hydrokinetic turbines. Dinesh Kumar A N dinesh2004@gmail.com. We in energy Management centre had done a bit on hydrokinetic projects and implemented one project. Dinesh Kumar A N dinesh2004@gmail.com

17. Can we reduce the repayment time to minimize the tariff. Kumar kanishk kanishk.cool621@gmail.com

18. "The following are the observations regarding Maclec SHK Turbines. This machine is may be utilised in tidal currents as well. But the plant life of 40 years as proposed is questionable. The machine may deliver up to 75% PLF if provided in rivers with regular flow. The turbine is of floating type and it requires very minimal civil works. The only requirement for installation is suitable anchoring. This turbines are scalable and can be used for both on grid and off grid systems. It is also suitable for rural electrification purposes if streams are available nearby." Dinesh Kumar A N dinesh2004@gmail.com

19. "Mr. Abhishek Swarnkar of Andritz we in Kerala don't see your presence during tendering of HEP. Biju Viswam KSEBL." Biju Viswam bijuviswam@gmail.com

20. "It is clear that the operational principle of this turbines are similar to that of undershot water wheels. Other such models are also available elsewhere with the same principle of operation. Specialities of this turbine in comparison with others is not clear. The estimated break even time for the project using this type of turbine is not clear. They have provided the power potential estimate and economic feasibility but they have not provided the calculations. Even though they have claimed the power potential (1 kW to 500 kW) they have not provided its performance curve velocity vs power or velocity vs power density. With these curves only we can ascertain how much power or energy can be generated from a stream of which the velocity is known.

In Kerala there are few locations available in various rivers channels and tail races having the velocity of this range where there is a potential" Dinesh Kumar A N dinesh2004@gmail.com
21. "MNRE to plan: HP Government & IREDA to create a special funding package of stalled construction projects near completion or effected by force majeure against power supplies to hpseb advance of confirmed power supplies. Support existing lenders important to fight npa's in SHP" Dalip Dua dalipdua@krishnahydro.in

Chat:

From Prakash Saraogi to Everyone: 10:50 AM
West Bengal has no protential ?
sir I am not able to connect to face time connect us able me
Sir we have 3 MW SHP in Darjeeling My question is related to outages and disruption by local of generation we are facing problem of Grid Outages which is not paid by WBSEDCL it is more than by 15-20% during Monsoon the peak season and also we lost generation due to Disruption at times due to political unrest and Local problems. We had forced shut down of the plant on many occasion during 2017-19 loosing upto 60% of generation but. We did not get any support from any quarter. There must be some guidelines for Grid outage and for disruption of generation due to turmoils etc.

From Biju Viswam to Everyone: 10:53 AM
Yes

From Chintan Shah, Director (Tech), IREDA to Everyone: 11:21 AM
I would have to step out for another meeting. You may like to send your queries/comments to Prof Arun Kumar, I will try to address it

From Manasi Sahay, Director, Energy Deptt, Shimla to Everyone: 12:18 PM
I will have to leave since I have another meeting. Thank you very much everyone.

From Biju Viswam to Everyone: 12:51 PM
Mr. Abhishek Swarnkar of Andritz, we in Kerala don't see your presence during tendering of HEP. Biju viswam KSEBL.

C. Issues / suggestions with regard to existing SHP received before the webinar start On April 06, 2020

Sh SV Dinkar, Pune

1. How the cost of power generation from SHP be reduced to compete with solar power?

2. Upfront charges for use of existing water channel and gates to the developer to the extent of Rs 50 lakhs per MW need to be reviewed and removed as these structures were built by state water resources department at the time of construction of dam and are for regulating the water outlets for irrigation canals.

3. In some of the projects dam overflow is regular feature during monsoon. But generation from SHP is not allowed until the overflow actually takes place. Overflow
is very large and SHP plant discharge is only 10 -15% of overflow. Based on assessment of rainfall /inflow water may be allowed to be used for power generation

4. Charges by DISCOM for higher PF penalty. SHP to maintain PF to 0.866 but do not pay kVARH fed into the system. Payment is on basis of kWh only.

5. Adding a small solar plant at site (when possible) if land is available developer not allowed to feed the power in the same infrastructure (power evacuation arrangement) but asked to put up separate s/s and line.

6. A hybrid system of hydro and solar will be a balanced and cost effective, and developers will be willing to take up SHP.

7. Promote /create interest in SHP development MNRE may start Annual Award for SHP in India in various areas: (a) Best performing in O&M. (all parameters), (b) Best safety practices, (c) Best construction and (d) Best management.

8. Hydro Kinetic Turbine- Can a registry be made available to the designers, consultants and developers with details about potential sites daily hydrology (channel geometry) suitable for the hydro kinetic technology

9. To recommend to GoI & State Governments to reduce the taxes on equipment & material supply for the all the hydro machinery items manufactured in India including control electronics and for basic items like the permanent magnets.

Sh Santosh Saxena

1. Does Covid 19 will effect the Loan interest rate for new developer? Does it will increase?

2. Just a thought for decreasing the cost of E&M equipments. Like in Europe Indian developers should encourage to split the contracts in mechanical and electrical package.

3. Design integration can be separate contract with E&M supplier. But somehow it has not get implemented, just because of providing "One stop solution".

4. In Nepal - As you are very well aware that common persons can invest in hydro project based on his capability. Can in India, is it possible? If No than why.

Sh Suresh Chandra Baluni, Director (Project), UJVN Limited.

We suggest for following measures for development of SHPs.

1. Earlier MNRE’s was supporting development of SHP’s under “Implementation of Small Hydro Power Programme” dated 2nd July 2014. In the above policy, there was a provision of grant of Rs 7.5 crore/MW subject to maximum of Rs 20 crore for implementation of SHPs. This policy has been expired on 31.03.2017 and since then no policy announced.

Now a days cost per MW for SHP is around 12-13 Crore, and GoI grant is essential to support development of SHP’s. In view of post Covid-19 scenario, this is high
time to give healthy financial support through GoI grant for small hydro project under development and also SHP’s to be developed in near future.

MNRE is requested to expedite issuance of policy with healthy financial support of GoI through grant to support development of SHP’s under construction as well as under development.

2. Small Hydro Power Projects in hilly areas involves huge investment in flood protection and hill slope protection thus adversely affecting financial viability of project. Therefore special additional financial support via GoI grant should be allowed for SHP’s in hilly states.

3. Government is emphasizing for development of Solar projects, wherein most of the raw material is being imported. Small Hydro Projects can be developed indigenously due to availability of construction material as well as technology. Development of solar projects in conjunction with SHP’s can help effective sustainable development and small storage of few hours can help to mitigate the power availability in times when solar is not available.

4. Hydropower including power from Small Hydro Projects is established as green energy, therefore specially for Small Hydro Projects suitable provision need to be included for ease of transfer of forest land for non forest land. Such projects should also be allowed in Eco sensitive zones and buffer zone also as these projects hardly have any adverse affect post construction and the environment in the project area is retrieved to its original status in next 2 to 3 years if efforts are made for the same.

5. In view of the recent Hydro Policy, development of infrastructure near the project site e.g. construction of road/bridge, 33kV supply line etc. should also be supported by MNRE.

D. Coverage by each speaker and panellist

Speakers and Panellists

1. Sh Bhanu P Yadav, Joint Secretary, MNRE, New Delhi (yadavbp@cag.gov.in)
   - General Indian scenario of shp development,
   - different steps being taken by state government,
   - post Covid scenario for shp development and MNRE thinking
   - competitions with solar, wind and thermal energy in terms of cost of power
   - distinct features of shp and challenges

2. Sh Chintan Shah, Director (Tech), IREDA (cnshah@ireda.in)
   - Post Covid financing issues
   - Moratorium period and loan repayment
   - Increased project cost
   - PPAs- force majeure especially for payment from buyers

3. Sh Anand Kumar, Chairman, GERC, Gandhinagar (devinaanand@gmail.com)
   - Post Covid Regulatory issues
   - Increased project cost
- Reduced power needs and PPAs-Force majeure especially for payment from buyers
- Reduced subsidy due fiscal deficit with governments

4. Sh RK Joshi, CE, HPD, Ar Pr Govt, Itanagar (rkjoshintl@gmail.com)
   - Difficulties being faced by project developers in the state - (construction power, power evacuation, land availability, accessibility)
   - Removal of difficulties in state for shp development
   - Power evacuation- possible reduction in financial support by the governments
   - Apprehensive environment especially for labour and expertise man power

Panellists for discussions

5. Sh Arun Sharma, President Himalaya Power Association, HP (arunsharma5000@rediffmail.com)
   - Difficulties envisaged in executing the new and ongoing projects
   - Force majeure conditions from Discoms in terms of payment
   - Likely increase in project cost, higher tariff
   - Competitions with solar and wind but having other measurable advantages

6. Sh Sujay Shah, EPC, Pune (sujay@mahati.com)
   - Difficulties envisaged in executing the new and ongoing projects
   - Force majeure conditions from Discoms in terms of payment
   - Likely increase in project cost including spares due to higher dollar and higher material and labour input cost, higher tariff

7. Ms Manasi Sahay Thakur, Director Energy, HP Govt, Shimla (manasisahay@gmail.com)

8. Sh PM Nanda, SrVP, Greenko, Hyderabad (nanda.pm@greenkogroup.com)
   - Difficulties envisaged in executing the new and ongoing projects
   - Difficulties envisaged in operating the plants especially in terms of delayed parts availability, manpower and payments from power buyers
   - Likely increase in project cost, higher tariff, impact on PPAs
   - Increased automation to reduce Operation cost and enhancing reliability

9. Sh Raghuraj Gujjar, Bengaluru (gujjar.r@kare.group)
   - Reduced tariff by SERC on account of increased RPO from solar
   - Financing issues, delayed repayment

10. Andritz (sanjev.handoo@andritz.com)
    - Availability of machines, spare parts, manpower due to disturbances
    - Impact of Higher dollar
    - Increased automations for reduced operating manpower

11. Sh Balram Bhardwaj (contect@maclec.com)
    - hydro kinetic technology
    - Potential
    - Cost, doability, permission, grid connectivity
### E. Attendee

Small hydro power development under prevailing conditions

#### Panellist Details

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<th>User Name</th>
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<td>Rajesh Kumar</td>
<td>Sharma</td>
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<tr>
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<td>Singh</td>
<td><a href="mailto:bhanu@bhavanipower.com">bhanu@bhavanipower.com</a></td>
</tr>
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</table>

F. Some snapshots of the webinar
Challenges observed in the sector

- Long time taken for clearances
- Rise in project cost
  - Benchmark cost recommended by AHEC for 2018 is Rs 11.11 cr/MW
  - Against 2005 Benchmark cost of Rs 7.45 cr/MW
- Short working season in hilly areas
- Resulting to cost and time overrun
- Role factor in financing
  - Long project cycle
- Unwillingness of DISCOMs to sign PPAs with higher tariffs SHP projects
- Levy of Interstate Charges
- Non-availability of Trained Manpower for O & M
  - at local level

Issues related to RBI circular on moratorium: RE sector

- RBI circular is under the “one rule fits all” policy (mostly for retail loans)
- The circular is of advisory nature, and not compulsory for all banks/FIs to follow
- Banks/FIs needs to have their board approved policy to follow RBI circular
- Circular doesn’t allow any dues before 1st March, 2020 to be covered
Post COVID19 Regulatory Framework

Anand Kumar

- Chairperson of the Gujarat Electricity Regulatory Commission (GERC) in April 2016, served as Chairperson of Regulatory body of Meghalaya State for 5 years.
- Vice Chairman of the Forum of Regulators and Forum of Indian Regulator and
- Member of the State Advisory Board of Apex body of Auditors.
- Out of 39 years’ experience in Indian Power Sector, 24 years in Reforms, Restructuring & Regulations in four States Regulatory Commissions in India.

Developer’s Difficulties

1. Significant economic disruptions
2. Construction local workers are staying away from work sites
3. Construction work stopped owing to total lockdown
4. Supply chain of equipment & material interrupted;
5. Commissioning / completion of projects are likely to be delayed
6. Projects face cost escalation
7. Most of the labour forces have left for their home state
8. Uncertainty prevails on their return to the project site;
Covid-19 Impact

The impact of Coronavirus Pandemic is multidimensional and multifaceted especially for capital and services intensive sector like Small Hydro. This is the most disruptive black swan event for SHP sector and particularly in India.

This event is even more stressful for projects under construction which are midway in the execution.

The challenges are summarised as below.
AUTOMATION FUTURE IN HYDRO PROJECTS

Advantages & Support

✓ Short reaction time in case of system outage
✓ No journeys required for fault analysis and repair

✓ Minimization of system down times
  • No travelling time
  • No travelling costs
  • Minimal administrative work

✓ The global presence of our experts ensures optimal availability of technicians 24x7.
Small Hydro Power Development under prevailing Conditions

Reduced Tariff and Financing Issues

By C.A. Raghuraj Gujar,
Managing Director,
Brindavan Hydropower Private Limited, Bengaluru.


Managing Director & CEO KARE group for their renewable energy initiative:
- 24.75 MW Tungabhadra NH5, on Krishna River (in Karnataka) - KARE Power Resources Pvt. Ltd.
- 24 MW Tunga NH5, on Tunga river at the foot of Gajurum dam - at Shimoga Karnataka
- 1.5 MW Anveer NH5, on Bhadra river, Anveer Branch Canal, near Shimoga - Karnataka
- Vice President of RENEWABLE Energy Developers' Association of Karnataka
- Director on the Board of Lakshmi Vilas Bank Ltd., a listed Scheduled Private Sector Bank, based out of Karur.
**Value Proposition**

- **Saving**
  - As Replacement of Diesel Pumps for irrigation, it can reduce per acre production cost of farmers by 20%.

- **Yield**
  - Generate Power 24x7 24x7
  - Velocity Max.

- **Scale**
  - Length & Width 1 unit to infinite

- **PLF**
  - ~90% PLF
  - Minimize impact of flow/discharge/water level fluctuations

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**2D Layout of 5 kW Modules Installation Plan in Arrays**

(Velocity ~ 1.5 m/sec, Width ~ 15 m, Depth ~ 2m, Length ~ 100 m)

Source: IEP 2018

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**Utilities**

- **Energy Independence**
  - Provide enough electricity to fulfill energy requirements 24x7 from any in-stream water body
  - Reduce import of electricity, maintain grid balance

- **Water Resource Management**
  - Pump water from source to consumers at lowest cost & eliminate water scarcity
Annexure