

## Chapter-6

### Status of Under Execution Hydro Electric Projects (above 25 MW) in the Country (Oct ~ Dec 2017)

Sl. No.	Name of Project Executing Agency Date of CEA clearance / Approval Capacity (MW) Broad Features Cost (original/latest) In Rs. Crores.	State Comm. Sch. (original/ Now Ant.	Broad Present Status / Critical Area	Remarks/ Critical issues
(i)	<b>Projects Commissioned during 2017-18</b>			
	<b>Central Sector</b>			
1.	<b>Tuiri</b> NEEPCO Revised CCEA 14.01.2011 2x30= 60 MW <b>Broad Features:</b> Dam: Earthfill, L – 250 M H – 75 M Diversion Tunnel: Partly circular & partly modified horse shoe Diameter Diverted concrete portion 6 M steel liner portion 6M, 5.6 M & 3.6 M Power tunnel: Concrete Portion – 200 M Steel Liner Portion – 140M, 80M & 2.30 M <b>Cost:</b> <u>Original:368.72</u> Latest: 1329.43	<u>Mizoram</u>  <u>2006-07</u> <u>2017-18</u> (Nov'17)	<b>Unit # 1 – Commissioned on 25.08.2017.</b> <b>Unit # 2 – Commissioned on 28.11.2017.</b>	- <b>Commissioned</b>
	<b>State Sector</b>			
2.	<b>New Umtru</b> MePGCL, 2x20=40 <b>Broad Features:</b> Diversion Structure- Gated structure (FRL- 130.1m, MDDL-123.3m) HRT- 5m dia, 750m long P.House- Deep Set SWYD- 132 kV <b>Cost:</b> <u>Original: 226.40</u> Latest : 599.00	<u>Meghalaya</u>  <u>2011-12</u> <u>2017-18</u>	<b>Unit # 1 : Commissioned on 22.04.2017.</b> <b>Unit # 2 : Commissioned on 30.06.2017.</b>	- <b>Commissioned</b>
3.	<b>Sainj</b> H.P. Power Corpn. Ltd. 2 X50=100 MW 29.12.2010 <b>Cost:</b> <u>Original 784.56</u> Latest 784.56	<u>H.P.</u>  <u>2014-15</u> <u>2017-18</u>	<b>Unit # 1: Commissioned on 04.09.2017.</b> <b>Unit # 2: Commissioned on 04.09.2017.</b>	- <b>Commissioned</b>
4.	<b>Pulichintala</b> TSGENCO 120 MW (4x30 MW) <b>(3 Unit Comm.)</b> 25.04.2007 <b>Broad Features:</b> Design Head: 24 M Power House: Surface Turbine : V. Kaplan Annual Energy: 220 MU <b>Cost:</b> <u>Original: 380.00</u> Latest: 563.49	<u>Telangana</u>  <u>2009-11</u> <u>2018-19</u> (Aug,18)	<b>Unit #1: Commissioned on 25.09.2016</b> <b>Unit #2: Commissioned on 26.10.2017</b> <b>Unit #3: Commissioned on 01.11.2017.</b> <b>Unit#4:</b> Unit rotated, Commissioning subject to availability of water.	- <b>Partially Commissioned</b>

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<b>Private Sector</b>				
5.	<b>Dikchu</b> Sneha Kinetic Power Projects Pvt. Ltd. 21.10.2011 2x48= 96 MW <b>Broad Features :</b> Dam-35m High, Concrete Gravity HRT-4m dia &4.6 km length Circular. Surge Shaft- 65m High & 9m dia. P.House-Underground Turbine-Vertical Francis TRT-4m dia & 1000m length Swityard- 60mx30m size <b>Cost : Original :639.57</b> Latest : 1140.00	<u>Sikkim</u>  <u>2013-14</u> 2017-18	<b>Unit #1: Commissioned on 11.04.2017.</b> <b>Unit #2: Commissioned on 12.04.2017.</b>	- <b>Commissioned</b>
6.	<b>Chanju-I</b> M/s IA Energy 24.04.2010 3x12=36 MW <b>Cost :Original : 295.09</b> Latest : 295.09	<u>H.P.</u>  <u>2014-15</u> 2017-18	<b>Unit#1: Commissioned on 17.02.2017</b> <b>Unit#2: Commissioned on 01.02.2017.</b> <b>Unit#3: Commissioned on 26.07.2017.</b>	- <b>Commissioned</b>
7.	<b>Tashiding</b> M/s Shiga Energy Pvt. Ltd. 28.03.2011 2x48.5 = 97 MW <b>Broad Features :</b> Barrage-EL 917m HRT-4.5 m dia & 5.437 km length , Surge Shaft- 61.058m Height & 8.5m dia. Penstock- Length upto Bifucation 441.53 m After bifurcation 25 m & 30 m long P.House-Surface TRT- Open Channal & 78.5 m length. Switchyard- Outdoor, 220 KV <b>Cost :Original : 465.95</b> Latest : 465.95	<u>Sikkim</u>  <u>2015-16</u> 2017-18	<b>Unit#1: Commissioned on 06.11.2017</b> <b>Unit#2: Commissioned on 06.11.2017.</b>	- <b>Commissioned</b>
<b>ii) Hydro Capacity for benefits during 2017-18 &amp; beyond.</b>				
<b>Central Sector</b>				
1	<b>Kishanganga</b> NHPC 14.01.2009 3x110 = 330 MW <b>Broad Features :</b> Dam – 37m High CFRD, HRT- 6.0m x 24 km long	<u>J&amp;K</u>  <u>2014-15</u> 2017-18 (Mar'18)	<b>Dam &amp; Intake works:-</b> Completed. <b>HRT:-</b> Excavation completed. Overt lining 177m (0.83%) is balance out of 23.30km. Invert lining 1073m (4.6%) is balance out of 23.30km. <b>Surge Shaft:-</b> Concreting completed. <b>Pressure Shaft liner:-</b> Almost completed. <b>Power House:-</b> Concreting completed. <b>E&amp;M:- Unit # 1:</b> Boxed up.	-Completion of Power evacuation arrangement. (PGCIL)

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	S.Shaft-17.75 dia x 104m Height P.House- Underground 113mx 21m x 45.5m. Turbine- Pelton wheel Swyd.- 220 kV <b>Cost:</b> <u>Original:3642.04</u> Latest: 5882.01 (01/17 PL)		<b>Unit # 2:</b> Boxed up. <b>Unit # 3:</b> Stator lowered & rotor likely to be lowered shortly. <b>Switchyard</b> - (Total Tower Foundation – 45, Completed- 38), (Equipment Foundation – 166, Completed – 121) <b>Associated Transmission System</b> - There are two D/C lines for evacuation of power from Kishanganga HEP. The first line is Kishanganga - Amargarh 220 kV D/C line which is being executed by PGCIL consists of 84 ckm and having 150 Tower Locations. A total of 148 foundations have been completed and 139 Towers erected and 56ckm stringing completed. The second line is Kishanganga - Wagoora 220 kV D/C line which is also being executed by PGCIL and consists of 228 ckm & 252 Tower Location. A total of 187 foundations have been completed and 102 Towers erected and 19ckm stringing completed.  <b>Critical Area:</b> HRT, Switchyard and Associated Transmission works.	
2	<b>Parbati-II</b> NHPC 11.09.2002 4x200 = 800 MW <b>Broad Features :</b> Dam – 85m High, 109. m long at top, concrete gravity type HRT- 6m x 31.23km P.House- Surface 23.5mx 39.7mx 123m. Turbine- Pelton Swyd.- 13.8/400 kV <b>Cost:</b> <u>Original:3919.59</u> Latest: 8398.75 (03/15 PL)	<u>H.P.</u>  <u>2009-10</u> <u>2021-22</u> (Dec'21)	<b>Dam &amp; Intake Structure-</b> Concreting completed. <b>Head Race Tunnel-</b> 27642 m Excavation out of 31525m completed <b>Total Overt lining:</b> 25367 m lining out of 31525 m completed. <b>Power House:</b> Concreting completed. <b>Jiwa Nallah Feeder Tunnel:</b> Completed. <b>E&amp;M Works:</b> <b>Unit # 1 &amp; 2 :</b> Boxed up and spun on 31.3.17 and 9.4.17 respectively using water of Jiwa Nallah. Unit#1 synchronised with grid on 29.07.2017 on partial load. <b>Unit # 3:</b> Boxed up. <b>Unit # 4:</b> Stator and Rotor lowered. Boxing up is in progress. <b>HM Works:</b> About 85% works completed. <b>Critical Area:</b> HRT.	Poor geology in HRT especially in Face-4 (TBM-Face).
3	<b>Tapovan Vishnugad</b> NTPC 11.08.2004/Nov, 2006 4x130 = 520 MW <b>Broad Features :</b> Barrage-5 bays of 12m HRT- 5.4m x 11.97km P.House- underground Turbine- V.Pelton <b>Cost:</b> <u>Original: 2978.48</u> Latest: 3846.30	<u>Uttara khand</u>  <u>2012-13</u> <u>2019-20</u> (Mar'20)	River diversion achieved on 13.04.2013 <b>Barrage:</b> Excavation completed and Concreting 109946 cum out of 125575 cum completed. <b>HRT:</b> 7651.5 m excavation completed out of 12087.9 m, TBM struck due to cavity (5.5km completed out of 8.8km) <b>PH Cavern:</b> Excavation and concreting completed. <b>Desilting Chamber &amp; Intake:</b> 4.59 lakhs m <sup>3</sup> out of 6.42 lakh m <sup>3</sup> Excavation completed. <b>TRT:</b> Excavation completed. <b>Surge shaft:</b> Excavation & Lining completed. <b>Penstock:</b> Excavation completed and Lining of 794 m out of 1372 m completed. <b>E&amp;M works:</b> Pit liner erection on all 4 units completed. Turbine housing erection of all 4 units completed. Erection of EOT crane in BVC & service bay completed. Unit#1, 2 & 3 - Hydro Test of Distributor Successfully completed, barrel concreting under progress. Unit #1 Stator HV test completed. Unit#2 Stator core building completed. <b>Critical : HRT</b>	- Completion of HRT. - Associated Transmission system.
4	<b>Tehri PSS,</b> THDC, 18.7.06 Nov-11 (Revised	<u>Uttara khand</u>  <u>2010-11</u>	EPC contract has been awarded on 23.06.11 with commencement date from 27.07.11. Upstream (Tehri Dam) and Downstream (Koteshwar Dam), intake and Head Race Tunnels (2 Nos.) already	- Poor Geology in under ground works of BVC, PAC, TRT, PH Cavern etc. - Law and order issues at

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	CCEA) 4x250=1000 MW <b>Broad Features :</b> Surge Shaft: U/s – 2 nos. D/s – 2 nos Power House: U/G TRT: 2, Dia 9m and Length 1070m + 1160m Turbine: VF reversible pump turbine <b>Cost: Original: 1657.60</b> Latest: 2978.86	2020-21 (Dec'20)	completed alongwith Tehri Stage-I works. <b>Surge Shafts upstream (2nos- 140m):</b> After completion of Crown slashing, widening is in progress. <b>Butterfly Valve Chamber (BVC):</b> Crown slashing with steel ribs completed. Benching work and additional stabilization work is nearing completion. <b>Penstock Assembly Chamber (PAC):</b> Crown slashing with steel ribs completed. Excavation of 1 <sup>st</sup> bench has been completed. <b>PH:</b> Underground excavation of PH 217325cum out of 236343cum completed. <b>Surge Shafts downstream (2nos):</b> After completion of excavation of Top Chamber, stabilization work for Shaft widening is in progress. <b>TRT (2 Nos- 1070m &amp; 1160m):</b> In Heading & Benching 1774.4m and 509.0m excavation has been completed respectively. <b>E&amp;M Works:</b> Manufacturing & supplies are in progress.	Asena Quarry. - Slow progress of works - Cash flow crisis with M/s. HCC.
5	<b>Lata Tapovan,</b> NTPC Aug-2012 3x57= 171 MW <b>Broad Features :</b> Barrage-14 bays of 11m each HRT- 7.51 Km, 4.7m dia P.House- underground Turbine- V.Francis <b>Cost: Original: 1527.00</b> Latest: 1527.00	<u>Uttara khand</u> <u>2017-18</u> <u>2022-23</u> (Subject to re-start of works)	Infrastructure works are almost completed. Main works to re-start after clearances from Hon 'ble Supreme Court. EPC contract for Civil & HM works awarded to M/s L&T on 17-08-2012. E&M package awarded to M/s BHEL on 07.12.12.	-Works of barrage & HRT yet to start due to protest by villagers.  -Construction work stopped vide Hon'ble Supreme Court order dated 7.5.14.
6	<b>Vishnugad Pipakoti</b> THDC 21.08. 2008 4x111= 444 MW <b>Broad Features :</b> Dam – 65m High, 89.3m long, concrete gravity HRT- 13.4 Km, 8.8m dia Horse shoe shape P. House-Underground 127mx 20.3mx 50m Turbine- Francis SWYD- 13.8/420 kV <b>Cost:Original: 2491.58</b> Latest: 2491.58	<u>Uttara khand</u> <u>2013-14</u> <u>2020-21</u> (Nov'20)	Civil and HM works awarded on 17.01.2014. E&M works awarded on 18.11.2014. Heading & Benching excavation for Diversion Tunnel completed. Cut & Cover at inlet &Outlet is under progress and Overt Lining 449.95m out of 494m completed. Excavation for de-silting Chamber 2 no. is under progress. Development for TBM platform excavation 95% has been completed. Main Access Tunnel (MAT) 407m: Excavation completed upto 397.50m. <b>HRT (13400m):</b> 227.5m completed by DBM. Construction of Adits and infrastructure works are under progress.	-Frequent disruption of works by local people. - Slow progress of works - Cash flow crisis with M/s. HCC.
7	<b>Subansiri Lower</b> NHPC 09.09.2003 8x250= 2000 MW (1000 MW in 12 <sup>th</sup> Plan) <b>Broad Features :</b> Dam –116m High, concrete gravity HRT- 8 x 9.5m x 1145m Power House- Surface Turbine- Francis SWYD- 16/400 kV <b>Cost: Original: 6285.33</b>	Arunachal Pradesh Assam  <u>2009-11</u> <u>2022-23</u> (Subject to re-start of works)	<b>Dam:</b> <b>Excavation-</b> 169441 cum completed out of 173000 cum. <b>Concreting:</b> 7.6lacs cum completed out of 19.96 lacs cum. <b>Intake Structure:</b> 261377 cum concreting completed out of 279454 cum. <b>Head Race Tunnel (I-VIII):</b> 7050 m heading excavation completed out of 7124m. 4279 m benching excavation completed out of 7124 m. 3199 m concrete overt lining completed out of 7124 m. <b>Surge Tunnels (8 nos.):</b> 3109 m heading excavation completed out of 3545 m. <b>Pressure Shaft- Vertical Pressure Shaft Slashing:</b> 199 m excavation out	- <b>Signing of MoU with State Government of Assam.</b>  - Issue of Downstream Impact Assessment & demand for stoppage of works by anti dam activists. <b>-Since 16.12.2011 works stopped due to agitation by various activists of Assam.</b>

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	Latest: 18559.49 (04/17 PL)		<p>of 384 m completed.</p> <p><b>Surface Power House:</b>  <b>Concreting:</b> 124887 cum out of 302600 cum completed.  <b>E&amp;M Works:</b>  <b>Unit #1:</b> Elbow erection (1 to 6) and Turbine stay ring and Spiral case erection completed.  <b>Unit #2:</b> Elbow erection (2 to 6) and Turbine stay ring and Spiral case erection completed.  <b>HM Works:</b>  Erection of diversion tunnel gates 23% completed.  Erection of Intake-5: 17% completed.  Erection of Intake 7 &amp; 8 – 20% completed each.  201 m pressure shaft steel liner erected out of total 1594 m.</p> <p>Work stopped since 16.12.11 due to agitation launched by various activists against construction of Subansiri Lower HE Project. In this regard, as decided in the tripartite meeting dated 06.12.13, discussions between Expert Group formed at the request of AASU (All Assam Students Union) and Experts of Govt. of India &amp; NHPC was held on 23.12.13. Last meeting between Expert Group of Assam and Experts of Govt. of India was held on 02.06.14 at Guwahati. Thereafter, meetings with Expert Group of Assam on 10.12.2014 and on 21.02.2016 &amp; 22.02.2016 with various Stakeholders of Subansiri Lower Project on 11.12.2014 were held to discuss the issues. The meetings were Co-chaired by Hon'ble MOS (I/C) for Power, Coal and New &amp; Renewable Energy and Hon'ble MOS (I/C) for Skill Development, Entrepreneurship, Youth Affairs &amp; Sports.</p> <p>As decided in stakeholders meeting on 11.12.2014, a Project oversight Committee (POC) was constituted vide MoP's OM dated 13.01.2015. Due to difference in opinion on some issues mainly seismic issues, the Expert Group of Assam has submitted the final report to MoP &amp; members of POC from Government of India have also submitted a separate report to MoP in Jan / Feb'2016.</p> <p>Matter related to Subansiri Lower HEP was being heard by Hon'ble National Green Tribunal (NGT), Kolkata. The <b>judgment has been pronounced by NGT Kolkata on 16.10.2017.</b></p> <p><i>"In this judgement, NGT has directed MOEF&amp;CC to constitute a committee of three expert members from the field of Seismology, Geology and Hydrology and one of these members shall be from Northeast to examine the entire matter and reports of various committees constituted. The Terms of Reference (TOR) of the committee will be same as made to POC as contained in OM no. 2/5/2002-NHPC dated 13.01.2005. The MOEF&amp;CC shall constitute the Committee within one month and the committee shall give its report in three months from the constitution of the committee to MOEF&amp;CC which will be placed before Expert Appraisal Committee (EAC) for appraisal under Environment Impact Assessment (EIA) Notification 2006. EAC shall complete the appraisal within 60 days and place it before the competent authority for final decision."</i></p> <p>Subsequently, MoEF&amp;CC has constituted a Committee consisting of three expert members vide order dated</p>	

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			<p>27.11.2017. The committee has to give its report within 3 months from date of issue of order. The committee hold its first meeting on 21.12.2017 &amp; 22.12.2017 at New Delhi with NHPC and members of POC of Govt. of India.</p> <p>In the meantime, the Applicant (Sh. Aabhijeet Sharma) raised objection in NGT, Kolkata on the constitution of committee by Ministry of Environment, Forest &amp; Climate Change (MoEF &amp;CC). The matter was heard by NGT, Kolkata on 10.01.2018.</p> <p>NGT directed the MoEF to consider those objections and place on record their contention on the wisdom in the continuing with the committee and directed to file an affidavit before <b>next date of hearing i.e. 07.03.2018.</b></p> <p><u>Signing of MOA with Govt. of Assam:-</u> Signing of MOA with State of Assam is pending yet. NHPC had sent the draft MOA, approved by MOP, to the States of Assam and Arunachal Pradesh in April-03 for their consent / signing of Agreement. The MOA with Arunachal Pradesh Government has already been signed on 27.1.2010.</p>	
8	<p><b>Kameng</b> NEEPCO 02 12 2004 4x150 = 600 MW <b>Broad Features:</b> Dam :Bichom-69m High, 247.3m long. Tenga – 24.4 High, 103m long. HRT- 6.7m dia, 14.45 km. High Pressure Tunnel (HPT)Total length 3.64 km Surge Shaft: 25m dia, 70m Height P.House- semi-U/G Turbine- Francis</p> <p><b>Cost:</b> Original: 2496.90 Latest: 6179.96</p>	<p>Arunachal Pradesh</p> <p><u>2009-10</u> 2017-18 (Mar,18)</p>	<p><b>Bichom Dam:</b> Excavation 764383/780000 cum and Concreting 409700/416165 cum completed.</p> <p><b>Tenga Dam:</b> Excavation and Concreting completed.</p> <p><b>HRT:</b> Excavation completed. lining nearing completion.</p> <p><b>Surge Shaft:</b> Concrete lining completed.</p> <p><b>HPT:</b> Almost completed.</p> <p><b>Power House &amp; Tail Race:</b> Excavation &amp; concreting completed.</p> <p><b>HM Works:</b> Fabrication of penstocks completed and erection of all 6 nos. radial gates is in progress.</p> <p><b>Unit erection:</b> Unit #1, 2 &amp; 3 : Boxed up. Unit#4: Rotor &amp; Stator lowered.</p> <p><b>Critical:</b> 1. Dam construction &amp; associated HM works.</p>	-Dam and associated HM works are critical.
9	<p><b>Pare</b> NEEPCO 4.12.2008 2x55 = 110 MW Broad Features: Dam : 63m High, Con. Gravity Spillway – 3 nos. gates Size of gate: 10.4m (w)X 12 m(H) Crest Level: 216 m HRT: Dia – 7.5 M Length– 2810.75M Pressure Shaft: Dia: 6.4 M Length: 220M Bifucation Penstock Dia: 4.5 M Power House: Surface P.H. Size: 68 mX 25m Type of Turbine: VF</p>	<p>Arunachal Pradesh</p> <p><u>2012-13</u> 2017-18 (Mar,18)</p>	<p><b>Civil Works:</b> <b>Dam: Excavation</b> - completed. Concreting – 186840 cum out of 193513 cum completed. <b>Head Race Tunnel:</b> Boring and Lining completed. <b>High Pressure Tunnel</b> : Boring completed. <b>Surge shaft:</b> Open excavation, boring and lining completed. <b>Power House:</b> Excavation in pit completed. Concreting almost completed.</p> <p><b>Hydro Mechanical Works:</b> Erection of steel liner – 262.75 out of 264.25 m completed. Erection of DT inlet gate completed. Out of 3 radial gates, erection of two gates on Block 6&amp;7 is in progress.</p> <p><b>Unit erection:</b> <b>Unit-1:</b> Boxed up. <b>Unit-2:</b> Boxed up.</p> <p><b>Critical:</b></p>	-Dam & associated HM works are critical.

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	TRC: Open channel 60.62 M wide 49M long Cost: Original: <u>573.99</u> Latest: 1337.76		1. Dam Concreting & Spillway Gates.	
10	<b>Ramam-III</b> NTPC Hydro Ltd. 10.09.14 3x40 = 120 MW <b>Broad Features :</b> Run of the River Scheme <b>Cost :</b> <u>Original: 1381.84</u> Latest : 1381.84	<u>West Bengal</u>  <u>2019-20</u> 2020-21 (Mar,21)	Infrastructure works are in progress. Civil & HM works of Barrage including Part HRT Package awarded to M/s Simplex –Apex JV on 10.09.14. Civil & HM works of Power House including Part HRT awarded to M/s SEW Infrastructure Ltd. on 12.12.2014. Electro-Mechanical (EM) Package awarded to M/s BHEL in Feb-2015.  First stage river diversion done on 23.03.2016. First phase Barrage excavation completed and Raft concreting started. Adits Excavation completed. Excavation of Desilting chamber completed and concrete lining works started. From 16 <sup>th</sup> June, 2017 all the works have stopped due to Gorkhaland agitation. Now after calling off the agitation, mobilization for re-start of civil works is in progress.	- Works affected due to GJMM Andolan.
	<b>State Sector</b>			
11	<b>Parnai</b> JKSPDC 21.10.2013 3x12.5= 37.5 MW <b>Broad Features:</b> Barrage: 107m Long, 11.7m High HRT: D Shape, 9236m long, 3.2m dia Surge Shaft: 3.2m Dia Power House- Surface- 60x12x28 <b>Cost:</b> <u>Original: 640.41</u> Latest 640.41	<u>J&amp;K</u>  <u>2017-18</u> 2019-20 (Mar,20)	The implementation of the project has been undertaken by awarding the EPC contract in favour of M/s. Patel Engg. Ltd. in 2013. <b>Barrage:-</b> Excavation 11724cum out of total 62187cum completed. <b>HRT (D-shaped, 3.2m diameter, 9.236km long):-</b> 1693m out of 9236m excavation completed. <b>Pressure shaft (1no. 2mdia, 1733mlong) :-</b> Excavation 3268cum out of 70,000cum completed.	- Slow progress of works - Land acquisition issues at Adit-I to HRT & Power House area.
12	<b>Lower Kalnai</b> JKSPDC 16.08.2013 2x24= 48 MW <b>Broad Features:</b> Dam: 110m Span, 49m High HRT: D Shape, 3960m long, 4m dia Surge Shaft: 14m Dia Power House- 55x23.45x32.4 <b>Cost:</b> <u>Original: 576.87</u> Latest 576.87	<u>J&amp;K</u>  <u>2017-18</u> 2020-21 (Mar'21)	EPC contract awarded to M/s. CPL in Sept., 2013. Diversion tunnel has been completed and river diversion made on 30.11.2016. Work on coffer dams has been started <b>Dam:-</b> Excavation work completed for right abutment of the dam bridge. Excavation of left abutment completed upto 50%. <b>HRT:-</b> Adit excavation is in progress. After suspending works in January, 2017, works resumed at site since 12 <sup>th</sup> April, 2017. Due to poor progress of the Contractor, JKSPDC has revoked the advance payment and the performance bank guarantee aggregating to Rs.79.21 Crores.	- Slow progress of works
13	<b>Shahpurkandi</b> Irrigation Deptt. &PSPCL 04.05.2011 3x33+3x33+1x8=206 MW <b>Cost:</b> <u>Original: 1835.50</u> Latest 1835.50 (Power Component)	<u>Punjab</u>  <u>2015-16</u> 2020-21 (Subject to re-start of works)	Civil works of Main Dam and Hydel Channel awarded and are under construction <b>Main Dam:</b> 1286552 cum Excavation out of 1981500 cum and 89286 cum concreting out of 1135295 cum completed. <b>Hydel Channel:</b> 2696210 cum excavation out of 3900000 cum and 22153 cum concreting out of 42864 cum completed. Govt. of J&K vide letter dated 24/8/2017 agreed to restart the project with certain conditions.	-Works of Dam stopped since 29.08.2014 due to inter-state dispute between states of J&K & Punjab.

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14	<b>Uhl-III</b> Beas Valley Power Corporation Ltd. (HPSEB) 19.09.02 / (TEC -2x50 MW) 3x33.3 =100 MW (Revised vide HPSEB letter dt. 19.01.07. <b>Broad Features:</b> HRT-4.15m x 8.47 km S.Shaft- 13m x 57m Penstock- 3.4m x 1860m P.House- Surface Turbine- V. Francis <b>Cost:</b> Original: 431.56 Latest: 1281.52	<u>H.P.</u>  <u>2006-07</u> 2017-18 (Mar.18)	Almost all civil works completed. Lining of main HRT completed. Grouting, cleaning and plugging works is under progress. <b>E&amp;M:-</b> All units boxed up.  <b>Critical : HRT</b>	
15	<b>Sawra Kuddu</b> H.P. Power Corpn. Ltd. Clearance: 10.11.2004 3x37= 111 MW <b>Broad Features:</b> Diversion Structure: 10.45m high Piano Key Weir. HRT- D-Shaped, 5m dia, 11.145Km long. Power House- Under ground Turbine- 500 rpm VF. Switchyard: 220 Kv. <b>Cost:</b> Original: 558.53 Latest: 1181.90	<u>H.P.</u>  <u>2011-12</u> 2019-20 (May,19)	<b>Barrage:</b> Excavation completed & concreting is under advance stage of completion. <b>HRT:</b> Excavation completed and 7028 m out of 10834 m overt lining completed. <b>Surge Shaft:</b> Excavation & Lining completed. <b>Pressure shaft:</b> Excavation & lining completed. <b>Power House:</b> Excavation completed and concreting almost completed. <b>TRT:</b> lining completed. <b>E&amp;M:</b> All units boxed up.  <b>Critical : HRT.</b>	- Works badly suffered due to encounter of poor geology in HRT. - Contractual Issues. -Contract for HRT package terminated on 9.1.14. Re-awarded in Nov' 2014 to M/s. HCC
16	<b>Shongtong Karcham</b> H.P. Power Corpn. Ltd. Clearance: 16.08.2012 3x150= 450 MW <b>Broad Features:</b> Intake Tunnel: 4 Nos. Horse shoe 6.4m dia 192 to 280m length HRT- Circular, 10.5m dia, 8096m long. Power House- Under ground Turbine- VF. Switchyard: 400 Kv. <b>Cost:</b> Original: 2807.83 Latest: 2807.83	<u>H.P.</u>  <u>2016-17</u> 2021-22 (Jan'22)	River Diversion achieved on 10.02.2017. <b>Barrage:</b> Excavation under progress. <b>HRT:</b> Excavation of HRT 3152 m out of 7712 m completed. <b>Surge shaft:</b> 58m out of 100m pilot hole completed. <b>Power House:</b> Benching of Power House cavity is in progress.  Works hampered in some portion of HRT due to re-location of Army ammunition depot. Issue is under resolution between Army, GoHP & HPPCL.  Works are stalled since 18.04.2017 due to pending payment. Further, 125 out of 171 labour / workmen have been laid off by M/s. Patel Engg. Ltd w.e.f. 18.05.2017 to 6.8.2017 which was withdrawn partially on 7.8.2017 and work has partially resumed.	-Issues with Army authorities for shifting of ammunition depot. - Slow progress of works
17	<b>Vyasi</b> UJVNL 25.10.2011 (TEC) 2x60= 120 MW <b>Broad Features:</b> Dam: Conc. Gravity H- 86m L-207.2m HRT- Circular, 7m dia, 2.7Km long. Power House- Surface Turbine- VF.	<u>Uttarakhand</u>  <u>2014-15</u> 2019-20 (Mar,20)	<b>Civil Works:</b> <b>Dam :</b> 3.192 lakh cum / 3.200 lakh cum of Excavation completed. 63008 cum out of 4.417 lakh cum of Concreting completed. <b>Diversion Channel :</b> Completed. <b>Head Race Tunnel (2.7 Km):</b> Excavation of HRT completed. 2054m Overt Lining and 1325m Invert Lining out of 2672m has been done. <b>Pressure Shaft:</b> 2391cum out of 5000cum Excavation completed. <b>Surge Shaft :</b> Excavation completed.	-Dam and E&M works are Critical. -Local issues.



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	Switchyard: 220 Kv. <b>Cost:</b> Original: 936.23 Latest: 936.23		<b>E &amp; M works :</b> Work has been awarded to BHEL. <b>Power House:</b> 252000 cum out of 270,000cum Excavation completed.	
18	<b>Koyna Left Bank PSS</b> WRD, Mah. 20.02.2004 2x40 = 80 MW <b>Broad Features:</b> Water from the existing Shivaji Sagar Lake (Koyna reservoir) is to be utilized for generation. Intake Tunnel: Dia – 7.20 M Length – 235.5 M (including Lake tap) HRT: Dia – 7.20 M Length – 80 M Penstock – 2 nos , Dia – 2.9M Length – 10 M each P.House – Underground Turbine – Reversible <b>Cost:</b> Original: 245.02 Latest: 1494.94	<u>Maha</u> <u>rasht</u>  2014-15 2019-20 (Subject to re-start of works)	<b>Civil Works:</b> Excavation of intake structure 4781 cum out of 14105 cum and lining 2485 cum out of 3381 cum completed. Excavation of Switchyard completed. Excavation of Approach tunnel & Ventilation tunnel is in progress. <b>Tail surge shaft :</b> Excavation in soft strata completed. Excavation for inclined / vertical / lateral shafts in hard rock 6448 / 9223 cum completed. <b>TRT :</b> 364 / 24003 cum excavation completed. <b>Machine Hall :</b> Underground Excavation is under progress. 22600 cum excavation out of 55050 cum completed. <b>E&amp;M works:</b> The contract for details engineering manufacturing supply, supervision erection, testing commissioning and putting into commercial use of pump turbine, generator motor and associated equipments is signed with M/s IVRCL Ltd., Pune on 16.12.2010. Further TG set has been ordered as under: Turbine/Pump: M/s Litosroj Power, Slovenia (European Union) Generator/Motor: M/s Koncar Power, Plant & Electric Traction Engineering, Croatia (European Union). EOT Crane :- Works awarded to M/s Pedvak Cranes Private Limited Hyderabad on 12.04.2013.	-Slow progress of works. -Funds constraints due to increase in Project cost. RCE under approval.
19	<b>Polavaram</b> Polavaram Project Authority 21.07.2010/ 25.02.2009 12x80= 960 MW  <b>Cost:</b> Original: 4956.39 Latest: 4956.39 (Power Component)	Andhra Pradesh 2017-18 2020-23 (Sep,22)	Pre-construction and Infrastructural works are in progress. <b>Civil Works:-</b> Civil works awarded on 01/2012-13, 02.03.2013. <b>ECRF DAM:</b> Earth work of 508.06 L.Cum /833.169L.Cum is completed. <b>SPILLWAY:</b> Earth work of 208.14 L.Cum / 162.95 L.Cum is completed & embankment of 1.345 L.Cum / 2.4907 L.Cum is also completed. <b>POWER HOUSE:</b> Earth work of 86.24 L.Cum / 117 L.Cum is completed & embankment of 9.79 L.Cum / 30 L.Cum is completed. <b>B) HM &amp; E&amp;M Works:-</b> The price bids were opened on 11.10.17. Works are likely to be awarded shortly.	- Works under progress, however there is Inter State Issue-Public hearing for construction of protective embankment to be held in Oddisha and Chhattisgarh as desired by MOEF.
20	<b>Pulichintala</b> TSGENCO 120 MW (4x30 MW) (3 Unit Comm.) 25.04.2007 <b>Broad Features:</b> Design Head: 24 M Power House: Surface Turbine : V. Kaplan Annual Energy: 220 MU <b>Cost:</b> Original: 380.00 Latest: 563.49	<u>Telengana</u>  2009-11 2018-19 (Aug,18)	<b>Dam:</b> Completed <b>Power House:</b> The excavation of power house completed and 76596 cum concreting done against 89850 cum.. <b>E&amp;M Works:</b> <b>EOT Crane:</b> Erection and testing completed for all the units. <b>Unit #1: Commissioned on 25.09.2016</b> <b>Unit #2: Commissioned on 26.10.2017</b> <b>Unit #3: Commissioned on 01.11.2017.</b> <b>Unit#4:</b> Unit boxing up is in progress.	
21	<b>Pallivasal</b> KSEB 2x30= 60 MW 31.01.2007 <b>Broad Features:</b> HRT: 3.50m X 3396m Surge Shaft: 7.0m X 49m Pressure Shaft: 2.50m	<u>Kerala</u>  2010-11 2020-21 (Dec,20)	<b>Intake structure:</b> Excavation – 28398/33492 cum completed. Leading channel of Water conductor system replaced by cut & cover/soil tunnel and accordingly intake is shifted. <b>HRT:</b> Excavation –2858/3330 m completed. Overt conc. 1634/3330 m completed. Invert Conc.. – 1637/3330 m completed. <b>Surge Tank/Forebay:</b> Exc.–7640/13400 cum. Conc.423/843 cum.	- Poor Geology. -Contractual Issues. -Works stopped by the civil contractor from 22.07.2015. Now Kerala Government has ordered on 16.01.2017 to exclude the contract from the status of foreclosure. Accordingly, KSEB decided

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	X 1019.20m Penstock: 2.nos., 1161.20m each. Power House: Surface Turbine : Pelton S.Yard: 220kV – Single bus <b>Cost:</b> Original: <u>222.00</u> Latest : 284.69		<b>Pressure Shaft:</b> Excavation completed. Fabrication of steel liner completed and erection of 96/1096 m completed. <b>Surface penstock:</b> Excavation –105204/122600 cum. Concreting- 11401/12850 cum. Fabrication completed and 1477m out of 2036m erection completed. <b>Power House:</b> Excavation completed. Concreting 3980/11225cum. <b>Tail race Channel (2 Nos.):</b> Excavation & lining completed. <b>E&amp;M Works:</b> 75% supply completed. Erection yet to start.	on 27.03.2017 to complete the project with the existing contractor and the contractor expressed their willingness to resume the remaining works of Pallivasal Extension Scheme. The mobilization of balance works of Pallivasal Scheme has been commenced on 11.04.2017.
22	<b>Thottiyar</b> KSEB 1x30 + 1x10= 40 MW 05.06.2008 <b>Broad Features:</b> Weir: 222m Long 11 blocks 7.5m height Tunnel: Circular 2.6m dia 199m long. Power House: Surface Turbine : Vertical Pelton <b>Cost:</b> Original: <u>136.79</u> Latest: 150.02	<u>Kerala</u>  <u>2012-13</u> 2020-21 (Subject to re-start of works)	<b>Civil Works:</b> <b>Weir:</b> 3258 cum excavation out of total 5850 cum and 1598 Cum concreting out of 8690 Cum completed. <b>Approach Channel &amp; Intake:</b> 3184 cum out of 9100 cum done. <b>Power Tunnel :</b> Excavation completed. <b>Power House, switchyard &amp; allied works:</b> 31390 cum excavation out of 44500 cum and 2658 cum concreting out of 15675 m done. <b>E&amp;M and HM Works:</b> Supply of equipment in progress. Erection yet to start.	-Works are stand still since 2015 due to Contractual Issues. Accordingly the contractor put forwarded a proposal for foreclosure of the project due to their financial stringency. The detailed note regarding the same was submitted to the Board and the Board has approved and directed to the authority to float the NIT for balance works.
	<b>Private Sector</b>			
23	<b>Ratle</b> Ratle Hydro Electric Project Pvt. Ltd. 19.12.2012 4x205+1x30= 850 MW <b>Broad Features :</b> Dam Height-133m Length-194.8m Spillway-Radia Gate-(5) Size-10.75x1420 m Diversion Tunnel:2 Nos., Circular (Right back) Pressure Tunnel:11m dia each. Pressure Shaft : 6.6 m each steel lined. P.House-Underground Turbine- Francis Average Gross Head-100.39m Addl. Unit(30MW) Housed in Main P.H. Cavity) Rated Head-98.9m <b>Cost :</b> Original: <u>5517.02</u> Latest : 6257 (09/2013)	<u>J&amp;K</u>  <u>2017-18</u> 2022-23 (Subject to re-start of works)	EPC Contract for Civil & HM works awarded to M/s GVK Projects & Technical Services Limited on 04.07.2013. The infrastructure works of Road & Bridges was under progress and erection of upstream Bridge completed & downstream Bridge was in progress. Works have been suspended at Project site due to frequent local disturbances since 11.07.2014. Power Development Department, GoJK have been requested to resolve the various critical issues including 1) resolving of disturbance at site 2) restoration of congenial atmosphere and 3) IWT issues for resumption of works at site.  Excavation of DT1 (298m out of 472m) & DT2 (192m out of 552m) completed.  <b>Govt. of J&amp;K, PDD have terminated PPA on 09.02.2017 and directed JKSPDC to take over the project.</b>  The State Govt. has decided to develop the project through JKSPDC. The matter is now pending adjudication before the Arbitration Tribunal constituted by the Hon'ble High court of J&K State in terms of the PPA.	- Presently works are under hold.  - Local Issues
24	<b>Sorang</b> Himachal Sorang Power corporation Ltd. June, 2006/	<u>H.P.</u>  <u>2011-12</u> 2019-20	All Civil Works completed.  Both the units are boxed up. During the filling of water conductor system in 1 <sup>st</sup> week of Nov., 2013, leakage	Repair of penstock work

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	2x50= 100 MW <b>Broad Features:</b> HRT- 1.5 km Trench Weir-59 m P.House- underground Turbine- Pelton Gross Head-626 m SWYD- 11/400 kV (GIS) <b>Cost:</b> Original: 586.00 Latest: 586.00	(Subject to re-start of works)	occurred in penstock due to cracks. Rectification work completed in April, 2015. Unit #1 synchronized with grid on 30.10.2015, however, could not be commissioned due to non-availability of rated discharge. On 18-11-2015 when Unit # 2 was under trial run, there was rupture in the surface penstock pipe. The incidence caused loss of lives and property. The compensation package and funds for repair of penstocks pipe is being worked out with the bankers.	
25	<b>Tangnu Romai-I</b> M/s Tangnu Romai Power generation 2x22= 44 MW 30.11.2007 (HPSEB) <b>Broad Features:</b> Barrage at EL ± 2555 m HRT-3.1m dia & 7.220 km length Surge Shaft- 5m dia, Top Level 2570 m & Bottom Level 2520 m Penstock- 2 m dia & 609.3 m length P.House- Surface Turbine – Vertical Francis <b>Cost:</b> Original: 255.00 Latest: 255.00	<u>H.P.</u>  <u>2014-15</u> <u>2019-20</u> (Subject to re-start of works)	Civil works awarded on 14.06.2010 to M/s Sai Urja Hydel Project (P) Ltd. <b>Barrage and Diversion Cannel:</b> 26211 cum out of 93800 cum excavation completed. <b>Desilting Chambers &amp; SFTPC:</b> Excavation completed. SFT excavation 420 / 450.66 m completed. <b>HRT:</b> 2826m out of 6300m excavation completed. <b>Power House, Switchyard &amp; Misc.:</b> 60275 m <sup>3</sup> out of 72000 m <sup>3</sup> excavation completed. In February-2015, due to land slide the steel bridge on Pabbar River, connecting Project components has been completely damaged. The restoration works are completed.	- Slow progress of works HRT critical, poor geology. - Works are stalled due to finance issues since Jan, 2015.
26	<b>Bajoli Holi</b> M/s GMR Bajoli Holi Hydro Power Pvt. Limited 31.12.2011 3x60= 180 MW <b>Broad Features</b> Dam Height-66 M Dam Length-178 M Desilting Chamber- 2 Nos. 240 Mx14.5 MX 10.8 M HRT- Length-15.538 Km., 5.6 M dia P.H. –Surface <b>Cost:</b> Original 1696.93 Latest 1696.93	<u>H.P.</u>  <u>2018-19</u> <u>2019-20</u> (Aug,19)	<b>Civil Works:</b> awarded to M/s Gammon India ltd. on 29.05.2013. <b>River :</b> diversion achieved. <b>HRT:</b> 9.5km excavation out of 16km completed. <b>Surge Shaft:</b> Excavation 72m out of 117m completed. <b>Pressure shaft:</b> 93% Excavation completed. <b>Powerhouse:</b> Excavation completed. Spiral casing of Unit-1 completed. Unit-2 – Bottom Pit Liner erection completed and Unit-3 – Draft tube erection and concreting completed.	-Slow progress of works -Poor approach roads -Transmission Line DPR clearance by HP Govt.
27	<b>Tidong-I</b> M/s NSL Tidong Power Gen. Ltd. 2x50 = 100 MW 28.07.2006 <b>Broad Features:</b> HRT–D-3.5m L- 8461 m P.H. Surface Turbine –Vertical Pelton <b>Cost:</b> Original 543.15 Latest 543.15	<u>H.P.</u>  <u>2013-14</u> <u>2018-19</u> (Subject to re-start of works)	<b>Barrage &amp; River Diversion Works:</b> Common Excavation completed and 71700.84/73409.00 open cut rock excavation completed. 32349 cum out of 37647 cum concreting done. <b>Head Regulator &amp; Desilting arrangement:</b> Common excavation completed. 8550 cum open cut rock excavation out of 10,000 cum completed. <b>HRT (8526m):</b> Excavation completed and 1879m lining completed. <b>Surge Shaft:</b> open excavation top 38313 cum / 38500 cum completed. <b>Pressure Shaft:</b> Excavation completed <b>Power house and Tail race channel-</b> 87689 cum out of 92500 cum excavation completed. 10925 cum out of 15878 cum concreting completed.	- Slow progress of works. - Transmission Line critical. - Funds constraint.

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			Works are stalled since July, 2016 due to fund constraints.	
28	<b>Phata Byung</b> M/s Lanco 06.10.2008 2x38 MW = 76 MW Broad Features: Dam – 26m high HRT- 3.2 m dia & 9.38 km length Turbine – Frances <b>Cost:</b> <u>Original:</u> 520.00 Latest : 1225.53	<u>Uttara khand</u>  <u>2012-13</u> 2019-20 (Subject to re-start of works)	<b>Dam concreting:</b> 17800/18000 cum concreting completed. <b>P.H.:</b> Excavation completed & Concreting in progress. <b>HRT:</b> Excavation almost completed. 1400 m Lining has been completed. Excavation and lining of Intake-I & Intake-II completed. <b>Pressure shaft:</b> Excavation completed & lining is under progress. <b>TRT:</b> Excavation 178/235m completed. <b>E&amp;M Works:</b> Pit liner erection of units completed. EOT Crane installed and Commissioned.	- Works severely affected due to flash floods in June, 2013.
29	<b>Singoli Bhatwari</b> M/s L&T 11.07.2008 3x33 MW = 99 MW <b>Broad Features:</b> Barrage-FRL 1017 m, MDDL 1009 m, Barrage Top 1020m HRT- 4.65m dia & 11.870m length Surge Shaft-10 m dia & 102.85 m length Pressure Shaft-One, 3.80m dia & 358m length Penstock- 3 Nos., 2.20 m dia & 34m, 42m, 48m long. P. House-Surface Turbine-Vertical Francis TRT- Open Channel, 650m length <b>Cost :</b> <u>Original :</u> 666.47 Latest : 1577.00	<u>Uttara khand</u>  <u>2012-13</u> 2018-19 (Mar,19)	<b>River diversion</b> – Completed. <b>Dam &amp; Dykes/Barrage:</b> Excavation 98983.78 / 90744 cum and concreting 53556 / 70220 cum completed. <b>HRT:</b> Excavation completed. <b>Overt Concrete Lining</b> 4321m / 11257m completed. <b>Invert Lining</b> 4178m / 11257m completed. <b>Pressure Shaft:</b> Excavation completed. <b>PH:</b> Excavation completed & concreting 20501/ 17693 cum completed. <b>Surge Tank:</b> Excavation completed. 1579 / 5349cum of concreting completed.	- Works severely affected due to flash floods in June, 2013.
30	<b>Maheshwar,</b> SMHPCL 30 12 96/ 29.9.2006 (FC) 10x40= 400 MW <b>Broad Features:</b> Dam-35m High, concrete gravity P.Shaft-10x7.82m x 52m P.House - Surface Turbine- Kaplan <b>Cost:</b> <u>Original:</u> 1569.27 Latest: 8121.00	<u>M. P.</u>  <u>2001-02</u> 2019-20 (Subject to re-start of works)	<b>Civil &amp; HM Works:</b> All major civil works completed. All 27 nos radial gates commissioned. <b>Unit Erection:</b> Unit-10: Initial spinning achieved on 14.10.2011. Unit-9 & 8: Ready for spinning. Unit-7: Guide apparatus trial assembly in progress. Unit-6: Erection of turbine embedded parts & foundation parts completed. Unit-5 to 1: Erection of units is in initial stages. <b>Works suspended since Nov-11 due to cash flow problem with developer.</b> In this regard, a high level committee under the chairmanship of Additional Chief Secretary(Finance) GoMP, was formed on 16 <sup>th</sup> Oct, 2014 to find ways to complete the project. The committee has submitted its report on 2.5.2015. The committee has recommended three scenarios for commissioning the Maheshwar Project. Under the first scenario, another attempt to compete the project with the present private developer has been envisaged. Timeline for first Scenario has elapsed (2nd August 2015) without the promoter complying with its requirements. As per second scenario, Lenders as Govt. Companies (PFC	- Completion of R&R works and E&M works. - Works held up due to Fund constraints with developer.

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			as lead lender) have acquired majority equity i.e. 51% in the SMHPCL w.e.f. 1 <sup>st</sup> June, 2016. National Company Law Tribunal (NCLT), Ahmedabad inter-alia declaring shareholding of lenders bad in law. Against the adverse order of NCLT, appeal has been filed in National Company Law Appellate Tribunal (NCLAT), New Delhi.	
31	<b>Teesta-VI</b> LANCO 27.12.2006 4x125= 500 MW <b>Broad Features:</b> Barrage: 34.27m high HRT- 2nos,13.7km long Pressure shaft: 4nos. 5.4m dia. 130m av length, TRT: 4nos 250m av length, 8.5m dia. PH- Under ground Turbine- Francis <b>Cost: Original: 3283.08</b> Latest : 7542.00	<u>Sikkim</u>  <u>2012-13</u> 2021-22 (Subject to re-start of works)	<b>Barrage and Desilting:</b> Excavation completed & concreting 98% of 380003 cum completed. <b>HRT:</b> Heading excavation 10650m and benching excavation 4270 m out of total 27505 m completed. Overt lining 1550 m completed. <b>Surge Tank:</b> Excavation completed & concreting under progress. <b>Pressure Shaft:</b> Underground excavation of 4 no. pressure shaft completed, lining of one no. pressure shaft completed, balance lining under progress. <b>HM works:</b> 2 nos. radial gates erection in bay 1&2 completed. Erection of 1 <sup>st</sup> stage embedded parts of radial gates in bay 3&4 under progress. <b>Power House:</b> Excavation completed & conc. 21945 / 44578 cum completed. Concreting to Draft Tube Liners for all the 4 nos. Units completed. Erection of spiral casing of Unit #1 completed. <b>Transformer Cavern:</b> Excavation completed & concreting 2539/7101 cum completed. <b>TRT:</b> Excavation & Lining almost completed.	- Works held up due to financial crunch with the developer.
32	<b>Rangit-IV</b> Jal Power corp. Ltd. 06.07.2007 3x40= 120 MW <b>Broad Features:</b> Dam: Concrte 44m high .HRT : D- 6.4m L- 6.5km Power House : Surface Turbine: Francis <b>Cost: Original:726.17</b> Latest : 1692.60	<u>Sikkim</u>  <u>2011-12</u> 2020-21 (Subject to re-start of works)	<b>Dam &amp; Intake works:</b> Excavation 409184 / 492775 cum completed and concreting 61045 cum out of 173229 cum completed. Excavation of road diversion tunnel has been completed. <b>HRT:</b> Excavation in progress and 3794 m out of 6488 m completed. <b>Surge Shaft:</b> Excavation has been completed & concreting yet to start. <b>Pressure Shaft:</b> Excavation of Horizontal Pressure Shaft completed. Vertical Pressure Shaft 60.5 m out of 84.7m completed. <b>Power House:</b> Excavation in Power House completed. Concreting 8565 cum out of 19900 cum completed. <b>Desilting chamber:</b> Excavation 2143 m out of 3360 m completed.	<b>Financial crunch with the developer.</b> <b>Work held up since Oct, 2013 due to fund constraints.</b>  High Power Hydro Sub Committee (HPC), Govt. of Sikkim has taken a meeting on 20.04.2017 wherein they have agreed to enhance their equity to 51% and asked Lenders, i.e. PFC to submit their proposal for making the tariff viable by giving incentives viz reducing rate of Interest, increasing payback period of loan etc so that the project work can be started early and balance works ca be completed in 3.5 years from revival of project.
33	<b>Bhasmey</b> Gati Infrastructure 2x25.5= 51 MW <b>Broad Features :</b> Dam-33.2m High, Symmetrical gravity HRT-5.3m dia &5.132 km length , Circular. Surge Shaft- 89.8m Hight & 14m dia. P.House-Outdoor	<u>Sikkim</u>  <u>2012-13</u> 2020-21 (Subject to re-start of works)	Project is in initial stage of construction. River diversion achieved. <b>Barrage:</b> 61555cum/194600cum excavation completed. <b>HRT:</b> 1670m/4460m excavation completed. <b>PH:</b> 136105 cum/185937cum excavation completed.  <b>Surge Shaft :</b> 8567cum / 22000cum Surface excavation completed.	- Slow progress of works - works stalled since Sept., 2016 due to paucity of funds.

Sl. No.	Name of Project Executing Agency Date of CEA clearance / Approval Capacity (MW) Broad Features Cost (original/latest) In Rs. Crores.	State Comm. Sch. (original/ Now Ant.	Broad Present Status / Critical Area	Remarks/ Critical issues
	Turbine-VF TRT-2 Nos, L- 50m Swityard-132/11 KV Cost :Original : 408.50 Latest : 690.30			
34	<b>Rangit-II</b> Sikkim Hydro Power Limited 10.02.2010 2x33= 66 MW <b>Broad Features :</b> Dam-47m High, Concrete Gravity HRT-3.9m dia & 4.745 km length , Surge Shaft- 65.5m High & 10m dia. Underground Pressure Shaft : 1.7 m dia & 2.5 km length. P.House-Outdoor Turbine- Pelton Vertical Swityard- GIS, 132/11KV Cost : Original : 496.44 Latest : 496.44	<u>Sikkim</u>  <u>2015-16</u> <u>2019-20</u> (Mar,20)	EPC contract awarded to M/s Coastal in February, 2012. <b>Diversión Tunnel:</b> River diversion through diversion tunnel has been achieved. <b>Dam :</b> Excavation 53100cum out of 85000cum completed. <b>HRT:</b> Excavation 512m out of 4745m completed. <b>Surge Shaft:</b> Excavation completed. Concreting 37/1667 cum done. <b>Pressure shaft:</b> Excavation of pressure shaft I - 15m out of 128m and pressure shaft II - 154m out of 377m completed <b>Power House:</b> Excavation of surface power house is being taken up.	Works are stalled due to non releasing of funds by lenders because of Power evacuation and land acquisition issues. Works restarted. A meeting with financiers were held on 23.09.2016 for release of funds. The developer was asked to submit certain document for release of funds.
35	<b>Rongnichu</b> Madhya Bharat Power Corporation Ltd. 01.10.2008 2x48= 96 MW Cost : Original : 491.32 Latest : 1187.00	<u>Sikkim</u>  <u>2014-15</u> <u>2019-20</u> (Mar,20)	The civil works have been awarded to M/s SEW Infrastructure Ltd. and E&M works to M/s Voith Hydro Power Pvt. Ltd. <b>Barrage:</b> Excavation completed & 25208/40674 cum concreting completed. <b>HRT:</b> 73% Civil Works completed. <b>Surge shaft:</b> 49m excavation out of 88m completed. <b>Pressure Shaft:</b> 97% Civil works LHPS & 48% Civil works of VPS completed. <b>Power House:</b> 14302 out of 29626.54cum of Excavation completed. 5459/22429 cum Concreting has been completed.	- Land acquisition. - Poor geology.
36	<b>Panan</b> Himagiri Hydro Energy Pvt. Ltd. 07.03.2011 4x75= 300 MW <b>Broad Features :</b> Dam-115m from deepest foundation level Desilting Chambers : Underground, 2 Size (14Lx22Wx2.5H) HRT- modified horse shoe, 6 m dia & 9549m length , Surge Shaft- 102 m High & 15m dia. Pressure Shaft : 2/4, 3.4/2.4m dia, 707.4 m-Height P.House-Surface Turbine-Vertical Francis Cost : Original: 1833.05 Latest :2491.00	<u>Sikkim</u>  <u>2018-19</u> <u>2022-23</u> (Subject to re- start of works)	Civil works awarded on 22.02.2014. Infrastructural works and geological investigations are in progress.  Starting of civil construction works in full swing was earlier held up for want of the National Board of Wild Life (NBWL) clearance. NBWL clearance obtained in December, 2015. However, there is a case challenging the Eco-Sensitive zone notification of MoEF & Climate Change in NGT. The case is disposed on 21.8.2017. The developer applied for issuance of clearance from Forest, Environment & Wild Life Management Dept., Govt. of Sikkim.	- NBWL clearance.

Sl. No.	Name of Project Executing Agency Date of CEA clearance / Approval Capacity (MW) Broad Features Cost (original/latest) In Rs. Crores.	State Comm. Sch. (original/ Now Ant.	Broad Present Status / Critical Area	Remarks/ Critical issues
37	<b>Gongri</b> Dirang Energy Pvt. Ltd. 04.02.13 2x72= 144 MW <b>Broad Features :</b> Barrage-H-29m, L-216.5m MDDL- EL 1447m Spillway-2nos. Radial Gates; 2 Nos. 10.5m x 13m Intake: EL1438m Desilting Chambers : 2 nos. (260Lx13Wx16H) HRT- modified horse shoe, 5.8 m dia & 7137m length , Surge Shaft- 92 m High & 13m dia. Pressure Shaft : 4.4m dia, 647.26m length bifurcating into 3.1m dia & 28.51m & 34.5m length P.House-Surface Turbine- Vertical Francis  <b>Cost : Original: 1436.27</b> <b>Latest :1436.27</b>	Ar. Pradesh  2016-17 2021-22  (Subje ct to re-start of works)	EPC contract for all works awarded to Patel Engineering Ltd., Mumbai on 22-11-2011. TEC accorded on 04-02-2013 & Financial closure achieved on 15-02-13. The EPC contract for E&M works has been awarded to M/s. Andritz Hydro Pvt. Ltd. <b>Consent to establish from State Pollution Control Board was issued on 19-05-2014.</b>  Barrage: 23400cum excavation out of 1.185 Lakh cum completed. Power House & Switchyard : Open Excavation 68500cum out of 2.15 Lakh cum completed.  Construction work stalled since October, 2016 due to funds constraints with developer.	-Works awarded on 22.11.2011. However, consent to establish from SPCB was issued on 19.05.2014 -Works stopped since October, 2016 due to funds constraints with developer.

### Status of Hydro Electric Projects in Bhutan

Sl. No.	Name of Project / Capacity (MW)/ Executing Agency/Date of CEA clearance / Approval / Broad Features/Commissioning Schedule	Award of works	Broad Present Status
1.	<b>Punatsangchhu-I</b> 6x200=1200 MW PHPA, Bhutan Date of TEA: 27.07.2007 Broad Features : Dam – 136m High, 279.2m long, Concrete gravity (RCC) HRT- 10m x 8.948 km Pressure Shaft: Two nos. 6.0mx482.20m each Surge Shaft: 24.5mx128.5m TRT: 10.0m x1182.20m P.House-Underground Turbine- Vertical Francis SWYD- 400 kV Commissioning Schedule: Nov' 2016 <b>Anticipated commissioning schedule : 2021-22</b>	<b>Civil Works:</b> Package-I : L&T Ltd. on 27.03.2009 Package-II: Gammon India Ltd on 27.03.2009 Package-III:HCC ltd. 27.03.09 <b>E&amp;M Main Works:</b> Package-I : BHEL Ltd. on 04.02.2010 Package-II: BHEL Ltd. on 27.02.2012 Package-III:Hyosung Corporation on 28.02.2012 Package-IV: SudkabelGmbh on 27.05.2011 Package-V: Schneida Electric Ltd. on 21.11.2013. <b>Transmission Works:</b> Joyti Structures & Gammon (India) JV on 12.08.2010 (Ammended on 10.6.2013)	<b>Dam:</b> Excavation 66.55 lac cum out of 70.45 lac cum is completed. Concreting yet to be taken. Excavation of dam pit was hampered due to movement & subsidence at right bank hill. <b>Desiltingchamber:</b> Excavation &concreting completed. <b>HRT:</b> excavation and lining completed. <b>Surge Shaft:</b> Boring & Lining completed. <b>Pressure shaft:</b> Excavation is completed and back fill concreting 1202m completed out of 1460m. <b>Power House:</b> Excavation, Construction of Service Bay and Construction-I at D/T level completed. Construction-II at Auxiliary Bay Level 4962 cumec out of 10260 cumec completed. <b>TRT:</b> excavation completed and overt lining completed . <b>E&amp;M works:</b> Assembly & welding of Spiral Casing segments of unit#4 is in progress.Assembly of Stators for Unit #1,#2& # 3 completed . Rotor for Unit #1& #2 is erected. <b>Critical:</b> Movement & subsidence at right bank hill. Completion of dam works.

Sl. No.	Name of Project / Capacity (MW)/ Executing Agency/Date of CEA clearance / Approval / Broad Features/Commissioning Schedule	Award of works	Broad Present Status
2.	<b>Punatsangchhu-II</b> 6x170=1020 MW PHPA, Bhutan Date of TEA: 30.04.2010 Broad Features : Dam – 86m High, 213.5m long, concrete gravity HRT- 11m x 8.585 km Pressure Shaft: 3 nos. 5.5mx997m each Surge Shaft:31 m x137m TRT: 11.0m x3163m P.House-Underground Turbine- Vertical Francis SWYD- 400 kV Commissioning Schedule: June' 2017 <b>Anticipated commissioning schedule: 2020-21</b>	<b>Civil Works:</b> Package- CI : JP Associate Ltd. on 25.07.2011 Package-CII: Gammon India Ltd on 25.07.2011 Package-CIII: JP Associate Ltd. on 25.07.2011 <b>E&amp;M Main Works:</b> Package-I: BHEL Ltd. on 18.07.2012 Package-II: BHEL Ltd. on 7.05.2013 Package-III: Hyosung Corporation on 7.05.2013 Package-IV:LS Cables & System Ltd. on 7.05.2013 <b>Transmission Works:</b> Bhutan Power Corp.Ltd on 21.03.2013 (on deposit work basis)	<b>Dam:</b> Excavation completed. Adverse geological situation faced at the left bank of the dam. Conc. 42349 cum completed out of 886000 cum. <b>HRT:</b> heading excavation 6178.5 m out of 6314m completed. Benching excavation 4515 Km out of 6314m completed. Overt lining 3950 m and Invert lining 987.31 m completed out of 6314 m. <b>Surge Shaft:</b> Excavation & Lining (Overt) completed. <b>Pressure Shaft:</b> Excavation Completed. Top, Horizontal and Vertical portion Liner completed. 1327m out of 1454m steel lines erected in horizontal portion. <b>Power House:</b> Machine hall excavation Completed. Erection of Draft tubeliners for Unit #2 & #3 is completed, and for Unit #1, #4, #6 are in progress.  Transformer Hall excavation completed. Excavation of Down Surge Chamber Gallery completed (60%).  On 02-03 March,2016, massive rock fall from the roof of downstream Surge Gallery occurred.  <b>TRT:</b> Heading Excavation: 3201m completed & 2394m overt lining also completed.  <b>Critical:</b> - Restoration & completion of downstream Surge gallery works.
3.	<b>Mangdechhu HEP</b> 4x180=720 MW MHPA, Bhutan Date of Approval:: 30.04.2010 Broad Features : Dam – 114m High, 141.28m long, Concrete gravity HRT- 6.5m x 13.561 km Pressure Shaft: Two nos. 3.5mx1856m each Surge Shaft:13.5 m x152.0m TRT: 8.0m x1295m Power.House-Underground Turbine- Pelton Vertical axis SWYD- 400 kV Commissioning Schedule: Sep'17 <b>Anticipated commissioning schedule: 2018-19</b>	<b>Civil Works:</b> Package-I : JP Associate Ltd. on 20.03.2012 Package-II: Gammon India Ltd on 20.03.2012 Package-III:JP Associate Ltd. on 20.03.2012 <b>H&amp;M Works:</b> Package-IV: PES Engg.Pvt.Ltd. on 20.03.2012 <b>E&amp;M Works:</b> Package-I: BHEL Ltd. On 07.01.2013 Package-II: Alstom T&D India Ltd. on 20.03.14 Package III: M/s Hyosung Corp. South Korea on 22.04.15 Package IV: M/s LS Cable & Systems Ltd., South Korea on 22.04.2015 <b>Transmission works:</b> Kalpataru Power Trans Ltd. on 1.01.2013	<b>Dam:</b> Excavation is almost completed. Concreting started in May,15 and 4.42 Lakhs cum completed out of 4.68 lakhs cum. <b>HRT:</b> 13.460 Km (99.6%) Excavation and 5.0934 Km (44%) Overt lining & 2.728 km Invert lining completed out of 13.52 km. <b>Pressure shaft:</b> Excavation is completed. <b>Surge Shaft:</b> Lining completed (97%). <b>Power House:</b> 17630 cum completed out of 18000 cum. <b>Tail Race Tunnel :</b> Completed. <b>H&amp;M Works:</b> Fabrication (99%) and erection (78%) completed. <b>E&amp;M works:</b> Boxing up of U#1 & 2 is in progress to be completed by Feb,2018. MIV installation for U#1,2,3 is in progress. Erection of Bus Duct for all units is in progress.  <b>Critical:</b> HRT Lining & Installation of Radial Gates of Dam & Pressure shaft liner works.