Annexure – I

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CHAPTER -I
INTRODUCTION

1.0 Energy is the fountainhead through which flows the economic growth of a country, in turn accelerating the social development of the Nation. The energy sector has to undergo a strict scrutiny to fulfill the promise of adequacy, reliability, quality standards and environmental friendliness topped with economy.

1.1 The Country has made significant progress in the energy sector with the quantum jump from a mere capacity of 1713 MW in 1950 to around 400 GW in 2021. The identified hydro potential of the country estimated at around 1,50,000 MW has a lot to look forward in terms of harnessing the same to meet the growing need of the energy and also promoting regional development in the country. Hydro despite being technologically well established source of energy has of late faced challenges in terms of long gestation period, cumbersome clearances & higher cost viz-a-viz the other sources of renewable energy.

1.2 The growth of demand has been rising continuously from a mere 18 kWh per person in 1950 to 1208 kWh in 2020. The demand estimation in the current decade is likely to maintain a growth rate of over 6% per annum.

1.3 Himachal Pradesh is blessed with abundant water resources in its five major river basins Satluj, Beas, Ravi, Chenab and Yamuna. Total hydro potential of all these river basins in the state is 24567 MW.

The Government of Himachal Pradesh has always been alive to the well being of the people of the state and at the same time contributing to the fulfillment of national objectives. The vision of the state is to be the leader in hydro power development and to diversify state green energy portfolio. Finding it difficult to harness the potential of power in the state due to scant resources facing a stiff competition from the development of other infrastructure needs of the state, it was found prudent to seize the initiative of partnership with Central /Joint sector as also the Private sector. Thus "Hydro Power Policy, 2006" for the state was formulated with the objective of providing adequate energy at economical cost, capital investment in hydro power and to promote efficient & environment friendly initiatives.

1.4 Out of the total estimated hydro potential of country at around 1,50,000 MW, only about 47000 MW (32%) capacity has been harnessed. However, a capacity of 10,948 MW (45%) has been commissioned in Himachal Pradesh out of total potential of 24567 MW and projects of 2625 MW capacity are under construction. Apart from this, allotted projects of 9165 MW capacity are under clearance and balance potential is under allocation.

1.5 Himachal Pradesh is targeting 10,000 MW green energy capacity addition by 2030 which brings focus on prioritizing the early completion of under construction hydro projects, bringing under clearance projects to construction stage and allocation of balance unallocated projects apart from increased priority on development of solar, wind & bio-mass potential. There will also be added emphasis on optimization of capacity of the existing and pipeline hydro power projects.

1.6 Himachal Pradesh has estimated capacity of 34.111 GW in respect of renewable sources other than hydro - 34 GW Solar, 84 MW Wind and 27 MW Biomass. Himachal Pradesh has inherent advantages in development of Pumped Storage Projects (PSPs) and can develop itself as water battery of the country. This calls for immediate identification of the PSPs potential apart from incentivising such projects in a big way by the Central as well as the State Government.

Besides, hybrid projects with small hydro development coupled with solar / wind power need to be investigated and identified.

1.7 The economic growth leads to growth in energy demand and in fact both are intertwined. In the challenging scenario of climate change and commitments under Paris Agreement, the high demand of energy is going to be met out by non-conventional / green energy in future primarily from Variable Renewable Energy (VRE) sources like wind & solar. Hydro power thus can contribute significantly to meet balancing requirement of the grid. In addition, Storage projects / PSPs / BESS / Hydrogen Storage are Long Duration Energy Storage (LDES) systems which need prioritization. However, hydro power sector needs to be appropriately compensated through policy interventions in the form of financial assistance especially for prioritising creation of peaking storages and also the expeditious clearances mechanism apart from preferential tariff mechanism.

1.8 In spite of getting so much emphasis at national and state level, the share of hydro power in the country has declined from 26.12% in March, 2005 to 12.35% in March, 2020. The installed capacity through other renewables has increased in the country from 3,812 MW in March, 2005 to 1,04,031.32 MW as on 30.11.2021 clearly pointing to the need of renewed focus by all the stakeholders on expeditious development of remaining hydro power potential in the country.

1.9 Hydro Power Policy, 2006 of the state has served its objectives well. Over the last 15 years, there has been paradigm shift in energy scenario of the country. The Country is moving towards renewable energy i.e. total green energy as per Paris Agreement and commitments made under this COP-26. The solar and wind power share is increasing at a faster rate than the hydro. Hydro power along with hybrid, battery, pumped storages and hydrogen energy are going to be the focus areas in coming years. As of now, only frequency control ancillary services are mandated by CERC and provided by Inter-State Generating Stations (ISGS) and substantial need is going to arise for other ancillary services like voltage control and black start etc. Hydro power is the most suitable instrument for such requirement. The new policy framework aims at providing an affordable, reliable and quality power to the consumers round the clock, throughout the year, mitigate the social, economic and environmental impacts and take care of various mandates of the Electricity Act, 2003 which seeks to promote competition, protect the interest of the consumers, tariff rationalization, strengthening the Regulatory Institutions and providing indiscriminate open access to different users.

1.10 To cater to the challenges and getting maximum benefit out of the emerging and dynamic energy scenario of the country, the Hydro Policy of the state needed to undergo an overhaul, in conformity with the new policies, regulations & challenges and also need to devise new policy instruments for expeditious harnessing of pumped storage potential, biomass & solar power and hydrogen energy in the state has led to the evolution of new Energy Policy 2021 of the state.

CHAPTER-II
JOURNEY OF POWER DEVELOPMENT IN THE STATE

2.0 Hydro power development journey in the state had started much before the State was granted full statehood in 1971. State has the honour to commission second hydro-electric project of the country - 100 KW Bhuri Singh Project in district Chamba, having been executed by the erstwhile Raja of Chamba state in 1908. Subsequently, 1.75 MW capacity Chaba project near Shimla during 1913 and 48 MW Shanan project near Joginder Nagar in district Mandi during 1932 were commissioned. Later, 66 MW capacity Bassi HEP was executed by the department of Multi-Purpose-Projects & Power. Subsequently, during the year 1963, the 1478 MW Bhakra dam project was commissioned.

2.1 After achieving Statehood, Himachal Pradesh State Electricity Board (HPSEB) was constituted in 1971 and entrusted with the responsibility of development, generation, transmission and distribution of electricity. Bhakra Beas Management Board later in the year 1977 commissioned 990 MW Beas Satluj Link Project and in 1978, 396 MW Pong Dam Project. In the same year, HPSEB added to the installed capacity by commissioning Giri HEP of 60 MW.

2.2 To expedite the harnessing of the potential, State further roped in central sector agency - National Hydro Power Corporation (NHPC), which completed 180 MW Baira Siul in 1980 and subsequently commissioned Chamera-I, II & III HEPs with total capacity 1071 MW in Ravi Basin. HPSEB steadily progressed to commission 6 MW Binwa HEP in 1984 and achieved laurels by commissioning 2 MW Rongtong HEP in district Lahaul Spiti at an altitude of EL 3600 m. Further, in the year 1989, HPSEB set a landmark in the engineering field by constructing the Country's first underground power house namely Sanjay Vidyut HEP 120 MW.

2.3 For expeditious harnessing of hydro power, the State formed a Joint Venture with Central Government - Nathpa Jhakri Power Corporation (NJPC) in 1988, which subsequently was renamed as Satluj Jal Vidyut Nigam Limited (SJVNL) in the year 2002 (now SJVN Limited) with the State's share of 26.85% (December, 2021). SJVNL has successfully commissioned two projects of capacity 1912 MW - Nathpa Jhakri HEP 1500 MW & Rampur HEP 412 MW and is in process of implementation of many other projects in the state.

2.4 In 1988, HPSEB added to the feathers in its cap by achieving the target of 100% electrification of census villages of Himachal Pradesh.

2.5 Realizing the importance of faster development, the State opened the sector for private project developers in 1990s. It was considered necessary to bring in private sector investment and expertise in the field and the initiative fructified by the commissioning of 86 MW Malana-I HEP in 2001. For harnessing mini, micro and small hydro projects, a dedicated state agency named HIMURJA was constituted in the year 1989, which realized its efforts in the form of commissioning of its first project 200 kW Kothi in 2001 followed by 100 kW Sural project in tribal area of Pangi in 2002.

2.6 In the initial years of 21st Century, State Power Sector set records by commissioning projects like country's largest single-stage project Nathpa Jhakri 1500 MW HEP, Malana-I 86 MW, Baspa-II 300 MW, Chamera-II 300 MW, Larji 126 MW, Allain Duhangan 192 MW, Karchham Wangtoo 1000 MW, Chamera-III 231 MW, Budhil 70 MW, Parbati-III 520 MW, Rampur 412 MW and Koldam 800 MW.

2.7 Last ten years have posed several challenges to hydro sector development in the state especially in terms of environmental and social factors, unfavourable and uncertain tariff

scenario coupled with increased enchantment of investors with the Solar / Wind power projects and other conventional energy sources. Several policy initiatives taken in last four years have resulted in infusing renewed vigour to this sector thereby considerably eliminating the inertia in the sector.

2.8 In order to increase the pace of development of the sector and to facilitate the private investment leading to substantial economic activity in the remote and interior areas of the state, the State Government formulated Hydro Power Policy for the state in 2006 and introduced provisions like Local Area Development Fund (LADF) etc. for improving ownership of projects by the local communities.

2.9 After the introduction of Electricity Act, 2003, Himachal Pradesh Power Corporation Limited (HPPCL) was established as generation arm in 2006, Himachal Pradesh Power Transmission Corporation Limited (HPPTCL) in 2007 as Transmission arm and HPSEB was reorganized as HPSEB Limited (HPSEBL) with prime function of distribution. Himachal Pradesh State Load Despatch Center (HPSLDC) was established in 2002.

2.10 HPPCL was allotted major chunk of hydro power projects of 2070 MW capacity in 2009. In total 22 hydro power projects and two solar power projects with installed capacity of 3156 MW and 15 MW respectively were allotted. Currently, 3 hydro power projects namely Sainj 100 MW, Kashang-I 65 MW & Sawra Kuddu 111 MW HEPs and one solar power project Berra Dol 5 MW are under operation and 19 hydro power projects & 1 solar power project are at different stages of development with aggregate installed capacity of 2875 MW.

2.11 The transmission system requirements of Himachal Pradesh are different as compared to other states since it caters to the evacuation of power during the period it has surplus power and imports power from other states during winter months. The intra-state transmission network of the state comprising 66 kV and above is being operated by HPSEBL and HPPTCL. HPSEBL had been responsible for creating and maintaining the transmission system till 2008 before the unbundling of HPSEB under the reforms process. HPPTCL was then declared as State Transmission Utility (STU) and is the deemed transmission licensee. It is now responsible for planning and execution of all new 66 kV and above systems in the state. The open access in transmission as per the provisions of Electricity Act makes HPPTCL under obligation to provide on-demand open access to the transmission systems to facilitate such multi lateral energy transmission on payment of transmission charges as determined by Himachal Pradesh Electricity Regulatory Commission (HPERC). It is obligatory to provide evacuation system for any Project above 100 MW and transmission system availability, beyond inter-connection point for projects below 100 MW capacity. HPPTCL completed Wangtoo 400 / 220 / 66 kV, Bhoktoo 220 / 66 kV and Lahal 400 / 220 kV substations. To meet the target of harnessing 10,000 MW by 2030 as fixed by State, HPPTCL has drawn a master plan in consultation with Central Transmission Utility (CTU) and Central Electricity Authority (CEA) for strengthening of Intra-State Transmission System by using State of art technology and making available evacuation system for added capacity.

2.12 HPSEBL was constituted in 2010 as a sole State Distribution Utility. Currently, the yearly consumption of the State is about 10,000 MUs out of which 88% of the requirement is being met from hydro power generation. HPSEBL tied up power of 291 MW from Central Sector Projects through long term PPAs ending 2003 as the requirement was not possible to be met from own projects, the demand forecast prompted HPSEBL to tie up further a quantum of about 837 MW of power from central/ joint sector projects besides PPAs with private sector project developers, between 2003 and 2011, however, the self-sufficiency was attained in the year 2012. HPSEBL is procuring power from small hydro power projects up to 25 MW and also PPAs have been signed with solar power projects for about 61 MW as mandated by