

DRAFT

PUNJAB GREEN HYDROGEN
POLICY

Abbreviations:

- **CGP:** Captive Generating Plant
- **CLU:** Change of land use
- **COE:** Centre of Excellence
- **COP:** Conference of the Parties
- **DISCOMs:** Distribution Companies
- **DPR:** Detailed project Report
- **EDC:** External Development Charges
- **FCI:** Forecast Confidence Index
- **GOP:** Government of Punjab
- **GST:** Goods and Services Tax
- **IIT:** Indian Institute of Technology
- **MOU:** Memorandum of Understanding
- **MSMEs:** Micro, Small and Medium Enterprises
- **MWh:** Megawatt-hours
- **MW:** Megawatt
- **NRSE:** New & Renewable Sources of Energy
- **PBIP:** Punjab Bureau of Investment Promotion
- **PEDA:** Punjab Energy Development Agency
- **PNG:** Piped Natural Gas
- **PSERC:** Punjab State Electricity Regulation Commission
- **PSPCL:** Punjab State Power Corporation Limited
- **R&D:** Research and Development
- **RE:** Renewable Energy
- **TPD:** Tonne per day
- **USD:** United States Dollar

1. Introduction

Climate change is a major challenge before the world. Glasgow Climate Pact arrived at COP 26 has set a target of reaching net-zero carbon dioxide emissions by around 2050 so as to achieve goal of limiting temperature rise to 1.5°C above pre-industrial levels. This requires aggressive de-carbonization of economies requiring concerted and wide-ranging actions across all economic sectors i.e., structural and transitional changes in our global energy production, consumption and related socio-economic systems.

The energy transition requires a major shift from fossil fuels to renewable energy sources promoting its usage across all bulk users like State DISCOMs, vehicles, railways, heating / cooling in buildings, Power intensive industry and using such energy for producing green Hydrogen / Ammonia as a fuel / feed stock for sectors like chemicals, fertilisers, maritime shipping, and aviation etc. replacing fossil fuels and feed stock.

Green Hydrogen produced using renewable sources of energy is a clean energy and industrial feedstock. It can meet the demand of sustainable applications requiring high energy density or that located away from electricity grids. Green Hydrogen can be used as a non-polluting feedstock for chemical reactions to produce a range of synthetic fuels and feedstocks. Green Hydrogen also has the benefit of system flexibility, storage, energy security, reduced air pollution, economic growth, job creation and industrial competitiveness.

Transitioning Green Hydrogen to a wide spread energy carrier will require dedicated and integrated policy approach to overcome the initial resistance for reaching a minimum threshold for market penetration and building national Hydrogen strategies, identifying policy priorities, establishing a governance system, enabling rules / regulations and creating a system for guarantee of origin for green Hydrogen.

Currently, green hydrogen is much more expensive than the grey hydrogen produced using natural gas. However, the markets and policy environment are fast evolving and providing an impetus to evolve green hydrogen demand across sectors. The global green hydrogen market is expected to grow nearly 40 percent annually until 2030 further accelerating to USD 2.5 trillion by 2050 buoyed by climate commitment and push to decarbonise hard-to-abate sectors like petrochemical, fertilizer, steel, heavy duty trucking, shipping, and aviation.

India's commitment to achieving net zero by 2070 also places a strong policy signal for all the stake holders toward deep decarbonisation priorities at the national and sub-national levels. The Government of India-led 'National Hydrogen Mission 2022'

and 'National Green Hydrogen Policy 2022' will be transformational anchors in the coming decade to achieve the vision of becoming a global hub for production and export of green hydrogen. The national efforts are starting to set the foundation for building a conducive green hydrogen economy, thus providing opportunities for states to come forward with their policy efforts.

The per capita income of Punjab stood at Rs. 1,73,873 at current prices in the 2022-23 fiscal (A) registering a growth of 7.4 per cent. The per capita income of Punjab is higher than the national average of Rs. 1,70,620. The state's existing "New & Renewable Sources of Energy Policy 2012" and "Punjab Industrial & Business Development Policy 2022" carved a pathway for industrial expansion and attracted investments for regional development.

Government of Punjab recognises the opportunity and necessity to plan immediate actions towards net zero goal while ensuring economic development and just transition. The Government of Punjab has nominated PEDDA as Nodal Agency under NRSE Policy 2012 and proposes the 'Punjab Green Hydrogen Policy 2023' to promote growth and employment in the state while prioritising decarbonisation and the state's contribution to India's climate goals. The policy shall promote green hydrogen / ammonia production mainly using abundantly available biomass through creation of demand and marketing. The policy shall ensure a conducive ecosystem in the state to support its ambition to be a leading green hydrogen / ammonia economy.

2. Punjab – an agrarian state with strong industrial base.

The State of Punjab situated in North West India, is one of the most developed State with very high per capita income and development index including infrastructure such as highways, Rail, Power, Education, Telecommunication etc. The State has excellent human capital & progressive people.

Punjab being agrarian state has done exceedingly well in Agriculture and has earned the epithet of "Granary of India". Punjab has highest per capita availability of milk which is almost four times higher than all India level. It is also the 2nd highest cotton and blended yarn producer in the country. Punjab has highest productivity of Kinnow, a citrus fruit in the country and highest production of honey in the country.

Agriculture produces has huge quantities of agro-residues like paddy straw and other biomass wastes like rice husk, sugarcane trash, cotton stalk, sunflower stalk etc. which can be profitably used to generate various forms of energy like Electricity, Biogas and Bio manure. Biogas can further be processed to produce Green Hydrogen.

Agriculture, however, has limited potential to drive future economic growth of the State. However, the abundant biomass wastes produced by agriculture can be used for producing green hydrogen to meet the demand in the region / country and grab the evolving export market. Producing Green Hydrogen from raw bio gas by using biomass will produce value added products like Carbon dioxide and fermented bio manure. Thus, turning the biomass usage to produce Green Hydrogen can play an important role in future economic growth of the State and creation of jobs for its youth.

3. Title and Commencement

The Policy shall be called “Punjab Green Hydrogen Policy 2023” and shall come into effect from the date of its notification in the Official Gazette. The policy shall remain in force until it is amended or superseded by the State Government.

This policy shall be treated as Directive under Section 108 of Electricity Act, 2003 are being issued to the PSERC for amending the regulations to incorporate the concessions / incentives provided in the National Green Hydrogen Mission of Govt. of India.

4. Vision & Mission & Target

4.1. Vision

To make Punjab a preferred destination for investment in the Green Hydrogen production and marketing with conducive eco-system.

4.2. Mission

- a) To develop innovative manufacturing capacities of producing Hydrogen, such as Biomass gasification, Steam methane reforming, electrolysis of waste water, Hydrogen fuel blending, etc.
- b) To promote the downstream chain of manufacturing, usage across sectors in the state and marketing at the national / international level.
- c) Skill Development and utilization of the human capital of the State for the Hydrogen gas sector
- d) To support research and technological up-gradation of Industry
- e) To promote ease of doing business by introducing one stop clearances through PBIP and providing fiscal incentives for the industry to make Green Hydrogen manufacturing in the state globally competitive.

4.3 Target

It is targeted to make Punjab a Green Hydrogen/Ammonia producer with a production capacity of 100 Kilo tonnes per annum by the year 2030.

5. Definitions

- a) “Electrolyser”: An “Electrolyser” is a system or device that uses electricity to split water molecules into hydrogen and oxygen, thereby producing hydrogen gas as a sustainable source of clean energy
- b) “Energy Transition”: Energy transition is an energy paradigm revolution. In the case of the current energy transition, this means the transition from non-renewable energy sources to renewable sources.
- c) “Net Zero”: Net zero means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere by oceans and forests, for instance.
- d) “Green Hydrogen / Ammonia”: Green Hydrogen / Ammonia are produced by the process of electrolysis of water using renewable energy or using banked renewable energy. Biomass based hydrogen produced using pyrolysis of biogas or other biomass products are also classified as green hydrogen.
- e) “Grey Hydrogen”: Grey hydrogen is produced from natural gas or methane, using steam methane reformation but without capturing the greenhouse gases made in the process.
- f) “Hydrogen Cluster”: A “Hydrogen Cluster” is a geographical area where several hydrogen applications are combined into an integrated hydrogen ecosystem that consumes a significant amount of hydrogen, improving the economics behind the project.

6. Ease of Doing Business

The Government of Punjab has taken various initiatives to promote and boost the business and industrial environment in the State by bringing in reforms and simplifying the procedures of registrations. Under the “Punjab Industrial and Business Development Policy 2022”, following initiatives towards ease of doing business are in place: -

- a) To scale up Invest Punjab Business First portal for a single unified interface to the Industry and Businesses for all regulatory and fiscal services throughout their lifecycle and its Integration with National Single Window System.
- b) To re-engineer the processes of 7 core departments on priority namely Industries & Commerce, Power, Science Technology & Environment (Punjab Pollution Control Board), Labour, Housing & Urban Development, Local Government and Taxation to make them extremely simple, industry friendly and completely digital.
- c) To simplify and reduce checklist of various regulatory services at all levels of processing.

7. Research & Development (R&D) and Innovations

The policy shall support R&D and innovation across the green hydrogen / ammonia value chain through the following interventions:

- a) State shall provide the Budget for Research and Development Activities for Green Hydrogen /ammonia.
- b) Establish the Centre of Excellence (CoE) with different academic and research institutions and industries to undertake the following activities:
 - (i) Facilitate the development of a sustainable green hydrogen / ammonia ecosystem by promoting collaboration among various stakeholders such as academic institutions, renewable energy developers, hydrogen producers, industrial consumers, etc.
 - (ii) Lead experimental research to overcome techno-economic challenges associated with different components of the green hydrogen / ammonia value chain
 - (iii) Partner with industry players to fast-track green hydrogen / ammonia technology development and deployment in the state.
 - (iv) Promote a skill development programme to build the capacity of the state and train workforce to be ready for the green hydrogen / ammonia transition.
- c) Assess green hydrogen's transportation while supporting R&D activities to find sustainable and economical solutions.
- d) Explore technology demonstration and proof of concept pilots for green hydrogen applications in emerging use cases such as heavy-duty transport, energy storage, etc.

8. Incentives for Hydrogen based Eco System

Besides the above, GOP shall undertake the following interventions to facilitate existing and new green hydrogen / ammonia investments. In case of any overlap with the incentives provided in other policies, the incentives provided in this policy shall prevail.

- a. Incentives as provided in “Punjab Industrial and Business Development Policy 2022”, shall be available to new green hydrogen / ammonia investments and expansion of existing units in the state based on Green Hydrogen and Ammonia depending on the category to which the project belongs as per the policy provisions.

The policy can be accessed at:

<https://pbindustries.gov.in/webportal/uploads/pdf/files/0dab7d2743d9b45eef544216c5184d2b.pdf>

- b. NRES Policy 2012 incentives
 - (i) 100% Electricity duty exemption during construction
 - (ii) No CLU and EDC Charges for change of agriculture land to industrial use
 - (iii) 100% Stamp duty exemption for Land Registration

- (iv) 100% Stamp duty exemption for Land lease.
- c. GOP shall allot Panchayat Lands for setting up of Projects as well as biomass storage if available, on the terms and conditions as per the policy of Department of Rural Development and Panchayat dated 09.05.2014 and its further amendments time to time. The notification can be accessed at the: [panchayat_land.pdf \(peda.gov.in\)](http://peda.gov.in/panchayat_land.pdf)
 - d. "Invest Punjab Business First" portal to provide all regulatory services and fiscal incentives to the businesses through one common integrated platform and business friendly service delivery network.
 - e. Production of Green Hydrogen / Ammonia shall be considered under the ambit of the 'NRSE Policy 2012', and the existing incentives as per the policy shall apply. The policy can be accessed at the [nrsepol2012.pdf \(peda.gov.in\)](http://peda.gov.in/nrsepol2012.pdf)
 - f. The machinery required for baling, collection and transportation of biomass for usage in Green Hydrogen / Ammonia generation plants will be covered under the DPR of the project for incentives applicable if any.
 - g. Cross subsidy surcharge and Additional surcharge shall not be applicable on green energy is utilized for production of green hydrogen and green ammonia.
 - h. Concession in Contract demand charges if green energy is utilized for production of green hydrogen and green ammonia
 - i. 50% exemption in Intra State transmission charges and wheeling charges on green energy is utilized for production of green hydrogen and green ammonia.
 - j. The obligated entity can set off their renewable purchase obligation by purchasing green hydrogen or green ammonia. The quantum of such green hydrogen or green ammonia would be converted into MWh by considering the equivalence to the green hydrogen or green ammonia produced from one MW of electricity from the RE sources, as per the norms approved by the central commission.
 - k. Waiver of inter-state transmission charges of Central Transmission Utility for a period of 25 years will be allowed to the manufacturer of Green Hydrogen and Green ammonia for the project commissioned before 31st December 2030 may be availed under regulations of the Central Commission.
 - l. Preference shall be given to those green hydrogen plants where treated sewage water shall be utilized for electrolysis instead of fresh water. In addition to this, electrolysis based Green Hydrogen Projects can only be allowed in safe zones of Punjab Region.
 - m. PSPCL may also procure and supply Renewable Energy to the manufacturers of Green Hydrogen / Green Ammonia in their States as per the charges fixed by the PSERC. (Charges already notified by PSERC as per annexure VII of tariff order of PSPCL for 2023-24).
 - n. Capital Subsidy of maximum Rs. 15 Crores per project at a rate of 3 Crore per TPD upto a maximum of 5 TPD project only from biomass to Green Hydrogen for a maximum of 10 projects.

- o. 20% Capital subsidy subject to maximum Rs. 50 Lakhs per vehicle for first 100 Hydrogen based fuel cell trucks / buses.
- p. A subsidy Rs. 50 per kg will be provided to the first 10 industries for consuming green hydrogen in the State of Punjab for a period of 5 years.
- q. 20% Capital cost subsidy subject to maximum Rs. 3 Crore to first 10 hydrogen refuelling stations in the State of Punjab.
- r. PSERC has approved detailed Banking Procedure for Renewable Energy Projects set up as CPPs for captive usage of power generated by the consumer of PSPCL.

Banking Procedure: "Banking shall be permitted at least on a monthly basis on payment of charges to compensate additional costs, if any, to the distribution licensee by the Banking and the Appropriate Commission shall fix the applicable charges.

- (i) The permitted quantum of banked energy to be carried forward to next month shall be upto 30% of the total monthly consumption of electricity from PSPCL.
- (ii) The banking charges shall be 10% of power banked (in kind) which shall be deducted from the banked power.
- (iii) The banking shall be allowed throughout the year, however, the drawl of banked power shall not be allowed during the peak season / period i.e., 1st June to 30th September.
- (iv) However, the RE based CGP shall be entitled to get Renewable Energy Certificates to the extent of the lapsed banked energy.
- (v) The accounting year for banking of energy shall be on financial year basis i.e. from 1st of April to 31st March next year.
- (vi) The banked energy will not be allowed to be drawn during peak season i.e. 1st June -30th of September each year.
- (vii) The wheeling and transmission charges for the RE power generated and consumed within Punjab shall be 2% or as decided by the PSERC.

Banking facilities shall be provided to Green Hydrogen production units purchasing power from independent power plants.

The above said incentives shall be in addition to the incentives provided by Government of India.

9. Infrastructure Development

The green hydrogen / ammonia ecosystem development will need infrastructure advancements across the value chain. The policy shall support infrastructure development by undertaking the following interventions:

- a) Formulate an infrastructure and manufacturing capacity expansion plan for green hydrogen / ammonia to ensure long-term demand and support.

- b) Promote blending of green hydrogen with grey hydrogen, PNG in existing Nitrogen fertilizer, refinery units, natural gas, transport, steel etc, achieving at least 8% percent of green hydrogen in the consumption mix by 2030.
- c) Promote 100 percent green hydrogen / ammonia production and consumption in new units.
- d) Develop green hydrogen / ammonia parks in the state. The park model essentially promotes green hydrogen / ammonia production and consumption centres. New capacities shall converge as a cluster which facilitates the easy uptake of green hydrogen / ammonia within the state
- e) Promote the deployment of solar energy generation plants to cater to the demand for green electricity in the state to produce green hydrogen using the electrolysis process.
- f) Set up a 'Green Hydrogen Ecosystem Fund' with a vision of raising a corpus through green cess, which shall be instituted to support small infrastructure projects and ecosystem development.
- g) Provide support for technology advancement and adoption, such as electrolyzers, carbon dioxide recovery units, etc., to promote a green hydrogen / ammonia ecosystem
- h) Promote the development of hydrogen-ready pipelines to transport green hydrogen / ammonia to feasible distances subject to requisite and applicable clearances and safety measures.
- i) Expand electricity transmission and distribution infrastructure across the state to facilitate the development of green hydrogen / ammonia production units.
- j) Provide infrastructure support of fuel cells for promoting hydrogen buses in the state.
- k) State will encourage and support the development of technologies in utilization of biomass / agriculture residue / mandi waste for conversion to green hydrogen

10. Project Allotment

The project allotment committee shall be as per the NRSE Policy issued by Department of New & Renewable Energy, Government of Punjab. PEDDA will have the authority to invite 3 special invitees who will be the technical experts in the field of Green Hydrogen either from the Industries / Academia / National institutes / National Laboratories.

The Committee shall examine / evaluate the techno-commercial conditions in the bidding documents for projects to be allocated through competitive bidding / detailed project report for project proposals under MOU route & shall grant approval to the offers / project proposal after considering the financial capability, technical capability, status of technical collaboration with proven technology suppliers, status of land identification and its availability etc.

11. **Nodal Agency:** PEDDA is the Nodal Agency for the implementation of Green Hydrogen Policy on behalf of the Govt. of Punjab. All Hydrogen / ammonia project developers in the state will be required to submit their project proposals with PEDDA for validation and approval of the competent authority. Punjab Bureau of Investment Promotion will provide single window clearances for the project.
12. **Amendment / Relaxation / interpretation of provision of the policy, Government of Punjab:** - Department of New and Renewable Energy Sources shall take up case for amendment / relaxation / addition / interpretation of provisions under this policy.