

# Project : Carbon Bank

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- Startup : DIPPP97117
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# PROBLEM

## Low cost CARBON CAPTURE & Long duration ENERGY STORAGE



7 AFFORDABLE AND  
CLEAN ENERGY

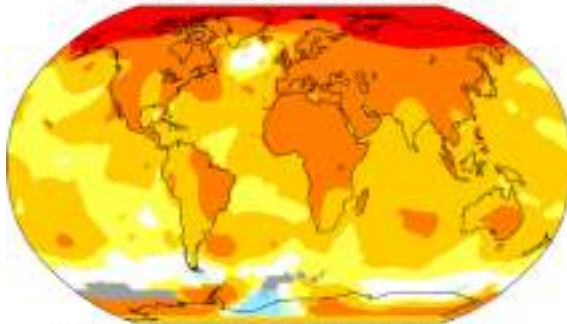
13 CLIMATE  
ACTION



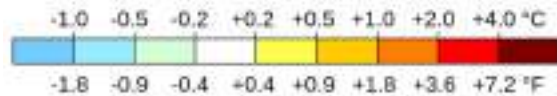
Intermittency & Curtailment  
Climate Extremes



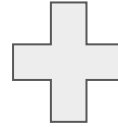
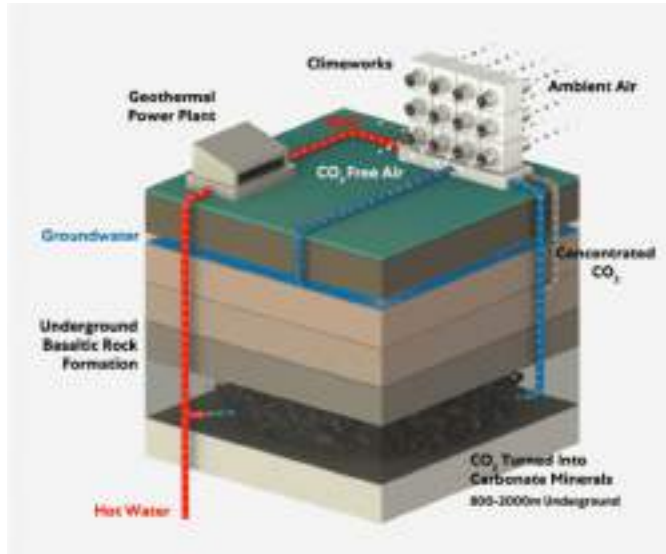
Temperature change in the last 50 years



2011-2021 average vs 1956-1976 baseline



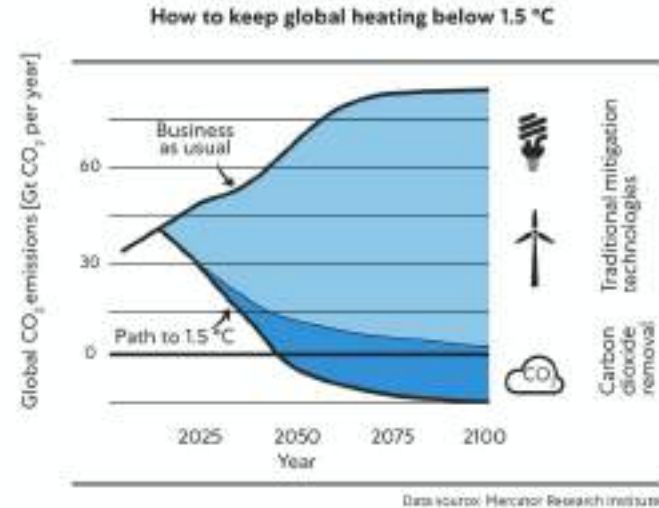
# SOLUTION



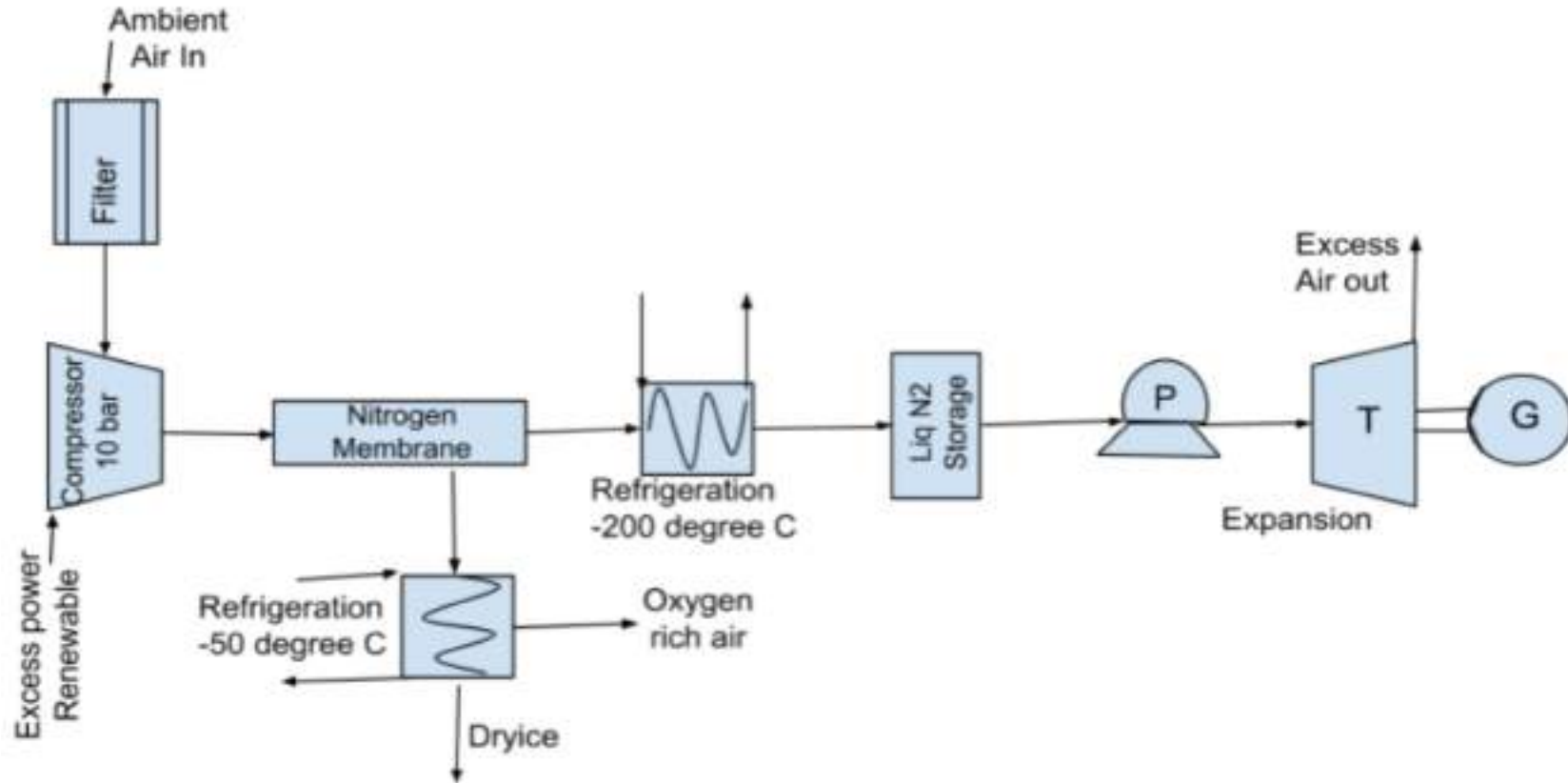
## Carbon Bank : 2 in 1 Solution



- No Chemicals involved
- Safe Utility scale Storage
- Real Carbon Credits
- Easy to deploy, existing supply chain
- Aligned with Climate targets



# Process Flow Diagram



# Stage of Development

*Literature review & study has been done to validate assumptions about the technology, problem/need & our proposed approach.*

- TRL 1
- TRL 2
- TRL 3

*Prototype stage*

 <b>INTELLECTUAL PROPERTY INDIA</b> <small>INVENTIONS   DESIGNS   TRADE MARKS GEOGRAPHICAL INDICATIONS</small>	 <small>सत्यमेव जयते</small>	<b>Government of India Patent Office</b> Intellectual Property Office Building, Plot No. 32, Sector 14, Dwarka, New Delhi-110075 Phone- 011-28032253, 25300200 Fax: 011-28034301, 28034302 e-mail: delhi-patent@nic.in
<b>Application Filing Receipt</b>		
<b>CBR Number : 17024</b>	Application Type: ORDINARY APPLICATION Priority Number: Priority Date: Priority Country: Not Selected	<b>CBR date: 05-05-2022</b>
To, PARTH VERMA Plot no 50, Jawahar Nagar, Rohta road, Meerut		
Received documents purporting to be an application for patent numbered 202211026070 dated 05-05-2022 by PARTH VERMA of 427/42 Adarsh Colony, Jawahar Nagar relating to Direct Air Carbon Capture cum Liquid air Energy Storage together with the Provisional and fee(s) of ₹1600 ( One Thousand Six Hundred only).		
<b>Note:</b> <ol style="list-style-type: none"><li>1. In case of Patent Application accompanied by a Provisional Specification, a complete Specification should be filed within 12 months from the date of filing of the Provisional Specification, failing which the application will be deemed to be abandoned under Section 9(1) of the Patent Act, 1970.</li><li>2. You may withdraw the application at any time before the grant of patent, if you wish so. If, in addition to withdrawal, you also wish to prevent the publication of application in the Patent Office Journal, the application should be withdrawn within fifteen months from the date of priority of date of filing, whichever earlier.</li><li>3. If not withdrawn, your application will be published in the Patent Office Journal after eighteen months from the date of priority of date of filing, whichever is earlier.</li><li>4. If you wish to get your application examined, you should file a request for examination in Form-18 within 48 months from the date of priority or date of filing, whichever is earlier.</li></ol>		

## *Customer segment (s)*

*Our Channel to reach clients are B2B & B2G i.e. Business to Business & Business to Government*

- Government PSU like Aramco, ONGC, etc.
- Private Industries(hard to abate sector)
- Renewable Power Producers(Solar, wind)
- Distribution companies like Grid operator



# Market Size

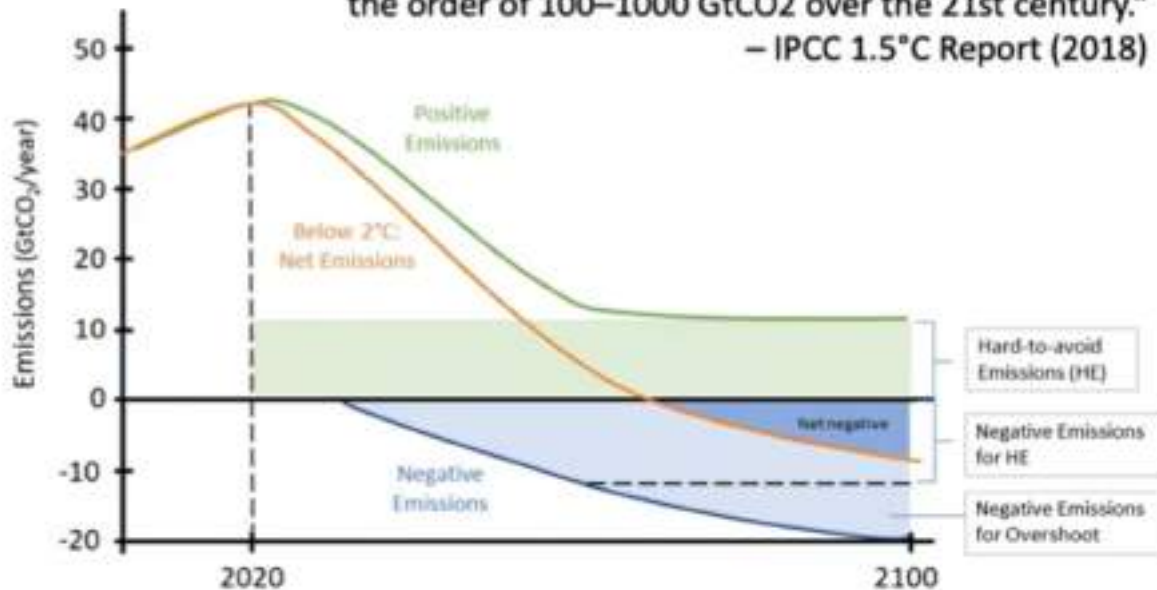
CO<sub>2</sub> removal will become one of the world's largest markets

Climate math asks for 10-20 Gt CO<sub>2</sub>/y

At \$50-100/ton, that's a HUGE market

Needs create markets  
Tech creates opportunities

"All pathways that limit global warming to 1.5°C ... project the use of carbon dioxide removal (CDR) on the order of 100–1000 GtCO<sub>2</sub> over the 21st century."  
– IPCC 1.5°C Report (2018)

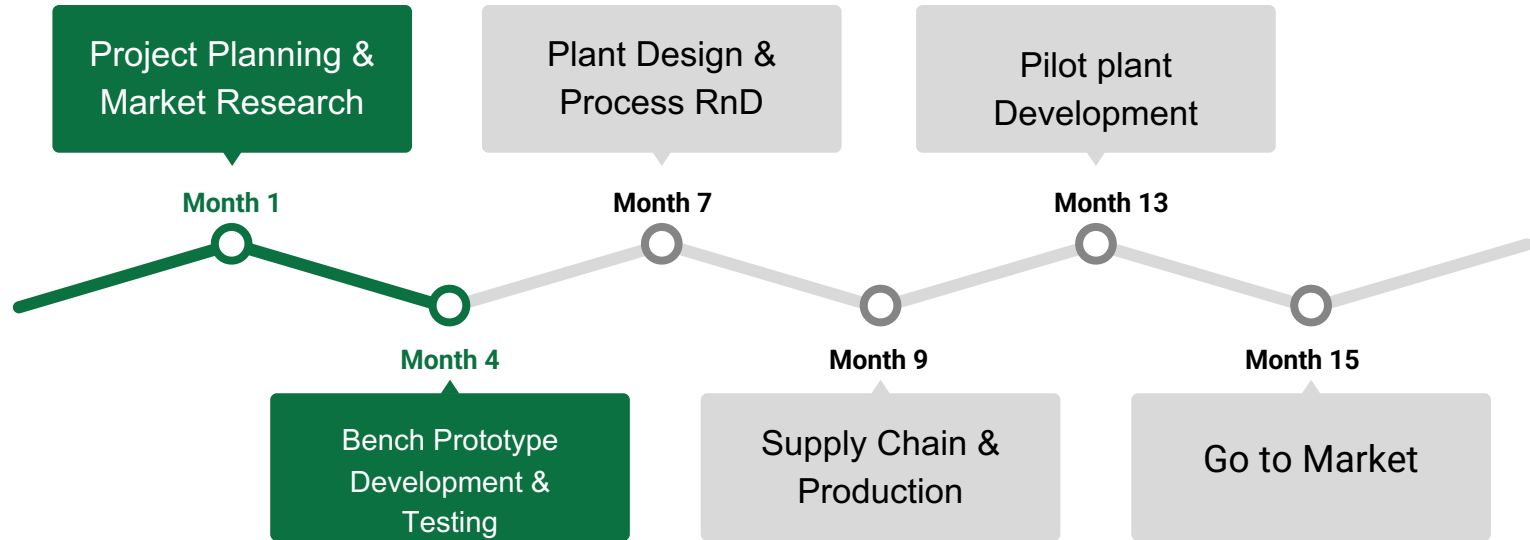


# *Value Proposition*

- Marketing: Clients can claim Net-zero footprint by CDR
- Costing: best LCOS Energy Storage for Renewables
- Taking CO<sub>2</sub> out of air as Dry ice with On-site storage
- Easy to scale & deploy at Utility level (project based)
- Capacity can be increased at any later stage
- Clean air is byproduct, SO<sub>x</sub> & NO<sub>x</sub> traps in dry-ice



# Milestones



Note : According to CO<sub>2</sub> processing capacity , Bench prototype (1kg/day), Pilot plant (5kg/day), Demo plant (300kg/day) with testing of Energy storage (Tentative Timeline)

# Competitive analysis for Grid-scale Energy Storage

	<u><i>HighView Power</i></u>	<u><i>Bakz4ever</i></u>
<b>Company Highlights</b>	Founded in 2005, a long-duration energy storage pioneer	Founded in 2021, provides cryogenic energy storage for Intermittent Renewables
<b>Market Information</b>	UK, USA renewable energy market, transitioning to Renewables source	Power producing or discoms, wants to add Renewables in their portfolio
<b>Product Information</b>	£110/MWh for a 10-hour, 200 MW / 2 GWh system, the CRYOBattery™	Nidhi EIR grant by DST, India
<b>SWOT Information</b>	Backed by Government, Advantageous over other storage, First mover	Funding needed, Provide 2 in 1 solution in less cost, Fast mover

# Competitive analysis for Carbon Dioxide Removal

	<u><i>Climeworks</i></u>	<u><i>Bakz4ever</i></u>
<b>Company Highlights</b>	Founded in 2009, filters the CO <sub>2</sub> directly from the ambient air through an adsorption-desorption process	Founded 2021, offers CO2 removal technology to reduce footprint & create Sink
<b>Market Information</b>	Climate conscious Company & countries who wants to create Negative emissions	Industries with large emissions to offset carbon
<b>Product Information</b>	It has raised a total of \$138.7M in funding CDR subscription service for Individuals	Nidhi EIR grant by DST,India
<b>SWOT Information</b>	Backed by Microsoft, Location specific, uses water & heat, First mover advantage	Funding needed, Not limited with location, Can be scaled fast

# Revenue Model

This slide contains the revenue model of the startup, how we aim to earn revenue from the business.

1. Utilization : Using CO2 into other product making like methanol, synthetic fuel, or direct selling etc
2. Storage : Permanent storage of CO2 in seabed as the water pressure will prevent it to leakout and issue carbon credit certificate against it, trading in carbon market further.
3. Energy Storage : This will work as BOOT model for clients paid pilots operation & maintenance included.(Long duration)
4. Future Tech : Vertical & Horizontal Integrations for revenue Increment.  
Operating B2B & B2G

# Growth and potential of target market

In this slide we explained the growth potential of the target market. Based on new innovations and upcoming sectors we have explained how we see the market for our product growth in the next 10 years.

- Carbon Bank is a 2 in 1 solution for inexpensive Carbon Capture & Energy storage.
- Since India has target of 500 GW of Renewable power, Grid scale Energy storage is needed accordingly.
- Niti Aayog has recently rolled out CCUS policy framework & its Deployment Mechanism in India
- Both the markets will see exponential growth in the next 10 years keeping out 2030 targets in mind.
- Hard to abate Industrial sector needs to be decarbonised, for which government is creating National Carbon Market

# *MARKET VALIDATION*

- <https://frontierclimate.com/> (Early adopters)
- <https://www.iea.org/reports/direct-air-capture>
- <https://www.forbes.com/sites/erikkobayashisolomon/2022/05/10/the-three-es-of-direct-air-capture-essential-evolving-and-everlasting/?sh=6b0daa897bbb>
- <https://www.xprize.org/prizes/elonmusk>