

GIS FOR CITY GAS DISTRIBUTION IN INDIA USING OPEN SOURCE TOOLS

A NEW NORMAL



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Supported by Department of Science and Technology, Government of India





SCIENCE AND TECHNOLOGY PARK, PUNE, INDIA

❖ **Science and Technology Park, Pune** is supported by National Science and Technology Entrepreneurship Development Board (**NSTEDB**), **Department of Science and Technology, Government of India**

❖ Science and Technology Park (Scitech Park) based within Savitribai Phule Pune University Campus, **Pune** and was established in 1986

❖ Geoinformatics Division functional since 2001

❖ Helps City Gas Distribution Companies with Open Source GIS Implementation for their Gas Assets

❖ **Low CAPEX and Distributed OPEX**

Geoinformatics Division

- ❖ Natural Resource Mapping & Preparation of Land Base using Satellite Image Interpretation
- ❖ **City Gas Distribution Network Mapping and Implementation of GIS for CGD**
- ❖ Municipal GIS
- ❖ GIS for Town and Country Planning
- ❖ Vulnerable Area and Hazard Mapping
- ❖ UAV Based Mapping for Urban and Industrial Area



NATURAL GAS DISTRIBUTION IN INDIA

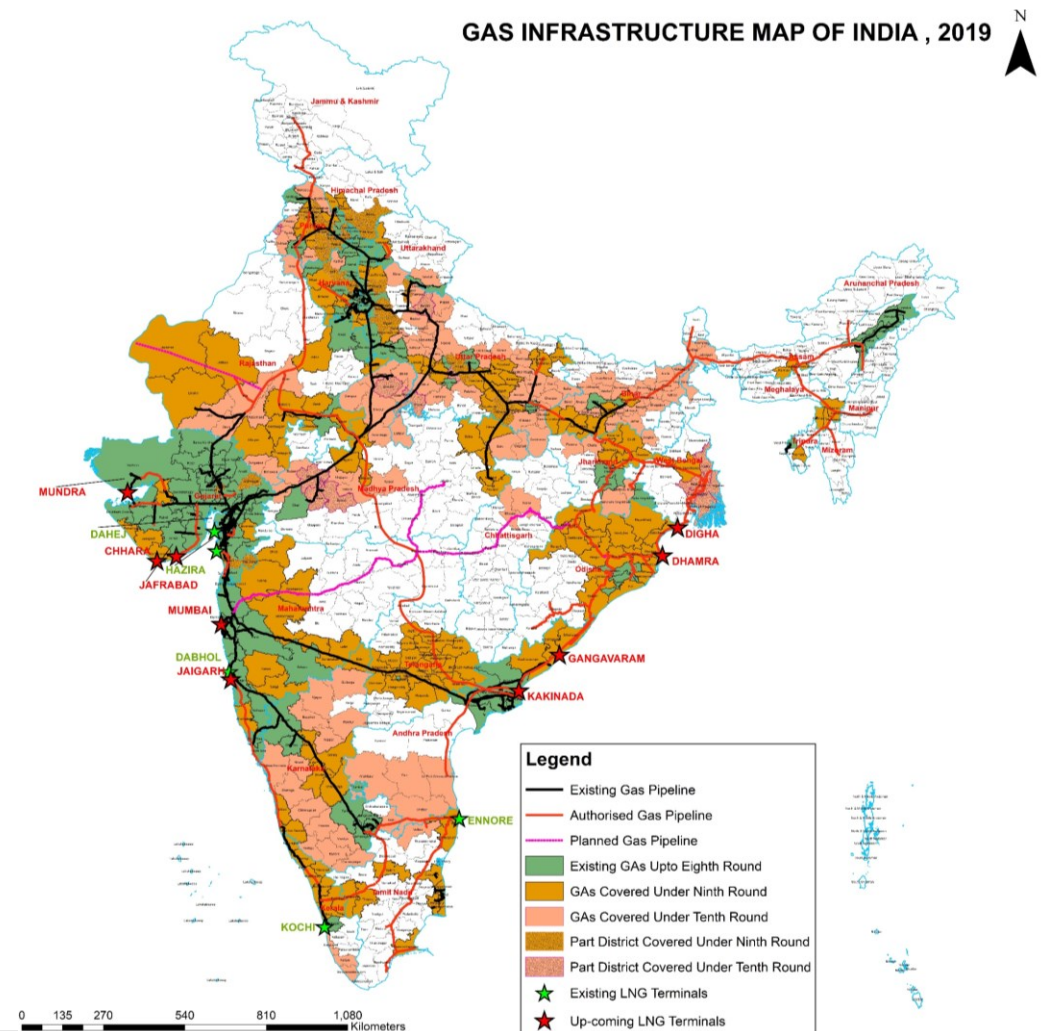
Petroleum and Natural Gas Regulatory Board (PNGRB)

Regulator for transparent Allocation of
Gas Distribution in India

Laying of Foundation Stone for Geographical Area authorized under 9th CGD Bidding Round & Launch of 10th CGD Bidding Round by Hon'ble Prime Minister



Hon'ble Prime Minister of India Shri Narendra Modi remotely laid Foundation Stones for 62 Geographical Areas offered under 9th CGD Bidding Round and launched 10th CGD Bidding Round for 50 Geographical Areas live from Vigyan Bhawan, New Delhi on 22nd November, 2018.





NATURAL GAS CURRENT & FUTURE TRENDS IN INDIA

Natural Gas - Game Changer in India

Env. Friendly

Reduces Co2 Emissions

Impact on Women & Child Health

Commitment in COP21 Paris Convention

Reduce Co2 levels by 33% of 2005 Levels by 2030

Less Cost Burden to the Consumer

Safe to Use

Uninterrupted Supply

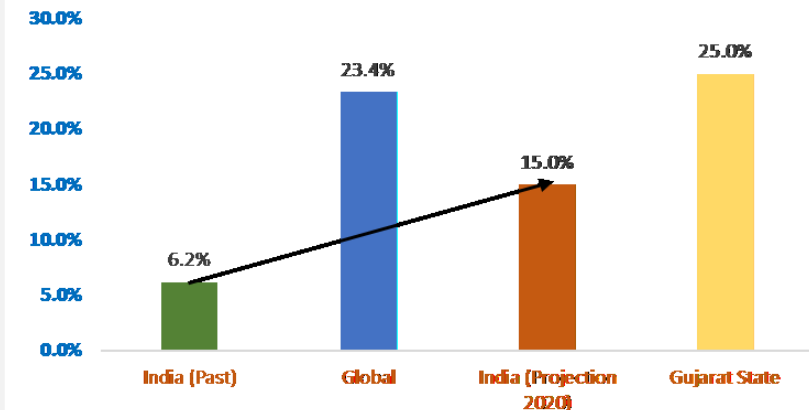
Plug Distribution Leakages

Reaches the Masses

Policy Thrust at Government Level

- ❖ Regulatory Interventions;
 - Promote CNG in Public Transport
 - Ban Pet Coke & Furnace Oil
- ❖ Domestic Gas Allocation (PNG)-Domestic & (CNG) – Transport
- ❖ CGD granted “PUBLIC UTILITY” Status in India
- ❖ Facilitation of City Gas Distribution Network by State Govts.
- ❖ India’s Aim to cater **10 Million** Houses with Clean PNG -2020

Natural Gas Share in India's Energy Basket



Present Status of CGD Infrastructure in India and Future Leap

	Till June 2019	Projection after 9 th & 10 th Bid	Leap (%)
Domestic PNG Connections	55,96,155	423 Lakhs	86%+++
Commercial PNG Connections	28,417		
Commercial PNG Connections	9,024		
CNG Stations	1758	8181 Stations	21.5%+
Steel Pipeline Infra. (Inch-km)	50,216	1.74 Lakhs	29%+
MDPE Pipeline Infra. (Inch-km)	1,16,158		



CGD PLAYERS IN INDIA



Maharashtra Natural Gas Ltd.
(A JOINT VENTURE OF GAIL (India) Ltd & BPCL)

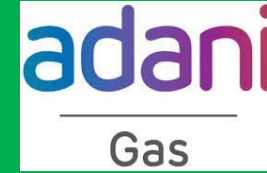


INDRAPRASTHA GAS LIMITED
an ISO 9001, ISO 14001 & OHSAS 18001 certified company



GIS

NEED OF THE HOUR





GIS IMPLEMENTATION FOR CGD (A NEED)

- **Geocoded Assets** are easy to Track, Reach and Control
- **Maximize Resource Utilization** through Fast and Better Planning
- **Geospatial Search** for Affected **Downstream Consumers** (Domestic/Commercial/Industrial)
- High probability to **link with SCADA**
- **Effective Management** of Laid/To Be Laid Gas Network Assets on Ground for Steel and MDPE
- Regular **Monitoring, Repair** and **Maintenance** reflection on a GIS Platform
- **Improve Asset Quality** and **Safety** through Automated Flagging in GIS *(Now this required Smart GIS Data Model)*

A CGD COMPANY

it'll pay off later.



Challenges in GIS Implementation for CGD Companies

- Lack of **Geospatial Literacy** for CGD
- The BIG Questions **How**, **Where** and **When** to Start
- Forced Acceptability & Adaptability to the **New GIS Working Environment** for CGD Team by **Regulators**
- Availability of **Trained GIS Resource** with a knowledge of CGD Company and its working
- Decision on Hardware (Servers and Work/Stations) and Software **(Open Source/Proprietary) ?**
- Understanding **GIS Implementation from the Basics**



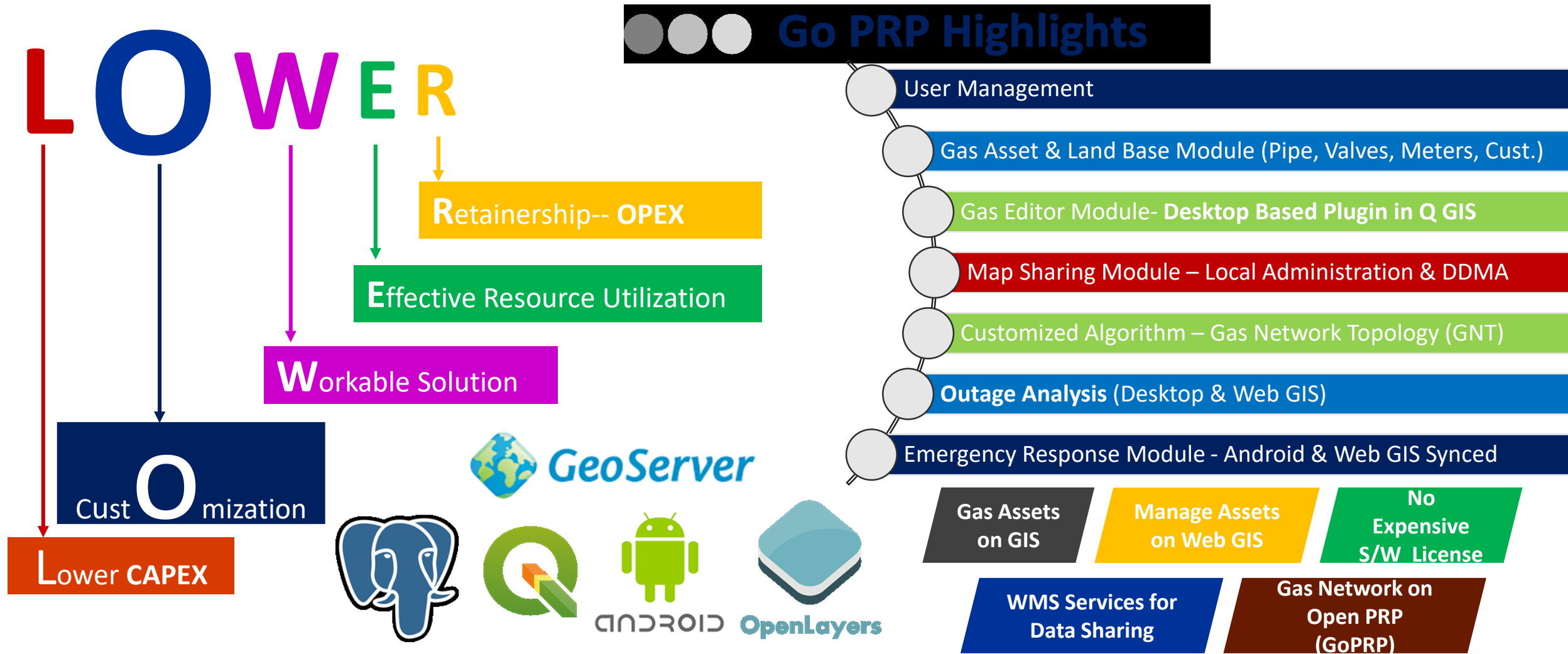
MARKET OPTIONS AVAILABLE IN INDIA

Parameter What CGD Companies Look At	ESRI Solution <small>(Proprietary)</small>	GE Product <small>(Proprietary)</small>	GoPRP Solution <small>(Open Source)</small>
Pricing	High Price Structure for Server License; Desktop Licenses additional, Extra tools with separate license cost	Base software augmented by separate licenses	Economical – One Time Development Cost as per CGD requirement. All-in-one Solution (Desktop , Web Server, Android)
Setup & Admin for the GIS System	User manuals provided . Cloud Hosting at high additional cost also available	Relatively complex. Cloud hosting available	Simple . Annual Hosting service economical ; Client need not bother about setup & infrastructure (SaaS Model)
S/W Utilization Potential	Purchasing additional capabilities that will never or rarely be utilized is wasteful and seriously contributes to what will most likely be an already-substantial investment		All critical Tools are available . (90% of Times tools used) New Requirement can be developed
Customization Support	Tedious Process. At high additional cost	Tedious Process. At high additional cost	Yes . Reasonable mutually decided cost
Day-to-day Support	Dependent on Local Implementation partners. At additional cost		Fast Response & availability . Covered in AMC services
Bug Fixing	Waiting for New Release by the concerned company; higher customization /development cost; need to retain a permanent team for GIS Development..... HIGHER-----		Fix it yourself through handholding process or through additional services
Product Maturity	Yes	Yes	Relatively New but highly Agile
Adaptability	Higher CAPEX and OPEX (Keeping smaller CGD Companies at Bay) HIGHER-----		Leverages on Lower CAPEX and Distributed OPEX (Big and Small CGD's) Loving it. It fulfills 90% of their CGD Work using GIS.



Gas on Open PRP – GoPRP

A New Normal for CGD Companies in India





GoPRP – Success Stories

- **Gas Asset Data available in**

- Non –GIS Format
- Hard Copy Maps
- Auto CAD Drawings

- **Lack of Traditional Knowledge for Pipeline & Assets**

- **Dependency on Human Resource High**

- **Breach in Gas Pipeline**

Segment, CGD Entity used to take **minimum half a day** to find out **end customers** (Domestic, Commercial & Industrial)

- **Data Sharing of Gas Asset to Local Authority, District Disaster Management Authority- A Huge Issue**

- **3rd Party Data Sharing**
Untimely/ Non-confirmative data (hardcopy maps)

- **Traditional Knowledge Mapped on GIS**

- **Human Dependency Reduced**
- **Inventoried Assets & Pipeline in GIS**
- **View/Query/Search Assets & Status**

- **Outage Analysis Tool**

Helps in Identifying SR, Commercial & Industrial Consumers, Domestic Consumers in **(30 sec to 45 min)**

- **Provisioned to Link with SAP**

- **GoPRP has helped in Smooth & Restrictive data Sharing**

- **OCG Compliant Datasets like WMS can also be shared**



Sabarmati Gas Ltd.
(A Joint Venture of GSPC and BPCL)



SHOLAGASCO
An IMC Group Company



Goa Natural Gas Pvt.Ltd.
A Joint Venture of GAIL Gas Ltd & BPCL





GoPRP – Development Inhouse



Gas Suite



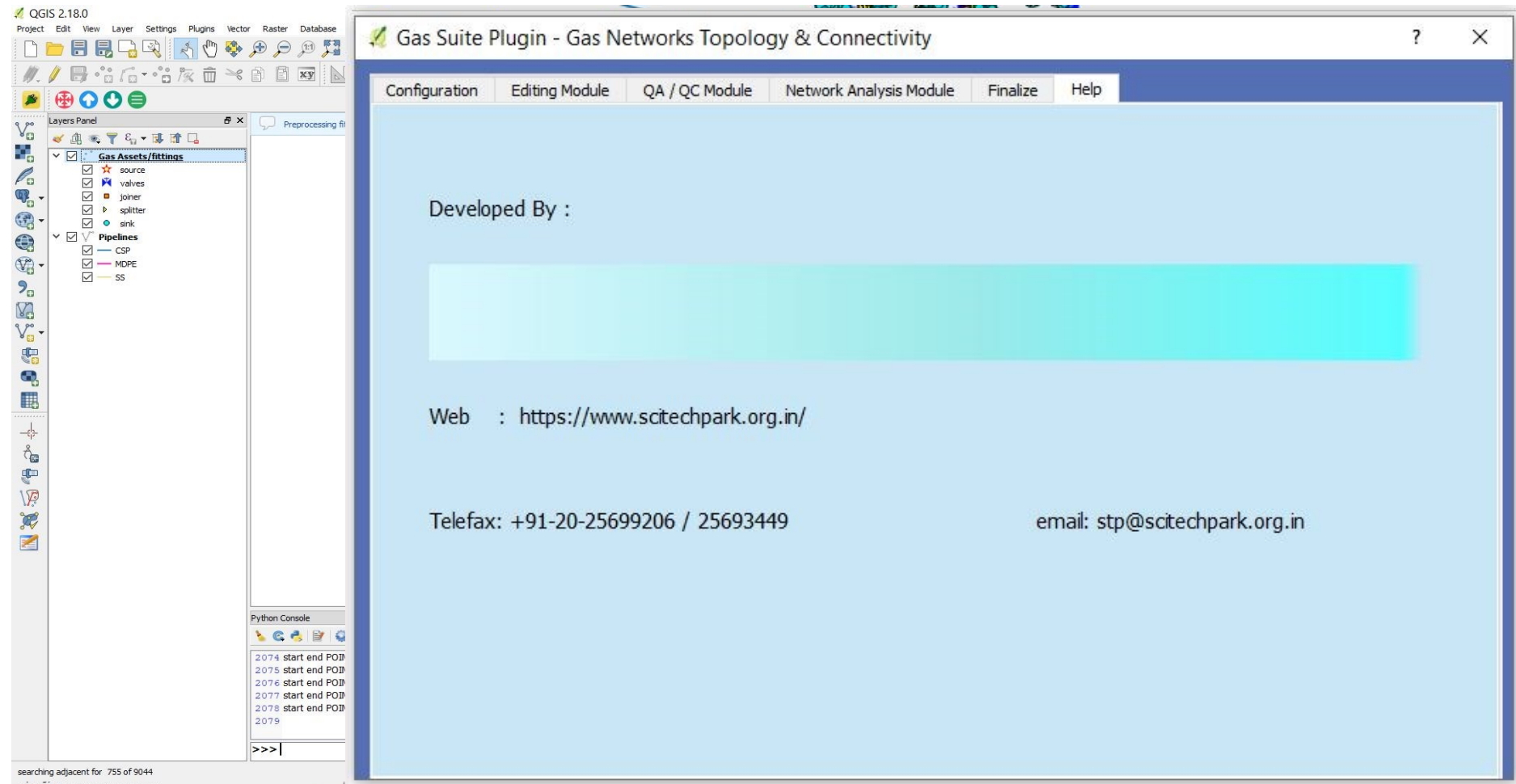
Downstream Analysis



Upstream Analysis



Valve Isolation





GoPRP – Live System

https://stpprojects.openprp.in/scitech_presence/



Thank You

Please Contact us at:

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