



IHS Markit™

Energy Infrastructure and Markets

Database: North American Midstream Essentials

Comprehensive transportation, processing and markets infrastructure data for prospect screening, project development and new plant siting for Canada, USA and Mexico

For stakeholders all along the energy chain from the wellhead through to the end-user, from Canada through the USA and on into Mexico, a firm understanding of infrastructure issues has become a key component to success. North American Midstream Essentials provides the critical information needed to ensure that there are no missing links in our clients' operating decisions and business plans in this dynamic, opportunity rich region.

Midstream Essentials provides the intelligence needed to support:

Prospect/Play Analysis

- The presence of a pipeline network adjacent to a prospect can be readily identified, mapped and its capacity quantified.
- The likely ease of access to processing facilities including gas plants, LNG liquefaction and refineries can be assessed.
- Thus additional investment in infrastructure to monetize production and the potential impact on project economics can be scoped.

Oil, Gas and NGL Marketing

- Potential markets for natural gas and gas liquids production in the power, petrochemical and industrial sectors can be identified by facility location, size and operating company.
- Additional details on historic gas, diesel, fuel oil and coal usage are available for major industrial facilities in the United States.
- For crude oil, refinery complexity with processing kit details by

facility is provided to determine the best match with its quality.

Investment Opportunities and Plant Location Siting

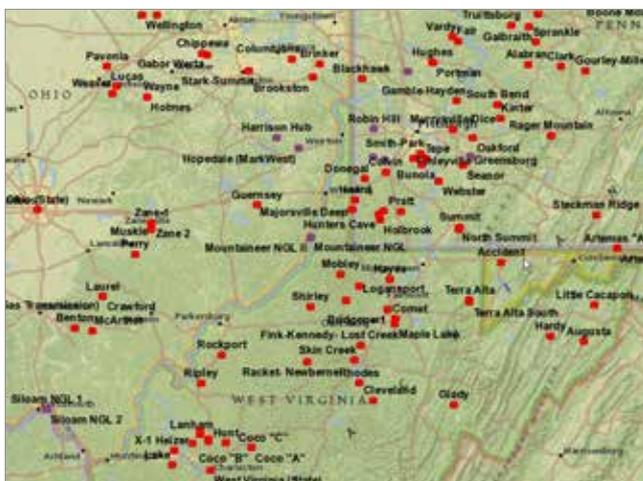
- The need for new plant investment can be best analyzed by mapping all existing and proposed midstream infrastructure upstream and downstream in a target area.
- The desirability of a specific plant location can be evaluated by mapping pipeline connections to feedstock and fuel supply options accessible today and when new projects come online.
- The dependencies of the feedstock supply on associated infrastructure such as gas processing plants and refineries can be identified, as well as alternative outlets for the feedstocks and fuel.
- Proximity to import/export port terminals and storage facilities can be viewed and the site's vulnerability based on elevation and distance to coast can be assessed.
- Key phases in the project life cycle are captured in the construction status.

Competitor Intelligence & Joint Venture Assessment

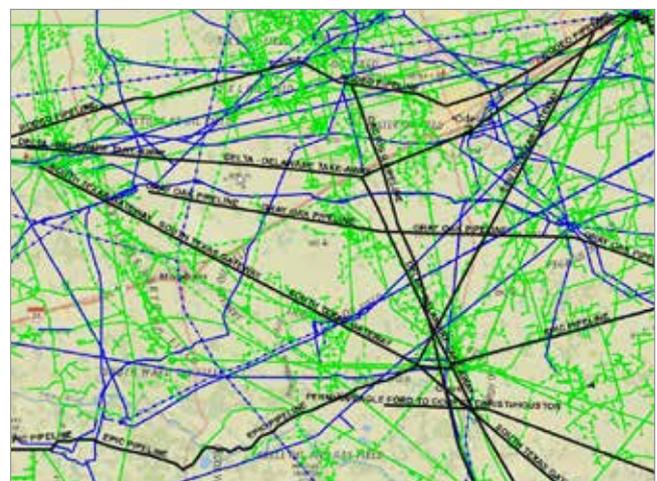
- The strategic position of a competitor based on its infrastructure holdings and the dependencies of the assets upstream and downstream can be evaluated.
- By mapping the assets of two companies in tandem, potential synergies with respect to feedstock supply, processing and/or product transport can be best identified in support of the formation of joint ventures.

Online Database with Mapping

- "A picture is worth a thousand words", all facilities can be queried and displayed in a map reflecting the user's criteria.
- All links in the energy chain, the transport, processing and primary markets' infrastructure can be viewed via one database in a consistent format.
- Thus the time spent gathering data can be substantially reduced and refocused on the implications of the information to business decisions.



Utica/Marcellus natural gas and gas liquids storage facilities



Permian play crude oil pipeline projects highlighted in black

Common attributes for all facility types are plant name, operator, ownership structure, capacity by unit, online date by unit and location coordinates

As well as existing facilities, projects are captured along with their current status and milestones for key events. The content is outlined in the following:

Pipelines:

- Content
- Type of pipeline
- Operator
- Route & length
- Diameter
- Capacity
- Online date
- Throughput by entry/exit node for natural gas

Compressor & Pumping Stations:

- Type
- Capacity
- Horsepower
- Input and output pressure

Storage Facilities:

- Type of storage
- Storage volume (Gas):
 - Working gas
 - Cushion gas
 - Total
- Installed compressor power MW
- Total volume (Liquid)

Floating Production Storage & Offloading (FPSO)

- Field name
- Port name
- Construction type (new or converted)
- Mooring Type
- Deadweight tonnage
- Depth
- Length
- Oil production maximum
- Oil storage capacity
- Gas processing capacity
- Gas injection capacity

Gas Processing Plants:

- Gas intake capacity
- Production capacity:
 - Ethane
 - Propane
 - Normal butane
 - Iso-butane
 - Mixed butanes
 - Natural gasoline
 - C5+
 - Condensate
 - LPG
 - NGL
 - Total

LNG Liquefaction & Regasification Facilities:

- Capacity holders
- Storage capacity
- Number of tanks
- Technology
- Capital cost

Refineries:

- Capacity by unit (bpd and tons/year)
 - Crude distillation
 - Vacuum distillation
 - Reforming
 - Catalytic cracking
 - Hydrocracking
 - Coking
 - Thermal cracking
 - Visbreaking
 - Hydrotreating
 - Alkylolation
 - Isomerization
 - Polymerization
 - MTBE
 - ETBE
 - TAME
 - Lubes
 - Asphalt
 - BTX extraction
 - Hydrogen
 - Sulfur

Biofuels/Synfuels:

- Type
 - Biodiesel
 - Bioethanol
 - CTG
 - GTL
- Intake capacity
- Production capacity:
 - Ethanol
 - Diesel
 - Naphtha
 - LPG
 - Other products
 - Total liquid product
- Gas

Ports:

- Capacity Berths:
 - Berth name
 - Type of service
 - Operating status
 - Depth
 - Length
 - Maximum length overall
 - Maximum draught
 - Maximum dead weight
 - Tonnage

Power Plants:

- Plant type
- Capacity by unit & turbine type
- Primary/alternative fuel by unit

Methanol, Ammonia and Urea Fertilizer:

- Product output capacity
- Plant type
- Plant capacity

Olefin Plants:

- Ethylene production capacity
- Feedstock usage by type (percentage)

Other Large Industrial Plants:

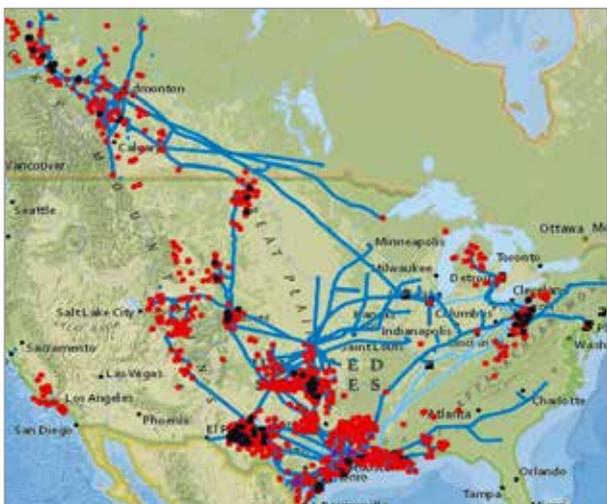
- Industrial type
- Plant production capacity
- Estimated gas consumption at full capacity

Gas Contract & Distribution Structures:

- Gas pipeline and LNG supply contracts
 - Supplier & Buyer
 - Time period
 - Plateau volume
- Gas customer profile
 - Customer type
 - Number
 - Time period
 - Sales volume



Tuxpan terminal expansion plans



Gas processing plants in red (projects highlighted in black) and NGL/LPG pipelines in blue (projects highlighted in light blue)

Modules available in the Energy Infrastructure and Markets Database suite of products include:

Global Midstream Essentials: Midstream Essentials content coverage is available worldwide as well as on a regional basis.

E&P Essentials: Midstream Essentials can be readily integrated with IHS Markit upstream exploration and production data.

Global Oil Midstream Database: Comprehensive unit processing and production capacity information.

Global Gas & Power: Comprehensive unit level electric plant and gas storage level information

All infrastructure data is map able and accessible through IHS Markit's GIS products.



Natural gas fired power plant in green (projects highlighted in black)

Coverage of **90,000** facilities globally 

 More than **3.5 million** km of pipeline information

More than **8,000** sources of information 

 Over **75,000** man hours per year spent maintaining the database

About IHS Markit

IHS Markit (Nasdaq: INFO) is a world leader in critical information, analytics and solutions for the major industries and markets that drive economies worldwide. The company delivers next-generation information, analytics and solutions to customers in business, finance and government, improving their operational efficiency and providing deep insights that lead to well-informed, confident decisions. IHS Markit has more than 50,000 key business and government customers, including 85 percent of the Fortune Global 500 and the world's leading financial institutions. Headquartered in London, IHS Markit is committed to sustainable, profitable growth.

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