



ZEMA

ZEMA AND LNG

**What ZE and ZEMA can do for LNG
Market Participants**

About ZE PowerGroup

ZE has over twenty years of experience delivering Enterprise Data Management software solutions that are tailored for global multi-commodity trading organizations.

We have converted many clients from competitive or home-grown systems and provided not only a more robust and scalable solution, but also cost savings, higher efficiency, and greater capability / functionality. The feedback from these customers is that ZE invests more in its clients, its products, and the overall return on investment is significantly higher.

Due to the modular and flexible nature of the ZEMA platform, there is a great amount of flexibility in terms of how ZEMA can be deployed for each client, and ZE works closely with our clients to ensure that their ZEMA systems grow in tandem with their businesses to ensure that their data management needs are always fully supported.

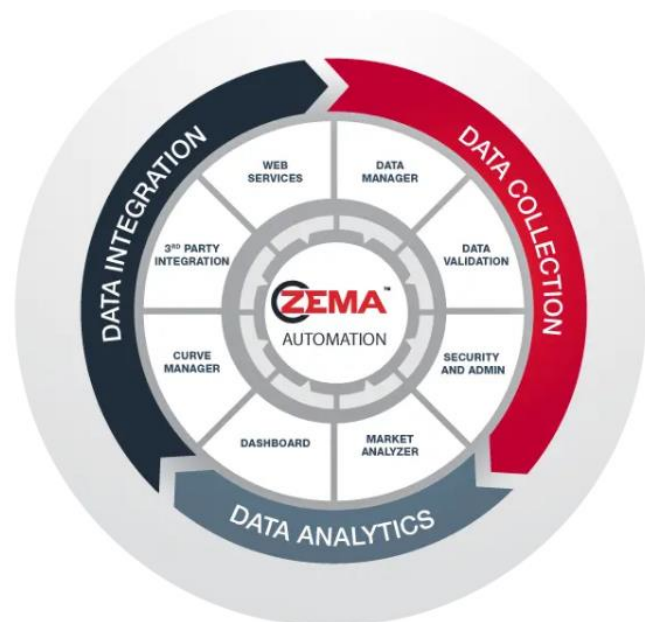
ZE has implemented over 200 ZEMA-driven solutions of varying complexity for well over a one hundred customers in the Gas, Power, Oil, Finance, and other related industries. ZE does not leverage third-party implementation partners, ensuring each Solution / project is delivered to a high-standard and in accordance with best-practices. Working directly with our customers has helped shape and enhance the ZEMA Platform and ensured its functionality has evolved to meet the demands and requirements of our customer base. With so many successful solutions delivered to such a targeted industry, ZEMA has organically grown to support the vast majority of customer requirements out of the box.

ZEMA – Data Management for Commodities

ZEMA is a suite of modular applications that focus on key competencies to provide the most comprehensive and configurable end-to-end enterprise data management solution:

- **Data Collection, Quality and Validation**

The scheduled collection, storage, and standardization of public and private data. Includes validation and assurance of data integrity, as well as the administration and authenticated access control of the data.



- **Data Storage**

Once data has been collected, validated and cleansed, the data is persisted and stored in the ZEMA database, which is available to end-users and external target systems for downstream processes.

- **Analytics and Presentation Layer**

The extraction of information through the formulation of simple or complex queries with the ability to view the data in powerful visualizations and dynamic spreadsheets.

- **Transformation**

The modeling and persistence of custom data sets based on formulas, data blending, mapping, derived series, custom properties, and re-descriptions.

- **Integration**

The integration of data and analytics with a broad spectrum of downstream 3rd party-systems. This is accomplished through the use of ZEMA adaptors or ZE's development tools (web service layer).

Simplifying and Automating the Complex for LNG Clients

LNG is a complex industry. With ever changing flows, maintenance cycles, price volatility and freights, LNG participants need to understand the complex nature of data and turn this into actionable insights. These then need to be transacted on, and dispersed to various teams, including front, mid and back-office functions, and systems. This is exactly what ZEMA does for many of the largest LNG corporations in the world. We are a trusted partner of LNG companies, and our clients in this space include **23 of the world's top LNG companies**, including **5 of the largest 6 LNG companies globally**.

LNG Market Data

The previous clients represents the majority of worldwide LNG flow, including 5 of the 6 largest public LNG companies, and many of these have been ZEMA users for over ten years. ZEMA collects a wide variety of data for these clients, from freight and shipping traffic, to rates, prices, indexes, forwards, and options. All this data is centralized in a warehouse that is the clients' intellectual property.

These large LNG market participants can then use this data to map and transform these into required curves, calculations, and indexes, and integrate this seamlessly to downstream systems, including BI and mathematical tools, and ETRMs/CTRM.

ZEMA has the largest and widest data catalog on the market, collecting all the external, 3rd-party, public, vendor or internal data sets these clients require:

ZEMA Market Data

1,300 +

Market Data Providers

15,000 +

ZEMA Reports

Largest Catalog on the Market

- Breadth of data available
- All major data providers, whether Public/Private/Vendor/Internal
- Quickest time to integrate new sources (2-4 weeks)

Data Expertise

- Broad, flexible data model for simple or complex data requirements
- Incorporate very different data sources into ZEMA easily
- Custom client solutions and/or processors/views
- Our teams take care of all considerations, design and governance, Market data services, development, delivery and maintenance

Calculations for LNG

With the data collected, ZEMA allows these clients to transform data into specific curves and calculations. Some examples of these for the LNG industry would be a spot rate with an extrapolated forward curve, seasonal analysis of pricing, combination of indexes and freight rates, and others.

ZEMA allows users to create dynamic profiles, which are saved logical queries, transforming raw data (such a settlement prices) into curves. These curves can be time-series, forwards, or options curves. These curve objects can then have the clients' own naming conventions, metadata, and properties (custom semantic layer). This curve layer normalizes and attributes data into the specific business requirements for clients.

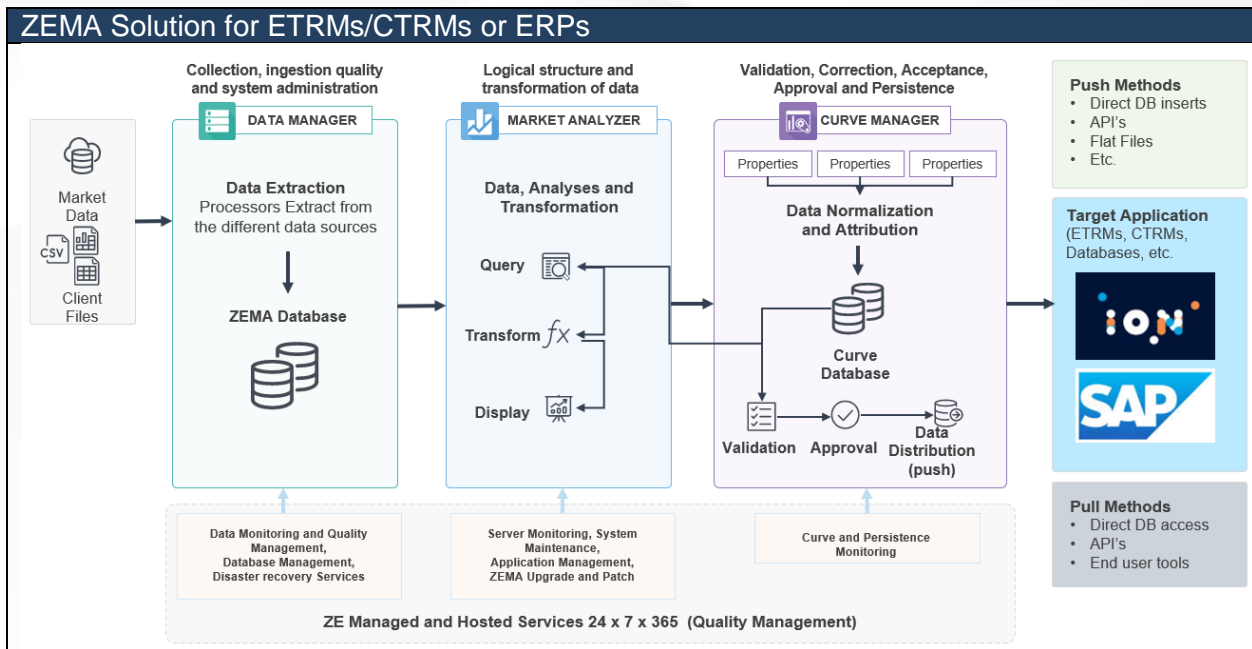
Following is an example of an arbitrage-free blended curve, which combines data for monthly, quarterly, and annual contracts into a single curve of monthly tenors.

Arbitrage Free Blend in ZEMA				
Date	Mth_Curve	Qtr_Curve	Cal_Curve	Blended_Market_Curve
	Forward Analysis: Type: Forward Curve Contracts: Single - Monthly Date: 12/14/2022 (Relative	Forward Analysis: Type: Forward Curve Contracts: Single - Quarterly Date: 12/14/2022 (Relative	Forward Analysis: Type: Forward Curve Contracts: Single - Annual Date: 12/14/2022 (Relative	
All	All	All	All	All
1	October 2022	14,410.000		14,582.279
2	November 2022	14,410.000		14,582.279
3	December 2022	14,410.000		14,071.000
4	January 2023	10,425.000	9,494.000	10,425.000
5	February 2023	7,646.000	9,494.000	7,646.000
6	March 2023	10,411.000	9,494.000	10,411.000
7	April 2023	10,657.000	12,496.000	10,657.000
8	May 2023		12,496.000	13,400.426
9	June 2023		12,496.000	13,400.426
10	July 2023		17,332.000	17,332.000
11	August 2023		17,332.000	17,332.000
12	September 2023		17,332.000	17,332.000
13	October 2023		16,732.000	16,732.000
14	November 2023		16,732.000	16,732.000
15	December 2023		16,732.000	16,732.000
16	January 2024		8,929.000	8,929.000
17	February 2024		8,929.000	8,929.000
18	March 2024		8,929.000	8,929.000
19	April 2024		11,636.000	11,636.000
20	May 2024		11,636.000	11,636.000
21	June 2024		11,636.000	11,636.000
22	July 2024		14,382.000	18,436.940
23	August 2024		14,382.000	18,436.940
24	September 2024		14,382.000	18,436.940
25	October 2024		14,382.000	18,436.940
26	November 2024		14,382.000	18,436.940
27	December 2024		14,382.000	18,436.940

ZEMA Integration Capabilities

Once data is configured into the appropriate logical structure, such as the above blended curve, ZEMA’s Curve Manager can map this into curves for consumption by specific downstream systems. In fact, this whole process can be automated and event-driven upon consumption of the required input data by ZEMA. Curve Manager is the audit trail and data orchestration layer of ZEMA. Curves can have data written into them either via ZEMA profiles with underlying dependent data, or via external sources, such as upload from Excel or our write-based APIs.

Below describes the architecture of ZEMA, as well as our services for our clients that collects, transforms, and maps data for ETRM/CTRM consumption, while we monitor from data ingestion to persistence to the ETRM/CTRM on the clients’ behalf.



The Complete Solution for LNG

ZEMA is the complete solution for LNG companies. It collects, transforms, maps, and integrates required data sets to downstream ETRM/CTRM in a seamless and automated manner. Take the manual processes out of your critical data management and let us simplify your complex business through a ZEMA Solution today.

**Book a discovery with our Solutions team and start the journey
from the complex to simple today!**

<https://www.ze.com/about-us/book-a-discovery/>



ZE PowerGroup Inc. (ZE)

130-5920 No. Two Road, Richmond, BC

Canada, V7C 4R9

1-866-944-1469 (Toll Free North America)

604-244-1469 (BC local)

info@ze.com

www.ze.com

