C3.ai

# AI for Energy Management

## Optimizing Energy Consumption of Large Public Facilities in Italy



ENGIE deployed C3.ai Energy Management™ in Italy to enable large municipal and commercial customers to analyze energy consumption and reduce energy expenditure. ENGIE configured C3.ai Energy Management with custom analytics, data integrations, and complex asset hierarchies for their customers using the development tools on the C3 AI Suite.

C3.ai and ENGIE partnered over the course of 16 weeks to implement C3.ai Energy Management as the "Clara Domus" solution for more than 600 public facilities in Northern Italy, in response to a business need identified by the Italian Ministry of Economy and Finance (MEF). In the next phase, ENGIE Italy is expanding Clara Domus to thousands of facilities to benefit cities and other public customers.

## Project Scope

- 1 application
- 600+ facilities
- 140 key performance indicators
- 2,000 IoT devices providing streaming data to C3.ai
- 13 unique source systems provide data to C3.ai

## About ENGIE

- 114 GW of power production capacity
- €65B annual revenue
- 150,000 employees globally
- #1 power producer in the world
- #1 supplier of energy efficiency services in the world
- Active in 70+ countries

## ENGIE–C3.ai Partnership

**70+**

trained ENGIE resources on C3 AI Suite

**20M+**

facilities analyzed by C3.ai Energy Management across residential, SMB, and enterprise

**4M+**

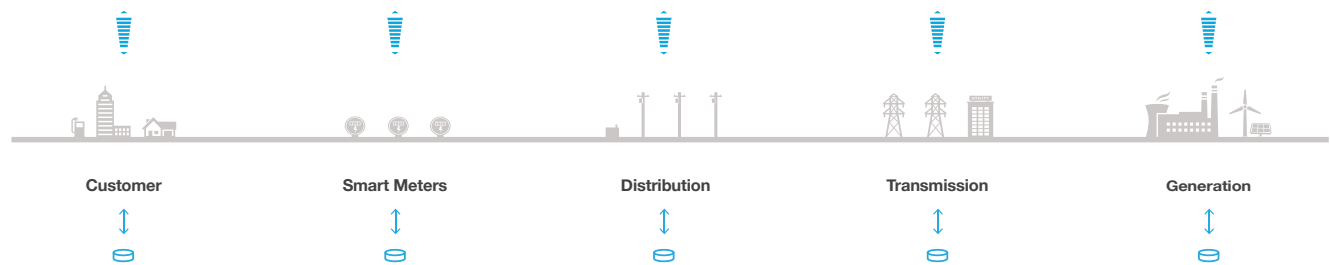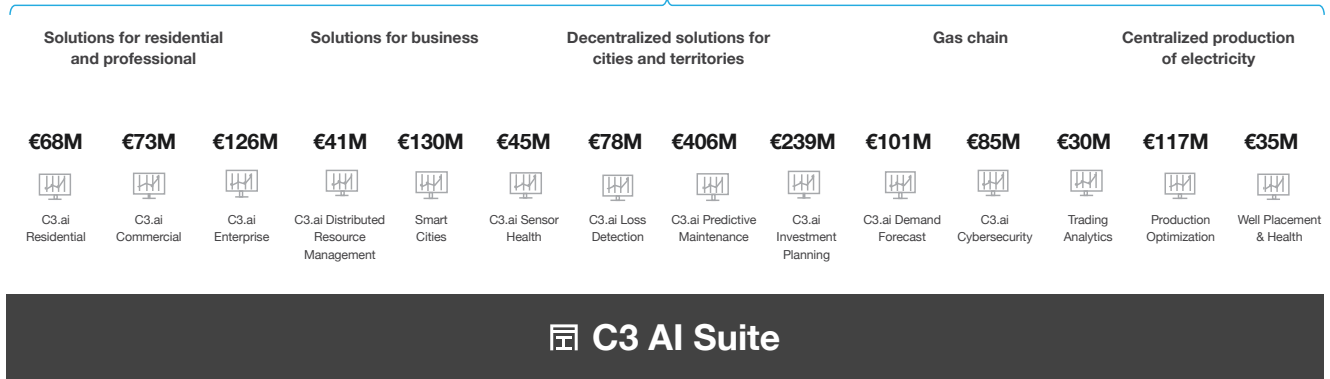sensors from 19 countries feeding data to C3 AI Suite for AI use cases

**10+**

applications in production or under development

# Across All Lines of Business, ENGIE Can Achieve €1.5 Billion per Year in Economic Benefit from C3.ai Applications and the C3 AI Suite

ENGIE is the #1 independent electricity provider in the world, #1 energy efficiency services provider in the world, #1 distribution network in Europe, and #1 green electricity supplier in France. ENGIE's revenue in 2018 was €61 billion, and it has 150,000+ employees in 70 countries.

In 2016, ENGIE selected C3.ai as the AI platform to enable its three-year digital transformation strategy. ENGIE uses the C3 AI Suite to integrate data, develop, deploy, and manage applications (including C3.ai Energy Management) across ENGIE's 24 business units to solve critical use cases.

## 5 Lines of Business

| Solutions for residential and professional | | | Solutions for business | | Decentralized solutions for cities and territories | | | | Gas chain | | Centralized production of electricity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| €68M | €73M | €126M | €41M | €130M | €45M | €78M | €406M | €239M | €101M | €85M | €30M | €117M | €35M |
| C3.ai Residential | C3.ai Commercial | C3.ai Enterprise | C3.ai Distributed Resource Management | Smart Cities | C3.ai Sensor Health | C3.ai Loss Detection | C3.ai Predictive Maintenance | C3.ai Investment Planning | C3.ai Demand Forecast | C3.ai Cybersecurity | Trading Analytics | Production Optimization | Well Placement & Health |

## C3 AI Suite

| Customer | Smart Meters | Distribution | Transmission | Generation |
|---|---|---|---|---|

# The Challenge: Differentiate Energy Services Offering with a Configurable and Scalable AI Energy Management Platform

For large public entities such as cities, the ENGIE Italy business unit provides energy services, including billing management and energy efficiency. ENGIE deployed C3.ai Energy Management for their Clara Domus solution to deliver greater energy savings for their customers.

In addition to granular analysis of energy data, Clara Domus had specific requirements for sensor integration, customization, security, and scalability. These requirements could only be met by C3.ai Energy Management:

- Real-time integration of streaming data from ENGIE Sigfox devices and BMS systems
- High PSR (performance, scalability and reliability) requirements for data ingestion and availability
- Modeling and seamless KPI aggregation of multi-level asset hierarchy from organization down to individual room sensors
- Translatable user interface for both Italian and English

- Development of advanced analytical models for contractual measurement and verification requirements
- Customizable user interface with different dashboards and data for different customers
- Complex security requirements to control multi-level access for different types of users (e.g., third-party service providers, internal analysts) at the page, feature, and data level

# A Global Energy and Sustainability Management Solution

C3.ai Energy Management enables ENGIE energy managers and their customers' facility operators to use AI to analyze energy data, identify cost savings and performance improvement opportunities, manage contractual obligations such as comfort, and proactively take action to implement measures and verify benefits.

## Project Objectives

- Differentiated service offering with a configurable and feature-rich technology solution
- Rapid deployment to meet customer deadlines
- Scalable energy management platform to expand business to new customers in Italy and to other business units across ENGIE

## Benefits

- Additional revenue from new products and services
- Increased customer retention
- Improved customer satisfaction
- Reduced cost of energy efficiency obligation

## Project Highlights and Results

- Deployed the solution to 600+ facilities in 16 weeks, on time and to specification
- 600+ public facilities in Northern Italy
- Achieved 50% additional savings (compared to alternative solutions)
- Identification of up to 10x energy reductions for worst performing facilities
- Modeled and analyzed a multi-layered hierarchy ranging from city aggregation down to individual building asset sensors

- Delivered a strong strategic advantage as evidenced by the City of Venice's recognition
- Configured data integrations on the C3 AI Suite, including custom temperature and billing feeds built by ENGIE and connections to BMS systems providing measurements such as fan coil speed and HVAC status every 15 minutes
- Configured 140 analytics for energy data such as thermal heating consumption and energy efficiency KPIs
- Provided a scalable and differentiating platform that is being expanded to new customers

## Solution Architecture
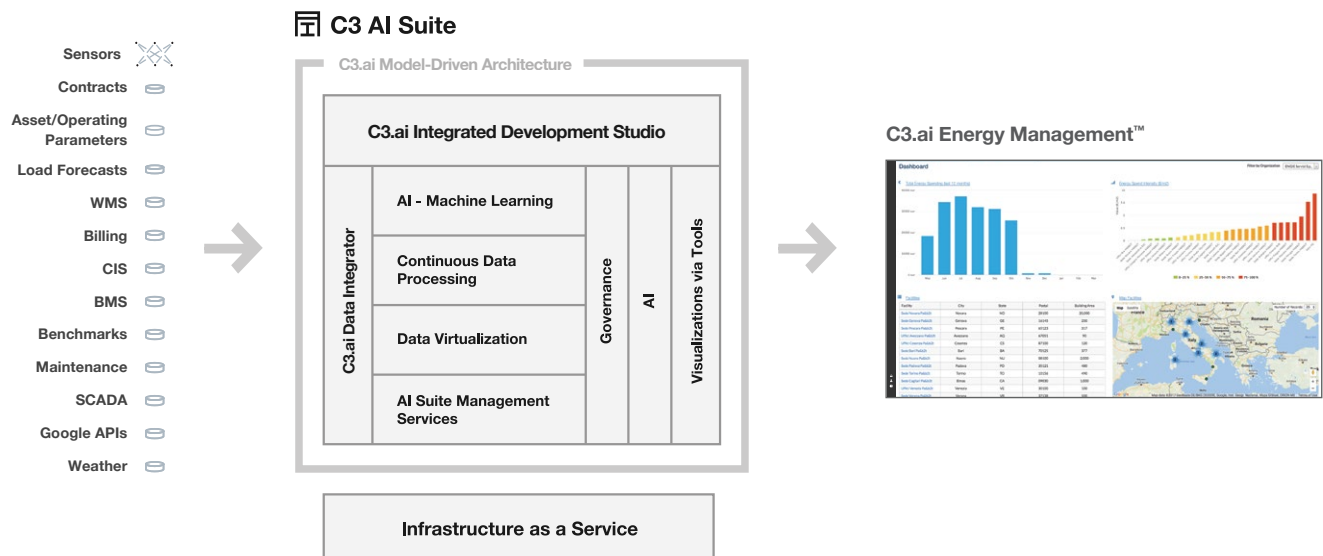
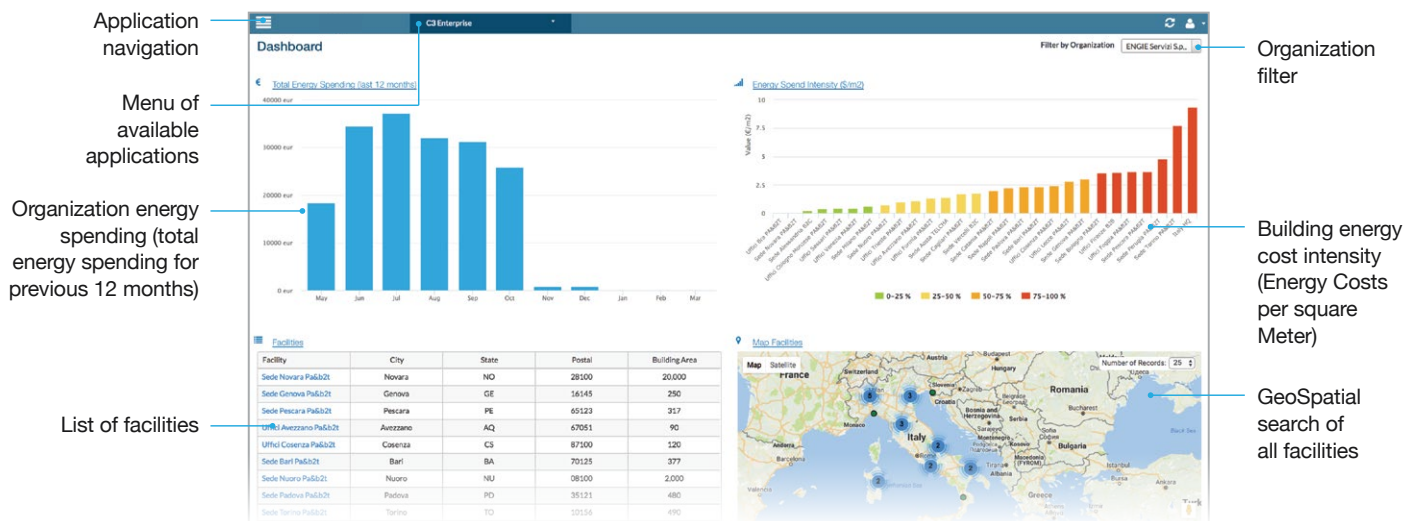# Phased Approach to Continually Enhance Solution with Joint C3.ai and ENGIE Teams in Rome, Milan, and Paris

The approach for Clara Domus was to assemble a team of joint C3.ai and ENGIE resources and use agile best practices to specify, prioritize, develop, and deploy product enhancements through project phases.

**Phase 1** consisted of implementing the out-of-the-box C3.ai Energy Management application across 35 facilities, while training ENGIE technical resources to be autonomous on the C3 AI Suite.
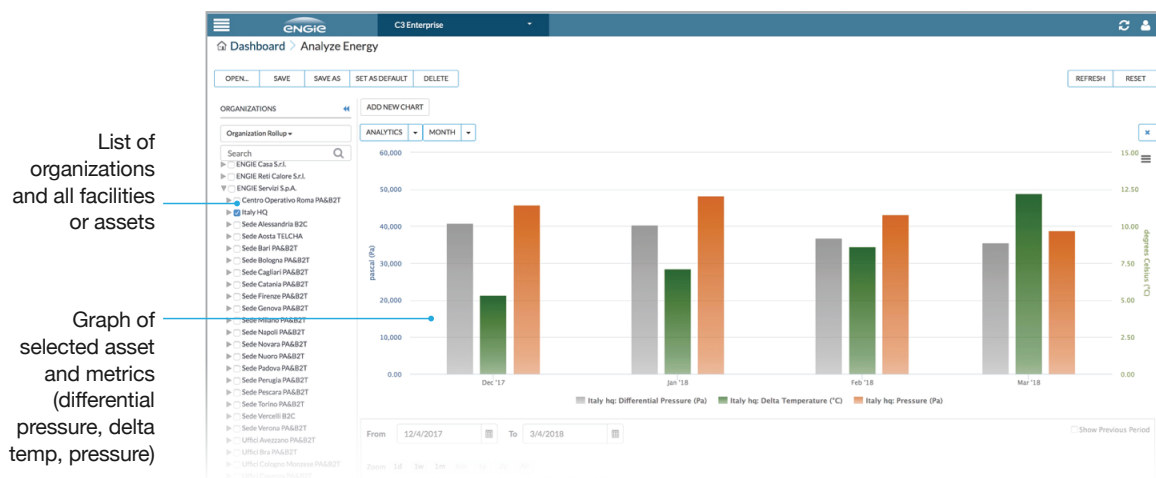
**Phase 2** expanded the solution to meet end customer requirements:

- The scope was expanded to 600+ facilities
- The UI was customized to accommodate customer requirements and specific organization arrangements
- The team built integrations and analytics for streaming data from Sigfox devices, BMS, and AWS IoT
- Additional technical resources were trained

With **Phase 3**, ENGIE is planning on implementing machine learning features that will enable closed loop control over temperature and humidity in real time.



*C3 Energy Management Dashboard for Clara Domus*

Application navigation
Menu of available applications
Organization energy spending (total energy spending for previous 12 months)
List of facilities
Organization filter
Building energy cost intensity (Energy Costs per square Meter)
GeoSpatial search of all facilities



*Analyze Energy tool in C3.ai Energy Management configured for ENGIE Clara Domus*

List of organizations and all facilities or assets
Graph of selected asset and metrics (differential pressure, delta temp, pressure)

## Proven Results in 8-12 Weeks          Visit c3.ai/get-started