HERMESBAY
enhanced awareness

Model Integration
DOMINO Project
Jnauary 2024

Domino Platform

Domino is a tool for **real-time mapping of risk factors** that could endanger networked infrastructure.

Domino performs a **risk analysis** at:

1. National level
2. Operator level
3. Geolocalized area level

It can support **CER directive implementation** at **National** and **Critical Entity** level for risk analysis as stated in article 5 and article 12.

It can support **NIS2 directive implementation** at **National** and **Essential or Important Entity** level for risk analysis as stated in article 21.

The Domino Platform

The system integrates three models
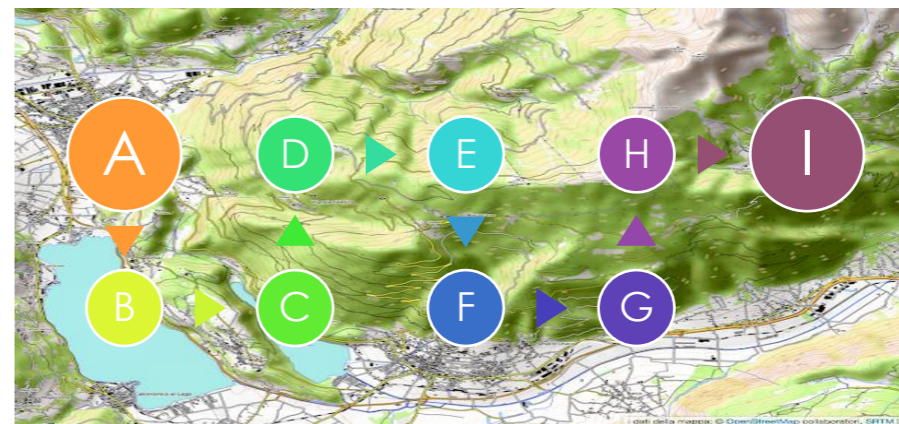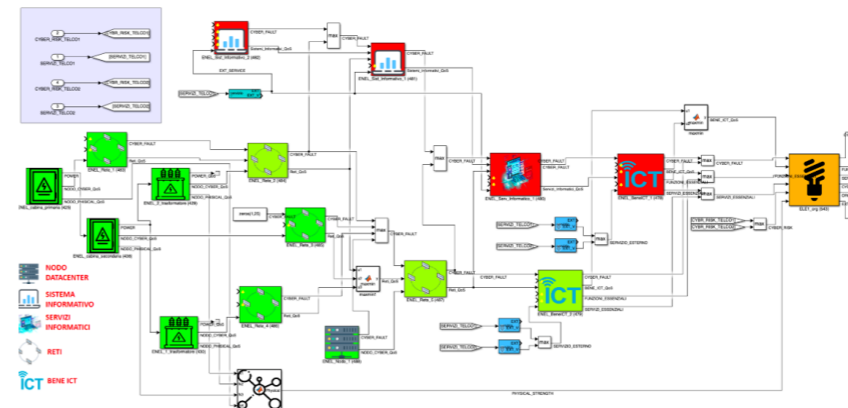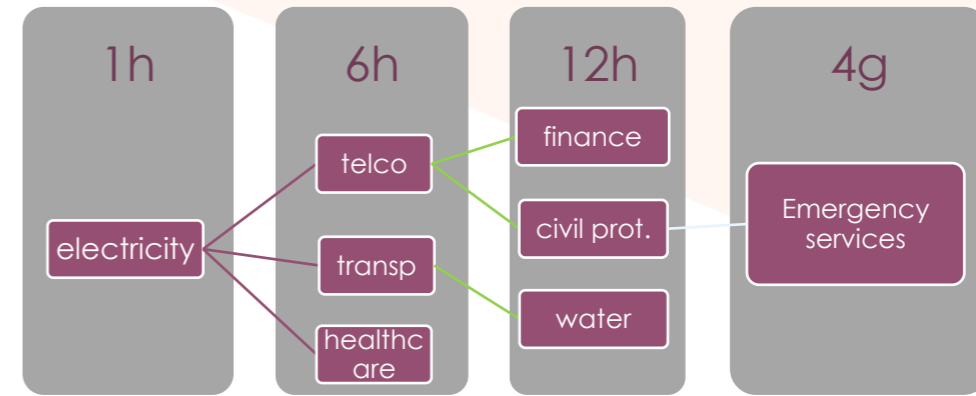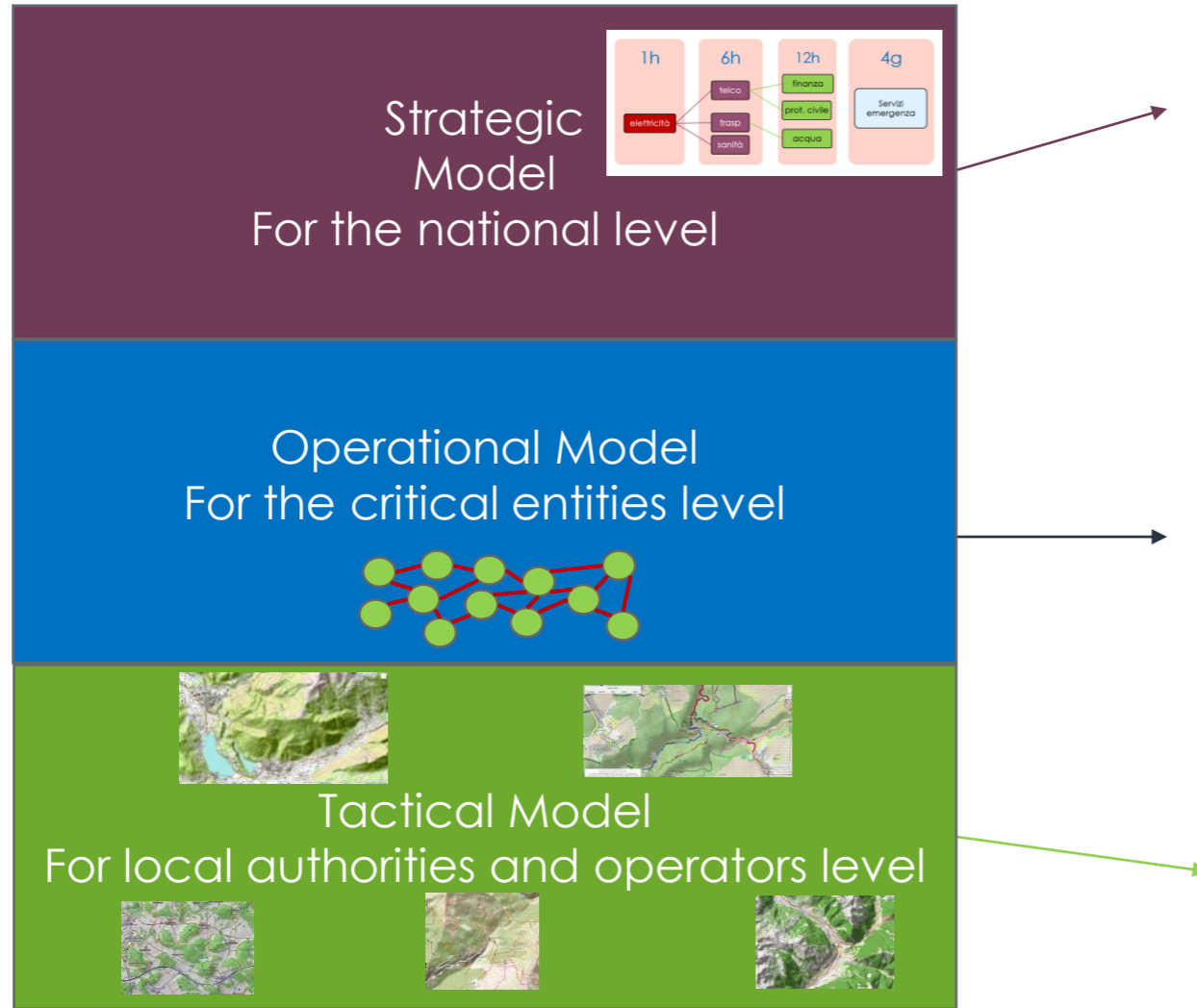
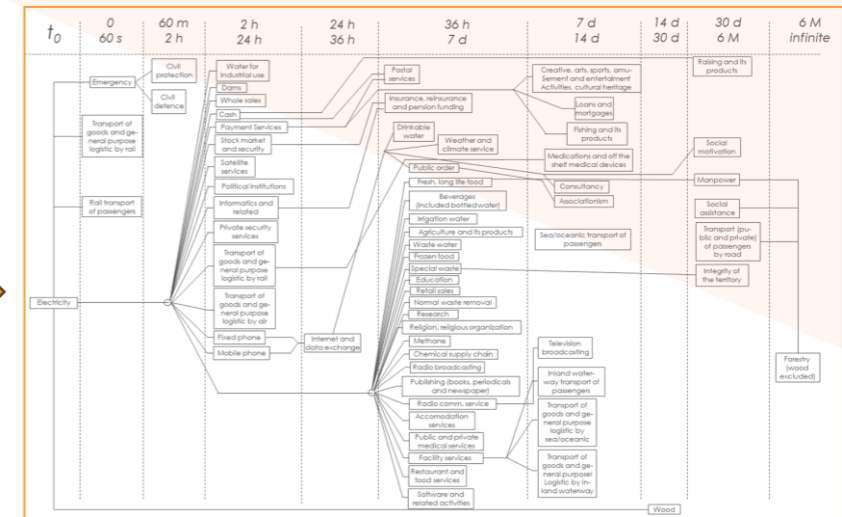# Controlled Environment for Cyber Impact Simulation
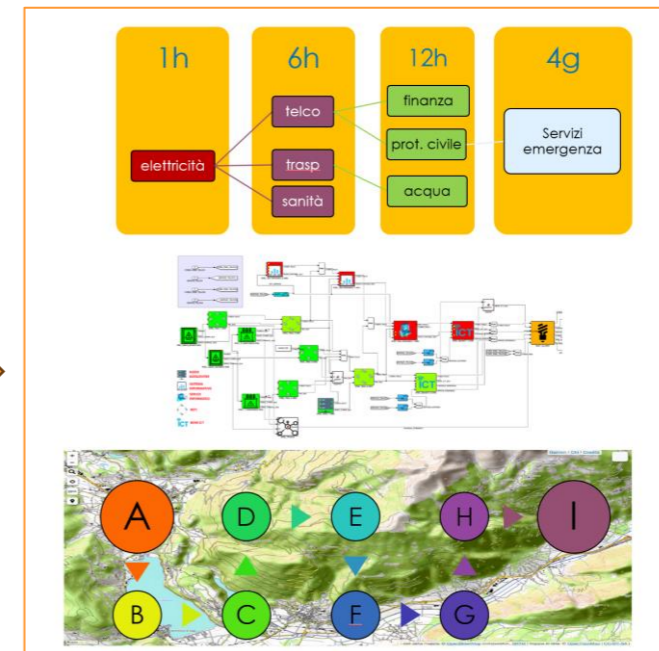
Domino is a

Digital twin

that guarantees the accuracy of responses for **operators** and **decision-makers** through:
1. REAL data
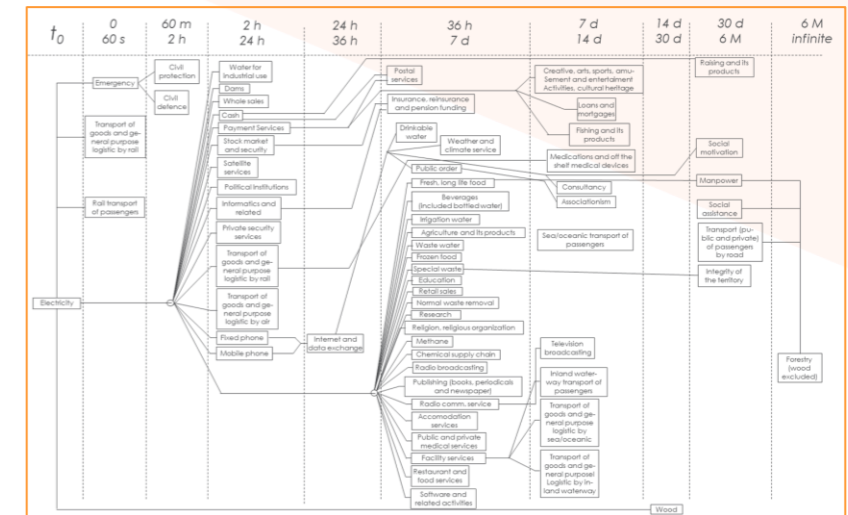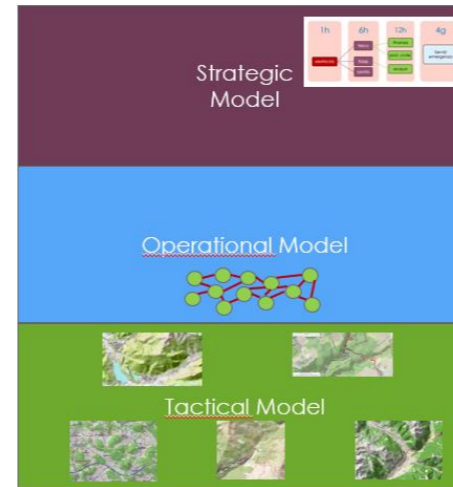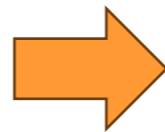2. SYNTHETICALLY generated data

Decision-makers ➡️

Operators ➡️

The Digital Twin can perform a risk analysis according to any methodology

Graphic and informative output

Examples of decision maker's inquiries we handle

EXAMPLE: Event involving electric power distribution
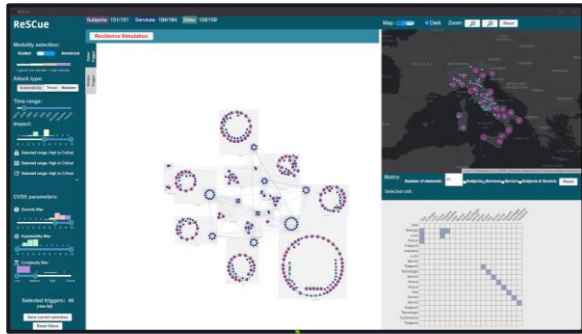
What might happen if it spreads?
Will it have functional consequences on other sectors?
Will these consequences be partial or will they shut down entirely other sectors?
How long will the sectors involved take to restart after the triggering event is over?
What will the economic impact be?
What about the social impact? And the political one?
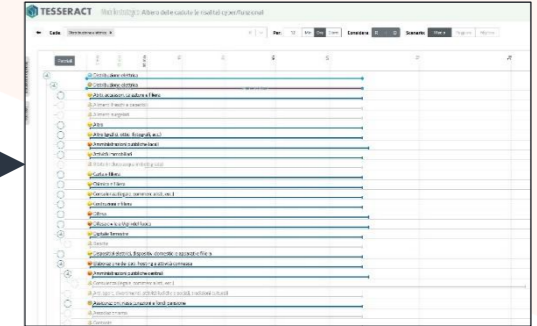
What might happen if the problem is geolocalized to small areas of a Country?
What elements of interest could be affected in each areas?
What will the economic impact be? And the social one?

What might happen to CER operators?
Which operators' asset might be affected?
How could the operational disruption spread?
What are the probabilities?

Strategic Model – graphical output

- ► **Intersectoral propagation** model of **Functional** disruptions over time at a national level
- ► Services collapse and recovery model
- ► Capability to manage crisis management evaluations
- ► Capability to perform evaluations of average, best and worst-case scenarios
- ► Capability to perform analysis on sectoral cascade effects and intersectoral domino effects

Strategic Model – numerical output

► **Impact** evaluation model:
  o **Economic impact** on each sector and at national level
  o **Reputational impact** (defined in terms of people's trust in institutions) on each sector and at national level
  o **Social impact** on citizen's quality of life on each sector and at national level

Operational Model

1. **Functional risk** evaluation model

2. The evaluation can also be automatically obtained from the ontologies of compiling subjects

3. It propagates the effects of **physical** attacks and failures to services and functions

4. The model allows to reach the granularity level of each operator's individual physical infrastructures

5. It allows to perform the risk evaluation through models that have different degrees of uncertainty
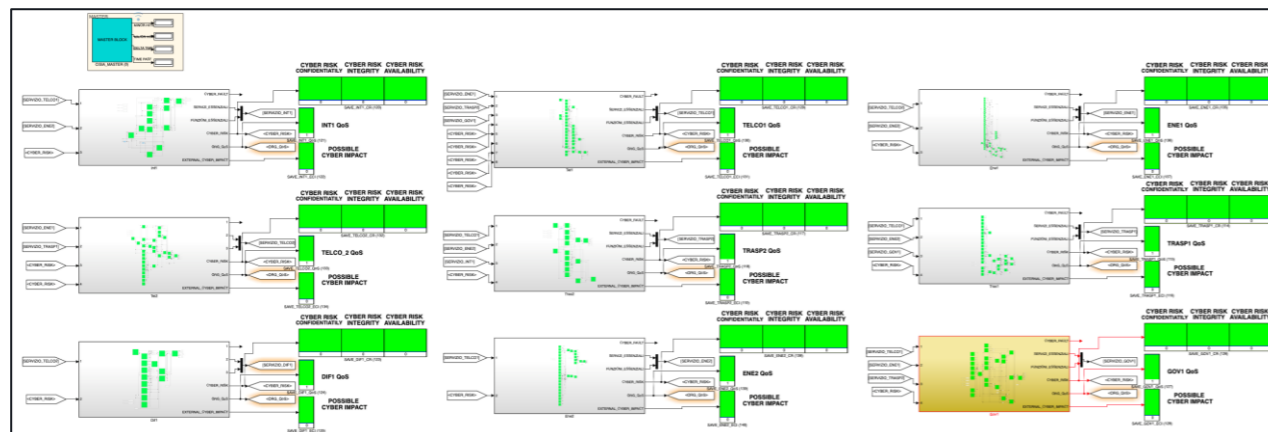
Tactical Model
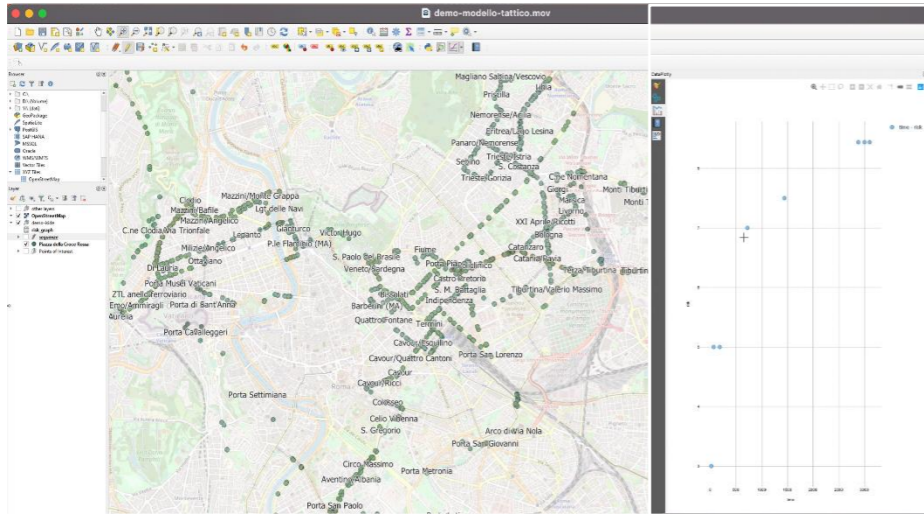
▶ Geolocalized model (high granularity) based on Points of Interest from OpenStreetMap, georeferenced information elements, etc.

▶ Dependencies derived from the strategic model

▶ It estimates the social impact (number of citizens involved) and the economic impact (loss of turnover) of each Point of Interest

Synthetic Data Generation
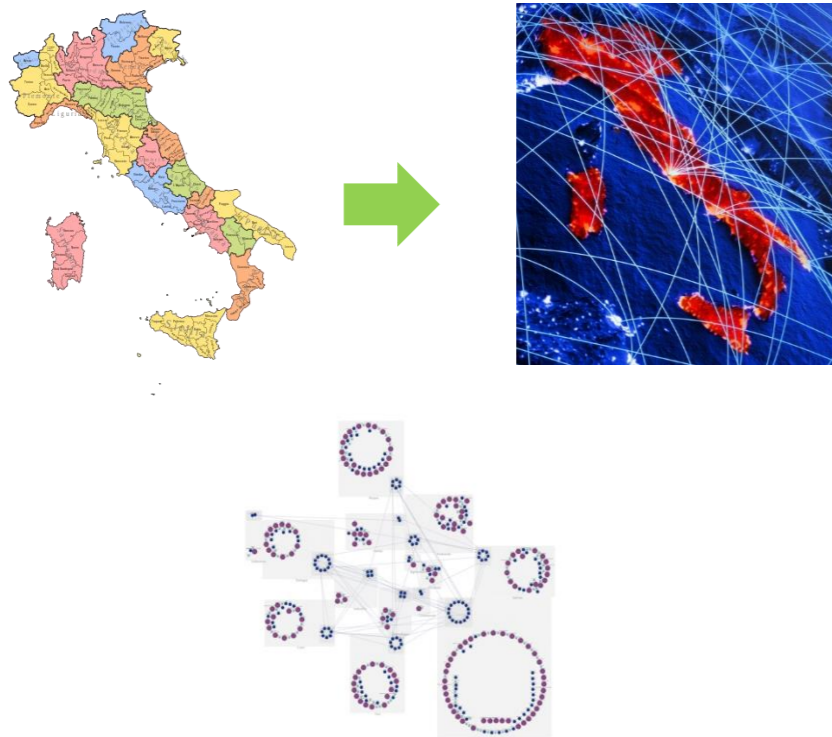
1. Rule-based generation of instances

2. These instances are used by each model to simulate and test their results

3. Comparison and refining of generated instances to manage **accuracy** and **confidentiality** using a **dedicated system**
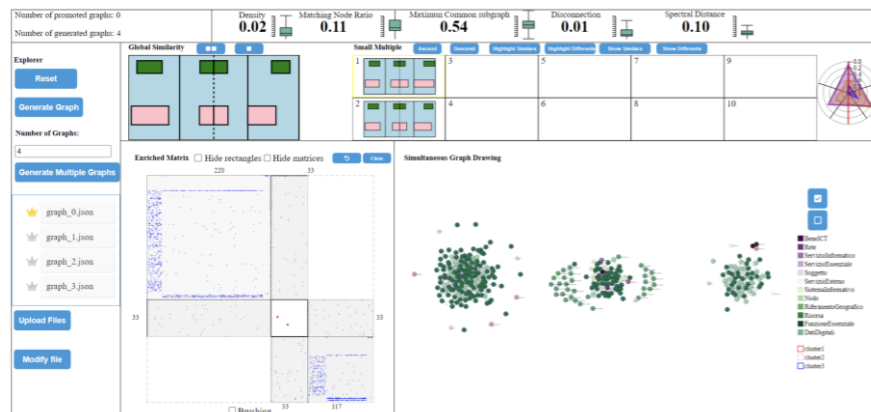
Annex
Item list

Item List

Irrigation water
Industrial water
Drinkable water
Agricolture and products
Farming and products
Forests
Lumber
Fishing and products
Waste water
Dams
Non-hazardous waste
Hazardous waste
Meteorological and climate services
Long-life food
Fresh and perishable food
Frozen food
Beverages (bottled water included)
Retail trade
Wholesale trade
Arts, sports, leisure and social activities, cultural traditions
Associationism
Education
Religion, religious organizations
Research
Coal
Fuels (oil, diesel, biodiesel,…)
Electric power distribution
Renewable Resources: Biomass
Renewable Resources: Wind
Renewable Resources: Geothermal
Renewable Resources: Hydropower
Renewable Resources: Solar
Liquefied Natural Gas
Crude oil
Methane
Nuclear power
Electric transport
Electricity generation
Insurance, reinsurance and pension funds
Cash
Stock market
Loans and mortages
Banks
Payment services and systems (cash excluded)

Clothing, accessories, footwear and supply chain
Other (industry)
Paper and supply chain
Chemicals and supply chain
Construction and supply chain
Electrical devices, domestic devices and supply chain
Electronics and supply chain
Rubber and plastic and supply chain
Metallic machinery and equipment and supply chain
Metallurgy and supply chain
Mining and non-metallic minerals production
Metal mining and supply chain
Furniture, furnishings and supply chain
Leather and furs and supply chain
Ceramic and clay products, china and non-metallic minerals and supply chain
Wooden, straw and similar products and supply chain
Metallic products and supply chain
Textile and supply chain
Glass and supply chain
Central public administrations
Local public administrations
Civil defence and Fire department
Law enforcement
Local political institutions
National political institutions
Civil protection
Governmental financial services
Penitentiary system
Defence
Physical Manpower
Virtual Manpower
Social care
Production of Medicines and of medical devices
Health emergency services
Public healthcare
Private healthcare
Veterinary services
Sale of Medicines and of medical devices
Other (graphic designers, opticians, photographers, etc.)
Real estate
Counseling (legal, accountants, etc.)
Computer science and supply chain
Temporary work
Advertising and marketing
Restaurants and catering
Accomodation and hospitality services
Maintenance services
Cleaning services (cleaning companies and laundries etc.)
Private security services
Software and supply chain

Digital Terrestrial Television (DTT)
Data processing, hosting and related activities
Provision of Internet access services (ISP)
Web portals
Television production
Publishing (books, periodicals and newspaper)
Radio broadcasting
Radio and communication services
Postal services
Satellite services
Fixed-line Telecommunications
Optical Fiber Telecommunications
Mobile Telecommunications
Air freight shipping and logistics
Air passenger transport
Ocean and sea freight shipping and logistics
Road freight shipping and logistics
Inland waterways freight shipping and logistics
Rail freight and logistics
Passenger rail transport
Public and private passenger transport by seas and oceans
Public and private passenger road transport
Public and private passenger transport by inland waterways

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