

## 1. UML Class Diagram:

Assets:

assetID

yoyTrend

aggregatedEmission

plume

Emissions:

emissionID

riskType

location

amount

Clients:

clientID

name

identity

contactInfo

Maps:

mapsID

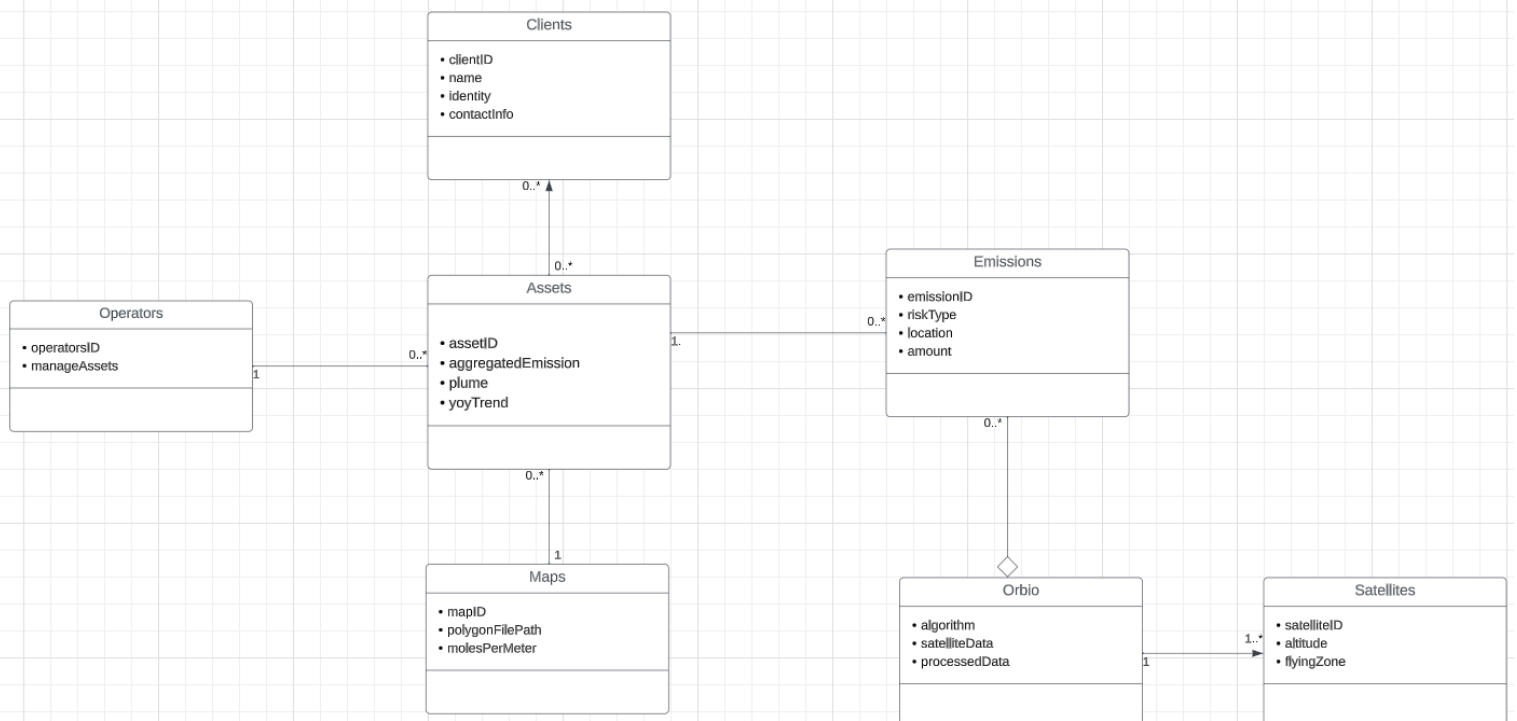
polygonFilePath

molesPerMeter

Operators:  
operatorsID  
manageAssets

Orbio:  
algorithm  
satelliteData  
processedData

Satellites:  
satelliteID  
altitude  
flyingZone



## 2. Summary problem description :

Methane is a powerful greenhouse gas, and when released without restraint, it plays a major role in accelerating climate change. It's essential to oversee and manage these emissions. A satellite-driven system offers the answer, as it can identify and measure methane emissions, delivering instantaneous information to interested parties.

## 3. Highlighting of launch post

nouns and verbs

Orbio makes it easy for sustainability and risk professionals to identify large methane emission risks across global energy portfolios. If you're interested in finding out more check out our website here, and feel free to book a product demo here!

For more information read on below 📖

Hi everyone, thanks for stopping by our launch YC post. We are Rob and Jack and we are on a mission to power the low-carbon transition through methane monitoring.

🧠 Why methane I hear you ask?

Methane emissions from the energy **industry**, if **prevented** would have the climate **impact** equivalent to taking all cars and trucks off the road globally. It is a **short-lived pollutant**, therefore **stopping** this gas getting to the **atmosphere** is one of the best levers we have in the **climate** change mitigation fight.

🚫 The Problem: Poor data on understanding where emissions occur

Existing data **collection** processes are manual, **involving** hand-held cameras on a site, expensive and not frequently available on all 12 million oil & gas assets globally. Poor data collection **processes** mean poor **data**.

Existing methane inventories under-represent methane emissions by around 70%. This is **preventing** sustainability and risk analysts from **managing** emissions in their global energy **portfolios**. **Mismanagement** of these emissions can **lead** to stock **devaluations**, stranded **assets** and **increases** global warming.

★ The solution: Global and frequent methane emissions data

Orbio **helps sustainability** and risk analysts identify where in their large energy portfolios the biggest methane emission risks are. **Identifying** previously unknown risks and doing this on a frequent basis **gives** these analysts the tools to effectively **manage** emission risks.

🤖 How it works: Processing non-methane emission satellite data

Orbio **leverages** the power of **satellite data**. We have **developed** an **algorithm** capable of **processing** data from satellites not previously designed to **monitor** methane emissions. **Using** these satellites **enables** us to **deliver** world-leading **data** across global scales, at an **asset** level (e.g. an oil well) and on a frequent **basis**.

Benchmarking **assets**, **operators** and **countries** on methane emission **performance**:

Mapping out where these methane emission risks lie in energy portfolios

💰 The opportunity: A growing market being pulled by new regulation

A sweep of regulation being **introduced** across the globe in 2023. This is **putting pressure** on the energy industry, financial professionals and **insurers**, totalling around 60,000 **companies** worldwide, to **get** a better understanding of what the associated emission risks in their **energy portfolios**.

## 4. Summarize nouns and verbs

### Nouns

Methane Emission Earth Data Authorities System Stakeholders Methane Emission pressure insurers algorithm assets operators countries sustainability collection portfolios sustainability transition

### Verbs

easy identify finding prevented stopping involving processes managing lead increases helps Identifying gives manage leverages developed monitor deliver introduced

## 5. Narratives - Rules

- An asset can produce multiple emissions over time.

- Each emission is linked to a specific asset from which it originated.
- A client can be associated with multiple assets, indicating their interest or ownership, and assets can have multiple clients, helpful to be better managed.
- Each asset can have geographical data represented in one map.
- Operators are responsible for managing none or more assets.
- Assets can only be managed by one operator.
- Assets have a year-over-year trend, indicating the change in their emissions or performance over consecutive years.
- Emissions have a risk type, categorizing the potential harm or impact of the emission.
- Maps provide a polygon file path, which might represent the geographical boundary or area of the asset that are saved in the server.
- Operators might have specific roles or permissions, determining which assets they can manage.
- Orbio relies on the satelliteData from Satellites to produce processedData using its algorithm, there's a dependency from Orbio to Satellites.
- there's a directional dependency from Emissions to Orbio
- Orbio and emissions can exist independently
- Orbio class processes satellite data to identify methane emissions

## **6. Has challenge questions**

**Data Redundancy:** With multiple clients being associated with multiple assets and vice versa, there might be redundancy and complexity in managing such many-to-many relationships.

**Confusion:**

Not sure how pictures will be saved in the database, either a file path or binary data file in database, also not sure about how exactly will operator manage the assets, there is a security issue between operator and assets.

## **7. Includes one creative addition**

the Orbio class is central to processing satellite data to identify emissions, which are then represented as instances of the Emissions class. The relationships highlight the dependency of the Emissions data on the processing done by Orbio. Without my creative addition, Emission could have the algorithm and process all the data. But with this change, we can compare the raw data and processed data, which could be valuable to the company.