

# Using building data and machine learning to find retrofitting customers



**geoimpact**

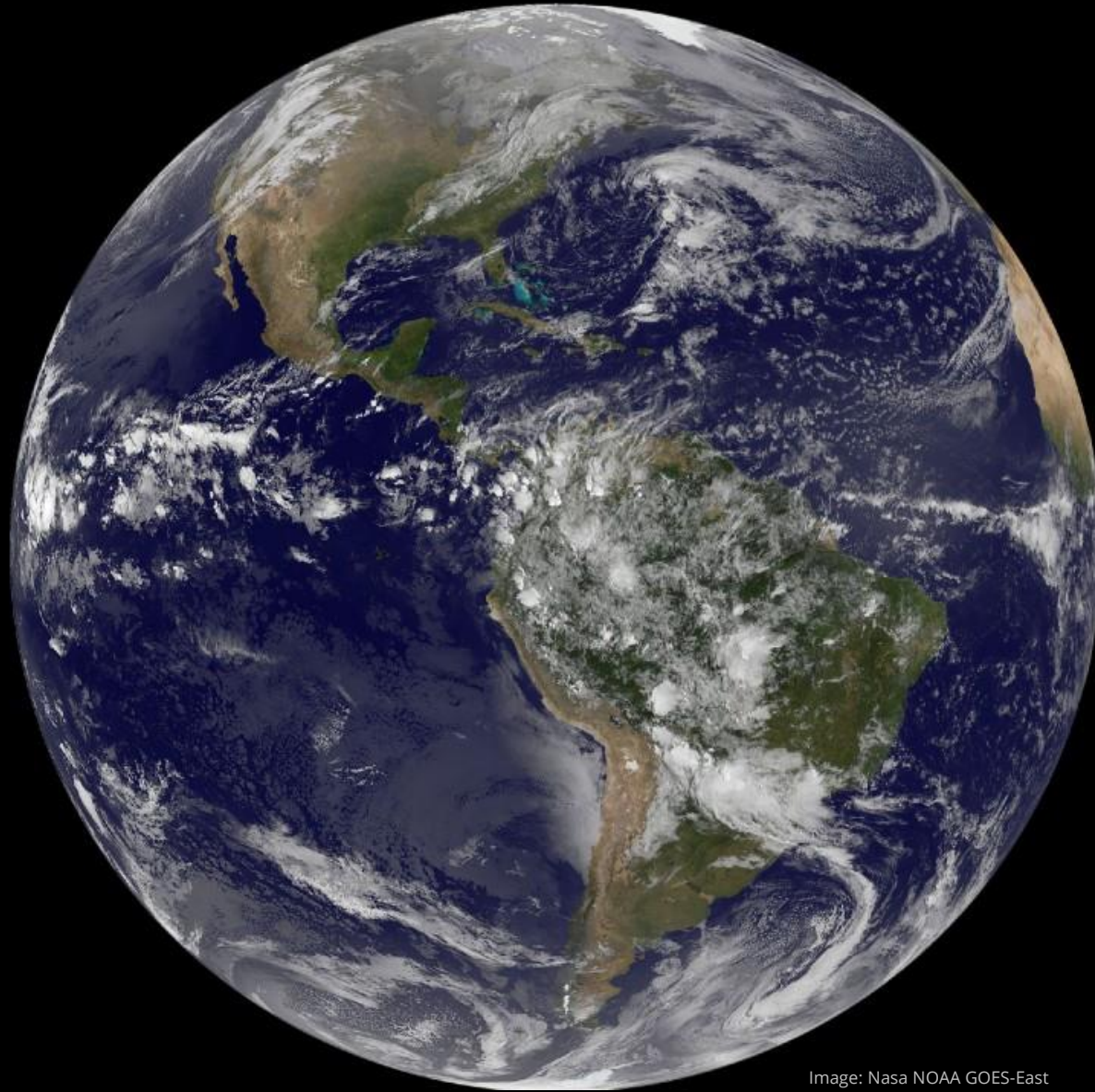
your place. your choice.

HSLU

Thilo Weber  
Data Scientist

**Energy Transition**

**Big Data**



**Machine Learning**

**Digitalization**

**Platform**

Image: Nasa NOAA GOES-East

**We make decentralization  
easier and more accessible!**

# geoimpact AG

2017

## Foundation



Knowing where the energy transition takes place.

2018

## Swiss Energy Planning goes live



Swiss Energy Planning  
The first integrated online platform for energy planning in Switzerland.

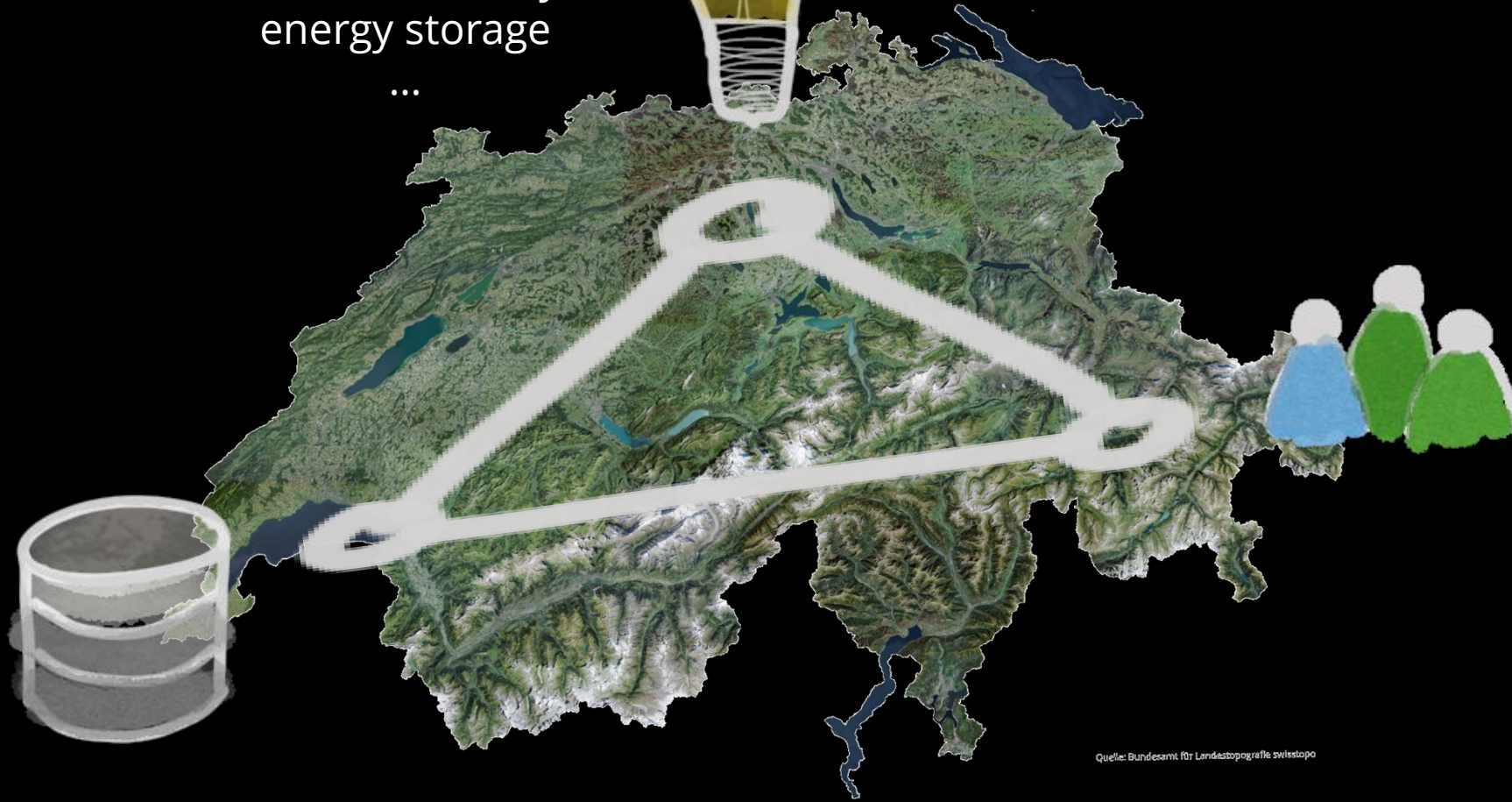
2022

## 11 People



Gutenbergstrasse 14, **Bern**  
Heinrichstrasse 267, **Zürich**  
Barfüsserplatz 3, **Basel**

**Solutions**  
solar systems  
heating systems  
electric mobility  
energy storage  
...



**Data**  
swisstopo  
SFOE (BFE)  
FSO (BFS)  
Zefix  
...

**Stakeholders**  
communes  
utilities  
product suppliers  
energy consultants  
building owners  
...

# SEP Facts

**500 Mio**  
data points

**> 20**  
data sources

**650**  
features per  
building

**450**  
API endpoints

**1'000**  
daily events

**200**  
active users

**6**  
machine learning  
models

**8**  
DB systems



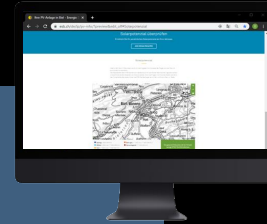
# 1. Energy Portal for Communes



Targeted information and raising awareness with minimal effort.



**Citizens Biel/Bienne**  
Recommendation for heating replacement & PV at one click.



**Energy Consultancy Seeland**

Efficient consulting without costly data collection.

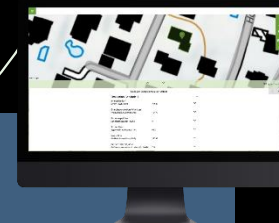


Find customers for densification and expansion for district heating.



**Installers/  
Product Suppliers**

Already know future customers and their locations.

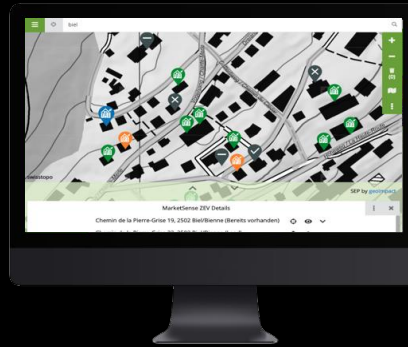


# 2. Data-based Planning & Marketing for Product Suppliers

## Outbound Process with SEP



define sales requirements  
(MarketSense filter)

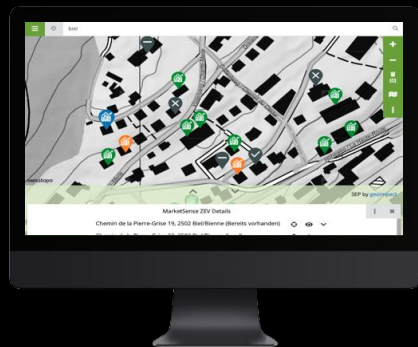


potentials overview

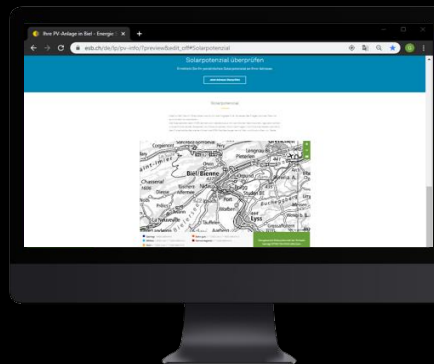
Ihr Produkt für die Schweiz | Ihr Unternehmen  
[Ad www.ihr-unternehmen-auf-sep.ch](http://www.ihr-unternehmen-auf-sep.ch)  
Sie möchten ein tolles Produkt für Ihr Gebäude? Dann sind Sie hier am richtigen Ort. Prüfen Sie Ihren Standort auf die Eignung für unser Produkt.

drive campaigns

## Inbound Process with SEP



consulting process

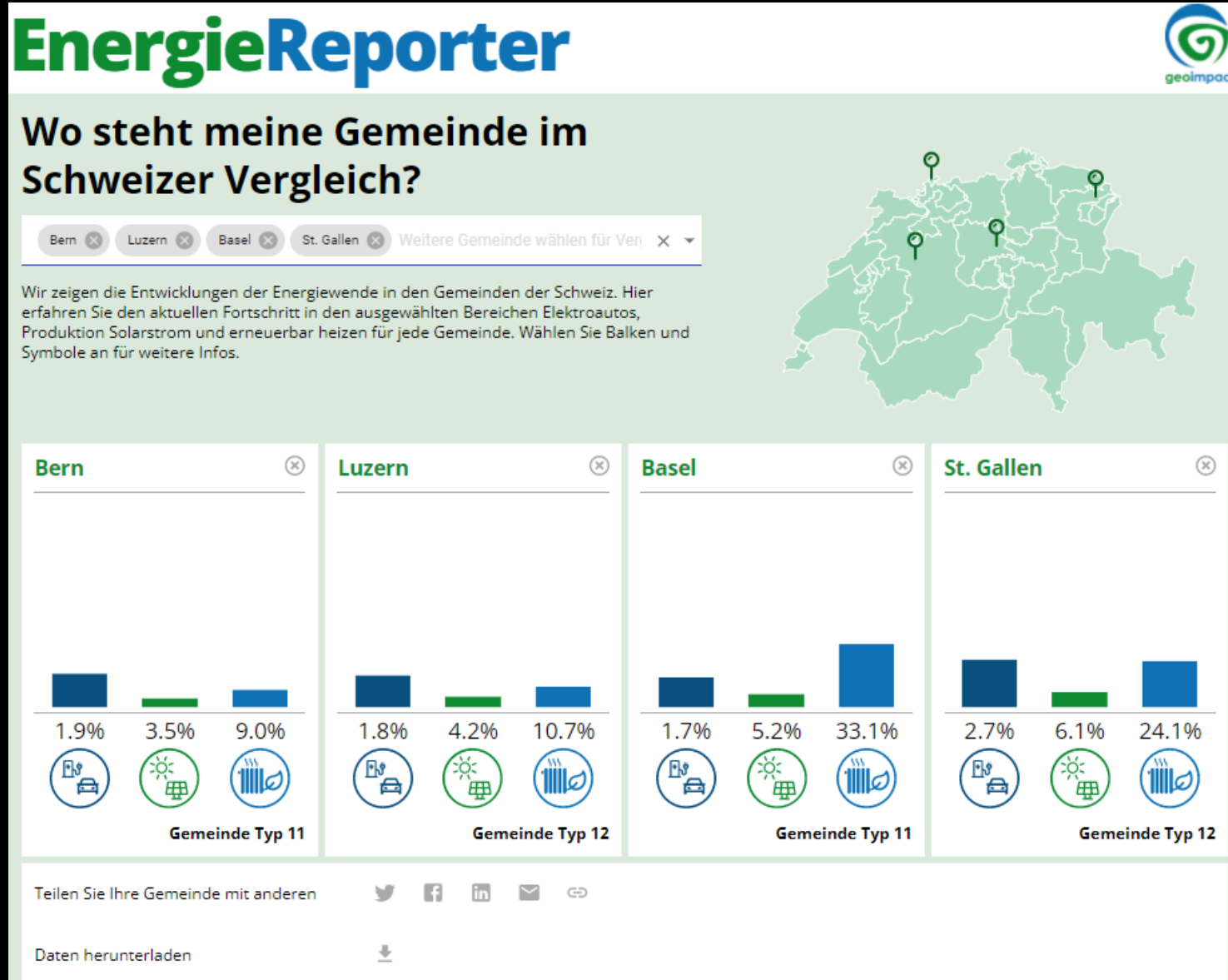


landing page

Ihr Produkt für die Schweiz | Ihr Unternehmen  
[Ad www.ihr-unternehmen-auf-sep.ch](http://www.ihr-unternehmen-auf-sep.ch)  
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GoogleAds campaign

# 3. Indicators for the Public



## Open Data

<https://www.energiereporter.ch>

<https://opendata.swiss/de/dataset/energie-reporter>



# 4. Analytics and Machine Learning

	Information gain	Efficiency gain
Metrics / indicators	<ul style="list-style-type: none"><li>• Energie Reporter</li></ul>	<ul style="list-style-type: none"><li>• Campaign statistics</li></ul>
Heuristic models (designed by experts)	<ul style="list-style-type: none"><li>• Building volume</li></ul>	<ul style="list-style-type: none"><li>• Heating replacement recommendation</li><li>• MarketSense filter</li></ul>
Machine learning models (learning from training data)	<ul style="list-style-type: none"><li>• Renovation pressure</li><li>• Heating type</li><li>• Heat demand model</li></ul>	<ul style="list-style-type: none"><li>• ML-leads generator</li><li>• Lead scoring</li></ul>

*"First, design and implement metrics."* (#2/43 of Google's rules of ML)

*"Don't be afraid to launch a product without machine learning."* (#1/43 of Google's rules of ML)

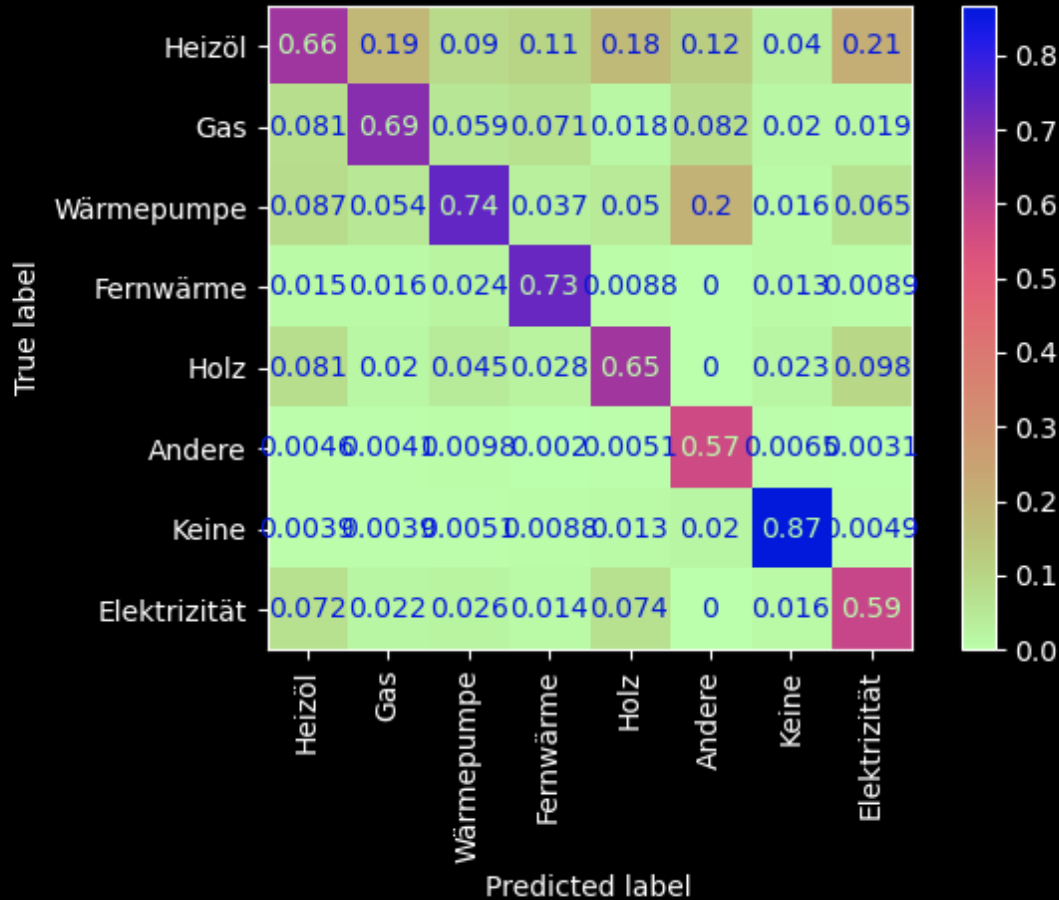
*"Choose machine learning over a complex heuristic."* (#3/43 of Google's rules of ML)

<https://developers.google.com/machine-learning/guides/rules-of-ml>

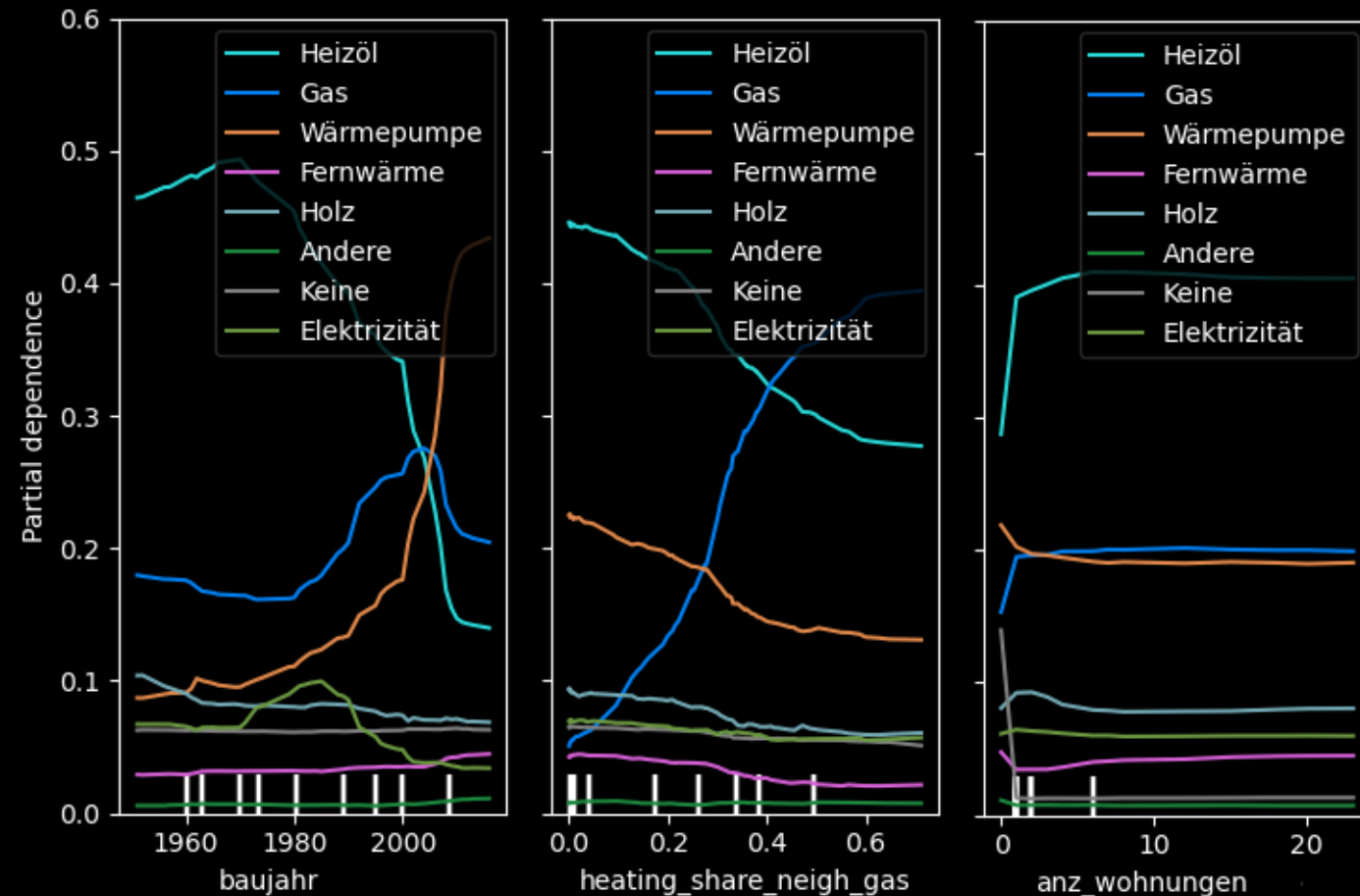
# 4. Models – Heating Type Prediction

- Predict heating system of each building based on public features only

Confusion Matrix



Partial dependency plots



# Thank you!

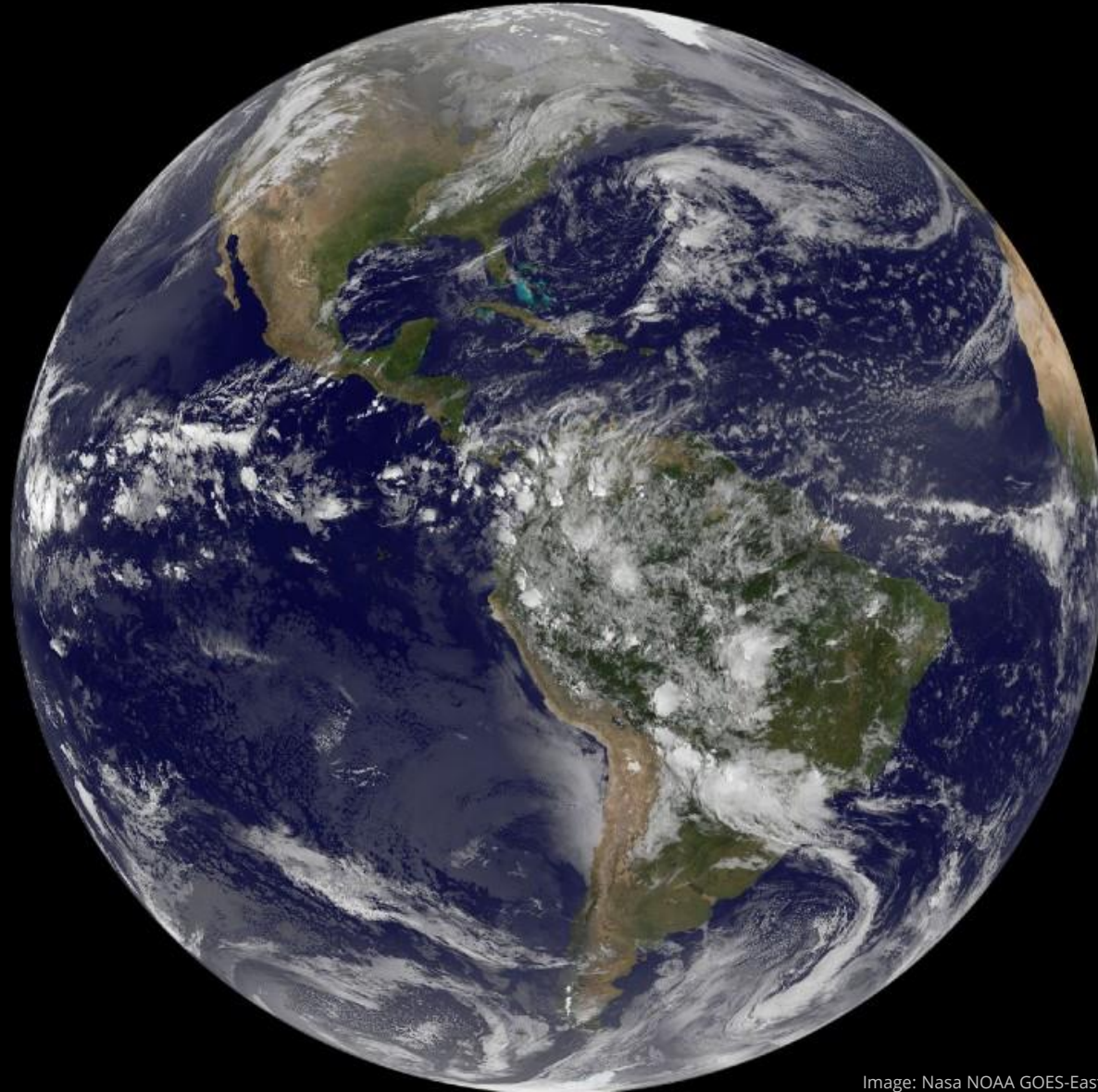


Image: Nasa NOAA GOES-East

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