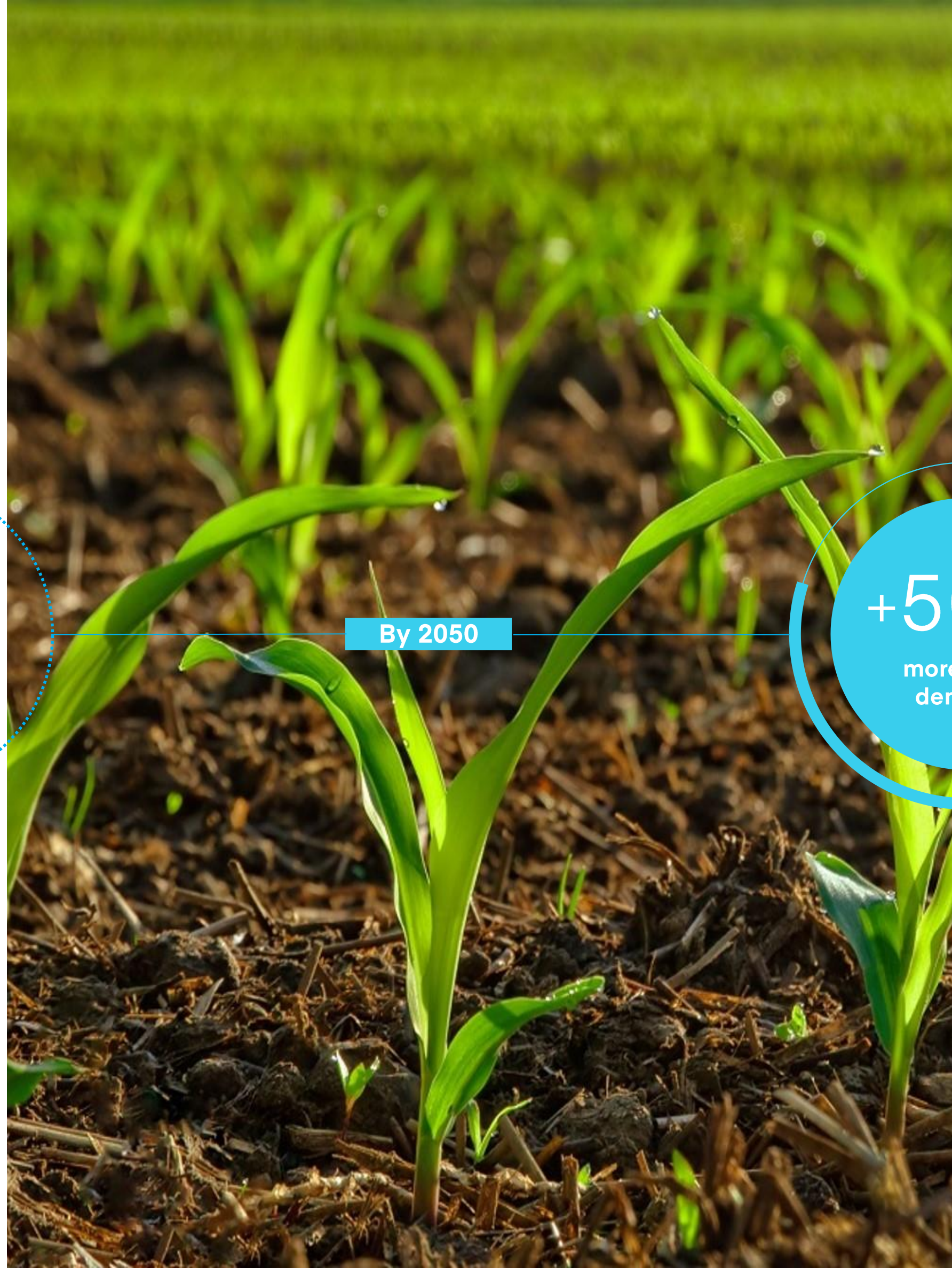


Bridging the Global Food Gap

Precise, Global Temperature Data for a Growing Planet

Max Gulde: max@constellr.space | Christian Mittermaier | Marius Bierdel



By 2050

+50%
more food
demand

Future of Agriculture

Food **needs** Water **needs** Temperature **Data**



Limited cropland



Climate Change



Increasing water scarcity



Irrigation more than
doubles food
production



Water cycle
determined by
evapotranspiration



Evapotranspiration
critically depends on
temperature

Irrigation

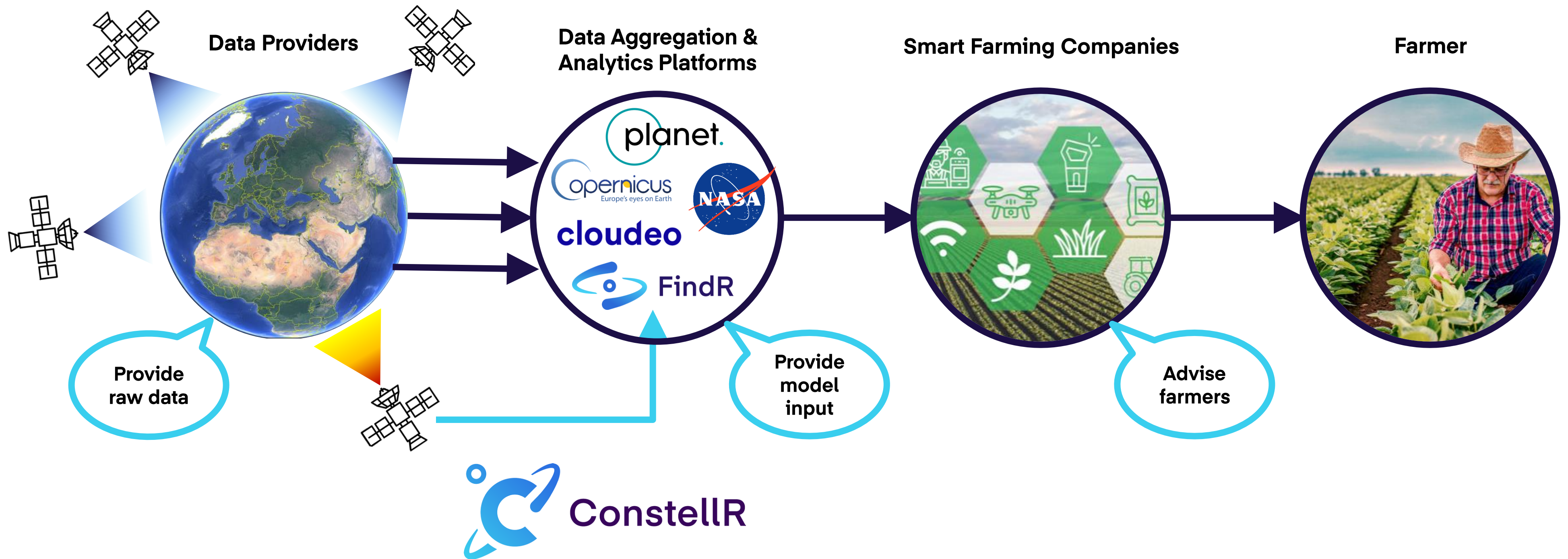




Company

ConstellR provides **daily, global land surface temperature maps** used as the key foundation data for Smart Farming.

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Why Temperature?

An **Innovative Approach** to Crop Stress Detection



Indicator

Physiology



Temperature

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Healthy vegetation
reflectance
Green = Good

50% NIR 8% RED



NDVI = 0.72

Stressed vegetation
reflectance
Brown = Bad

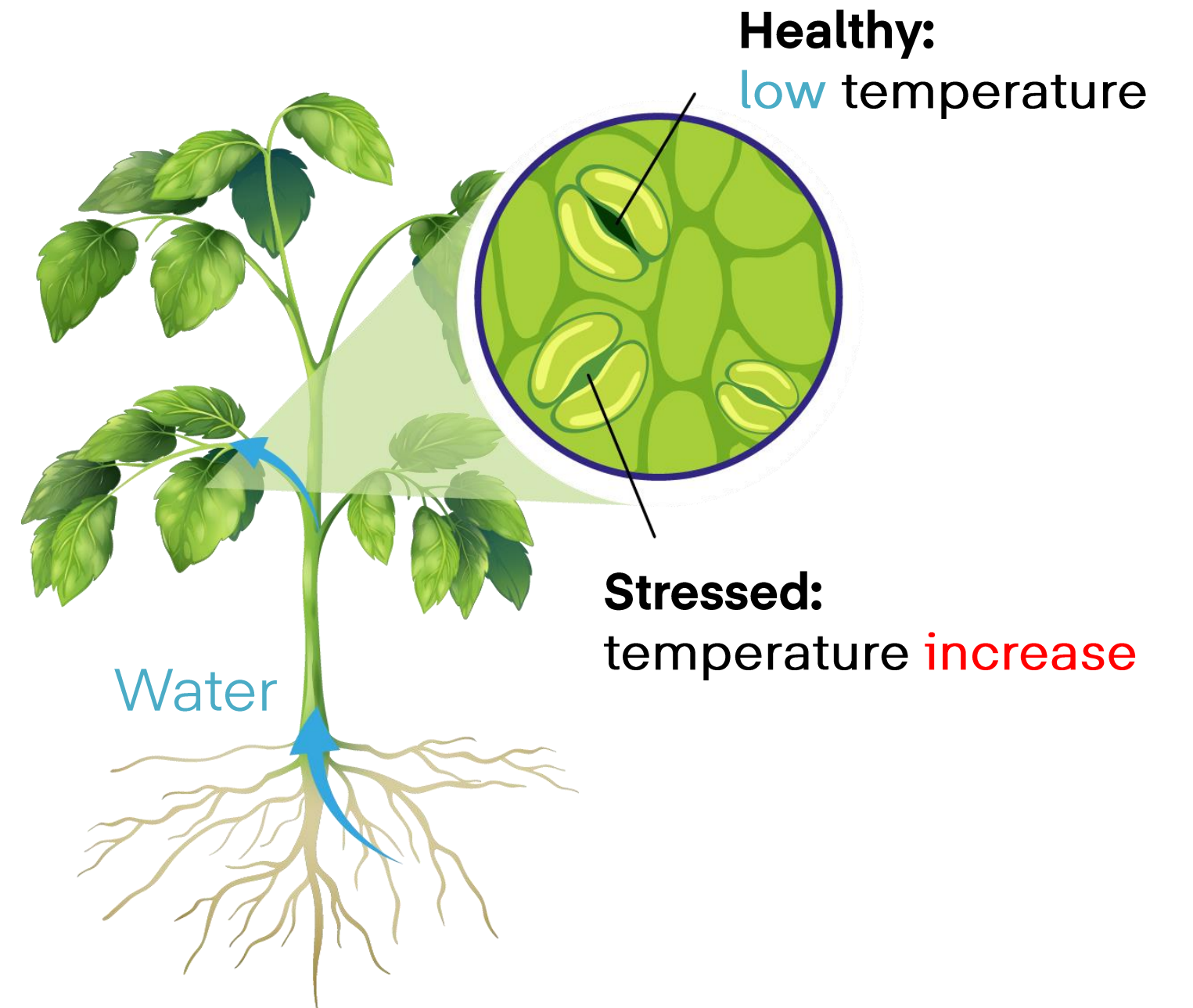
40% NIR 30% RED



NDVI = 0.14

Source: Agricolus


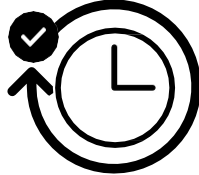

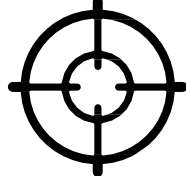

Approach





Customer Requirements

The market needs daily, field-level temperature data.

		Requirement
	Resolution	50 m to be at the level of a single field
	Frequency	Every 24 to 48 h to timely observe and act on changes
	Coverage	Planetary to monitor 1.5 Bn hectares of global crop land
	Reliability	Better 1.5°C to derive precise crop water need
	Affordability	To support developing growth regions for food production

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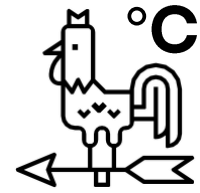
Based on interviews and surveys including





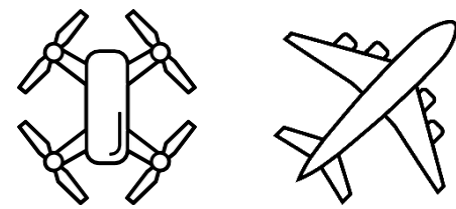
Customer Problem

Currently available data does not meet market requirements



Weather Stations

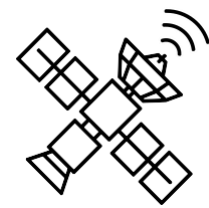
- Expensive
- Installation and maintenance
- Large up-front investment



Aerial Remote Sensing

- Expensive
- High effort
- Require technical infrastructure

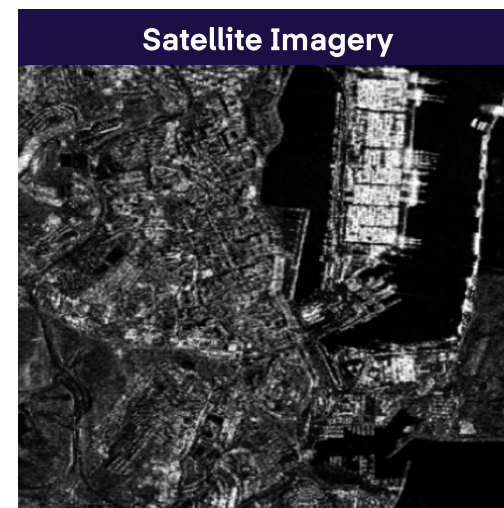
Do not scale



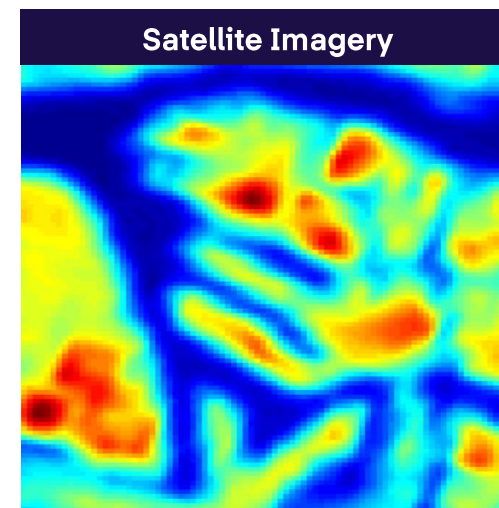
Current Satellites



Visual



SAR



Thermal

Lack of informative value!

Lack of coverage!

Not fit for purpose



Mechteld Andriessen
Account Manager Projects

"[with the ConstellR] solution.... we could greatly improve the quality of our products, reach more clients and increase the impact we want to have on a climate resilient future"

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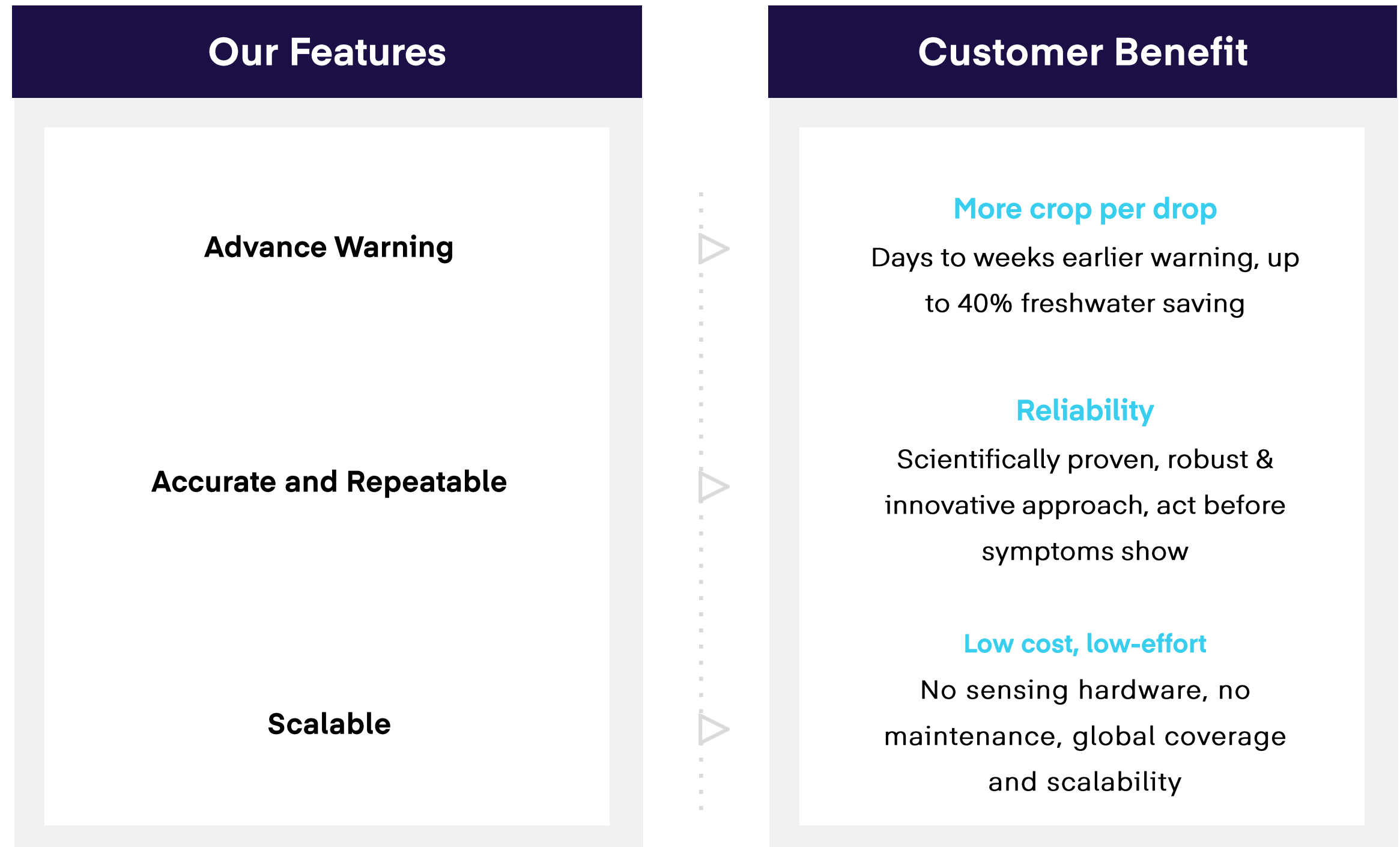


Dr. Elisabeth Becker-Löffler
Senior Project Manager Digital Farming

"We fully agree with the urgent need as well as see the increasing market demand [...] we are very much interested in the service becoming commercially available as soon as possible."

Value Proposition

Foundation Data for Agriculture 4.0





Solution & Product

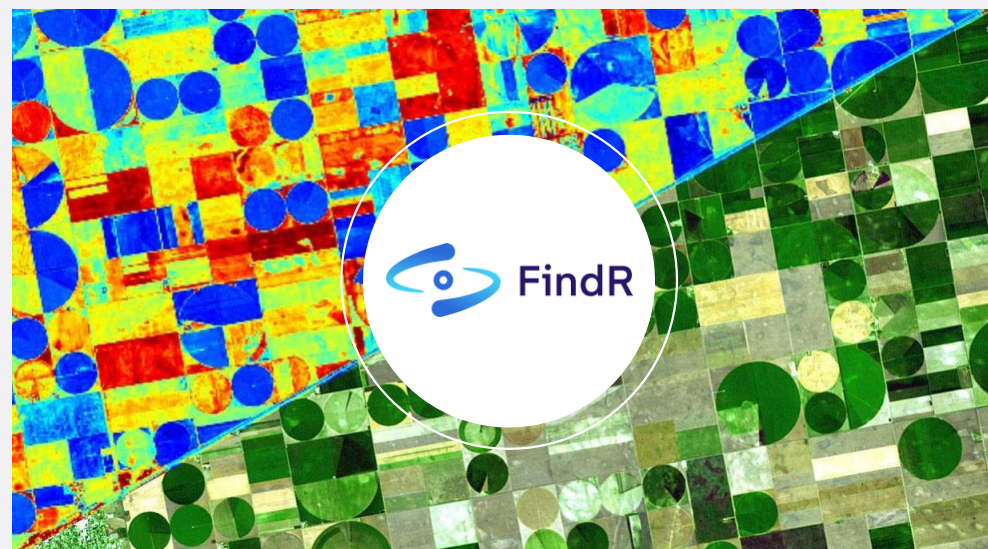
Precise, Global Temperature Data for a Growing Planet.

The Product

Daily, global, field-level temperature monitoring

Analytics-ready Level-2 Land Surface Temperature Data

Accessible service: Distribution of cloud-optimized monitoring service via online platform FindR

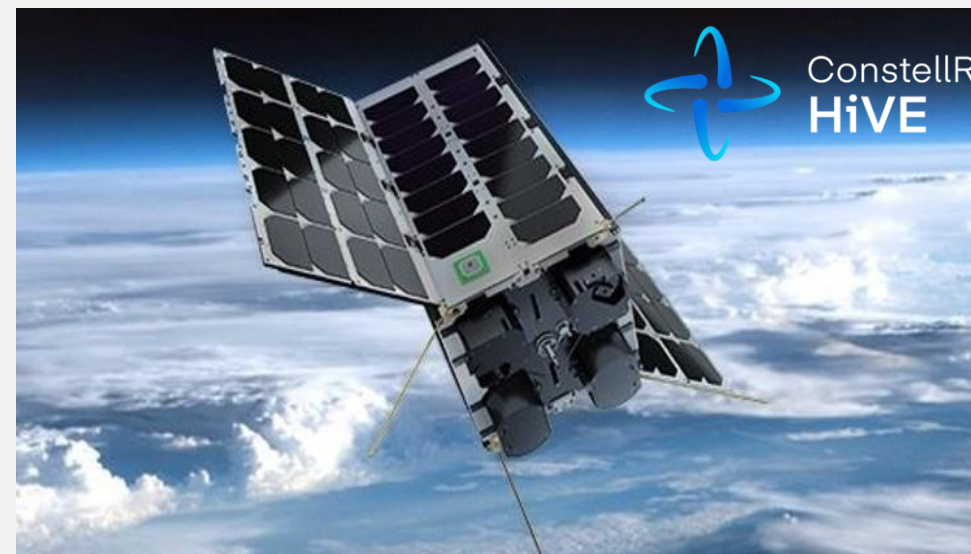


The Infrastructure

HiVE: Thermal Infrared Microsatellite Constellation

Daily revisit @ 50 m with only 4 satellites

Capacity: **More than 1 M km²**



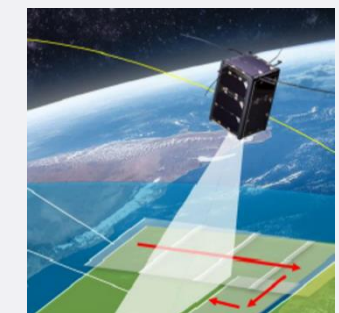
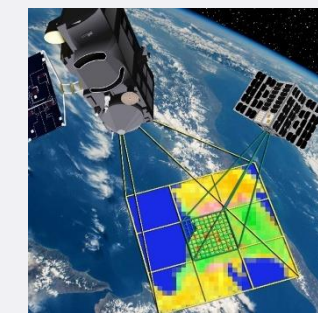
The Innovation

Mission Architecture (3 patents pending)

Approach
from physiology to temperature

High temperature accuracy
via virtual calibration

Reduced thermal loads
via 3D-printing technology





Impact

TIR constellation sustainably adds 7% to global yield in 10 years.

Assumptions

Water saving potential same as with in-field sensors

Adoption of smart irrigation today 10%

Smart irrigation adoption by 2030 +30%

Making irrigation smart

Saving 18% global freshwater (501 B t)



Enabling irrigation for unirrigated fields

+7% global crop yield (579 M people)



Economic value of additional gross production

EUR 131 B annually

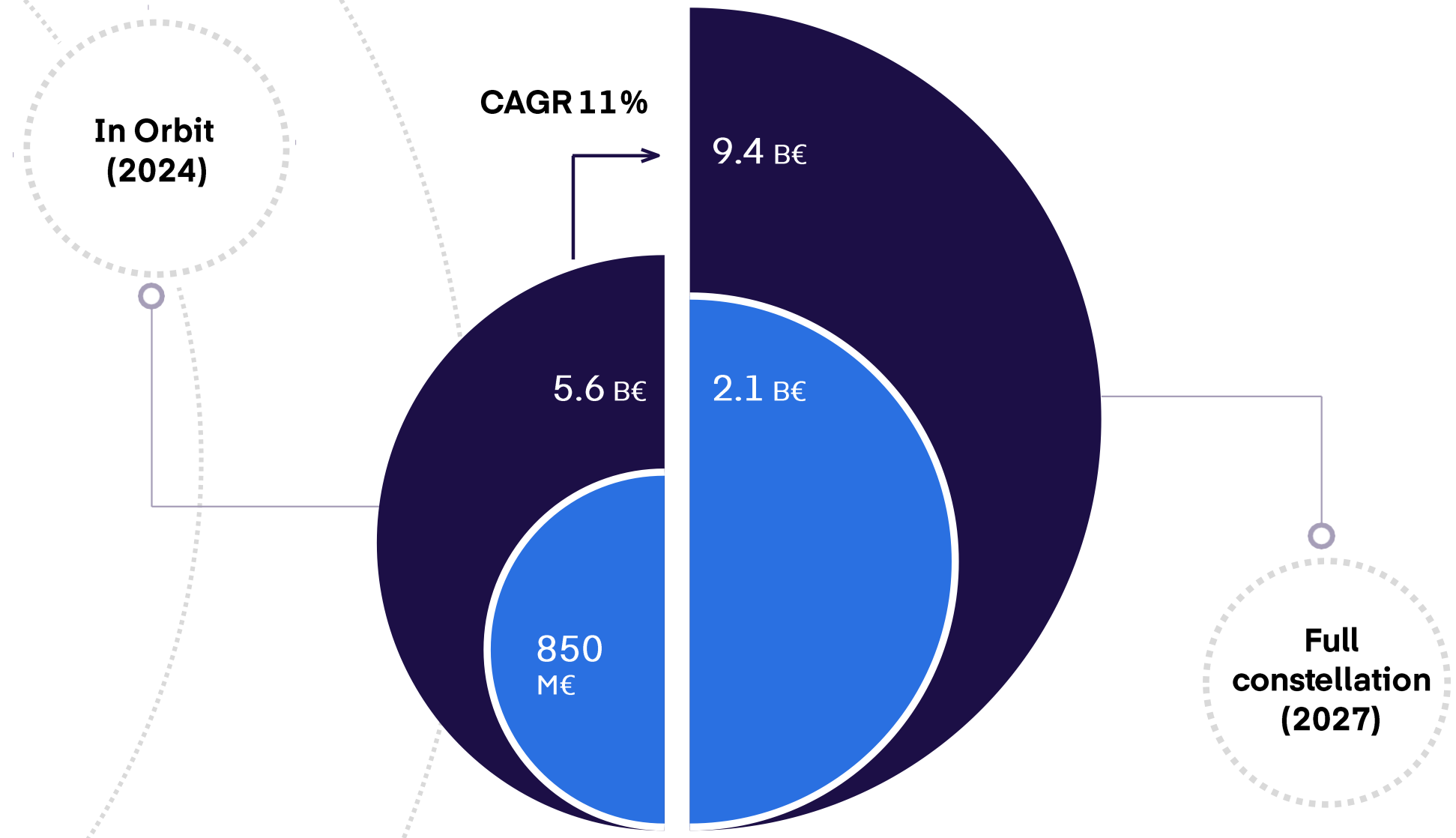


Assuming operational constellation with 28 to 77 satellites.



Market & Risks

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- **Total Addressable Market**
EO Commercial Data Market (CAGR 11%)

- **Serviceable Addressable Market**
EO AgriTech Data Market (CAGR 20%)

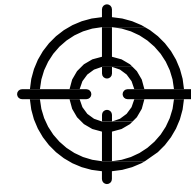
Sources:
Copernicus Market Report 2019, Transparency Market Report 2020

Commercial risks	1. Failure to secure first-mover advantage	Mitigation →	1. Off-the-shelf components, manufacturing partnerships
	2. Missed & failed launches		2. Dedicated, insured launches
	3. Failure to secure large investments		3. Scalable mission design, data distribution solved

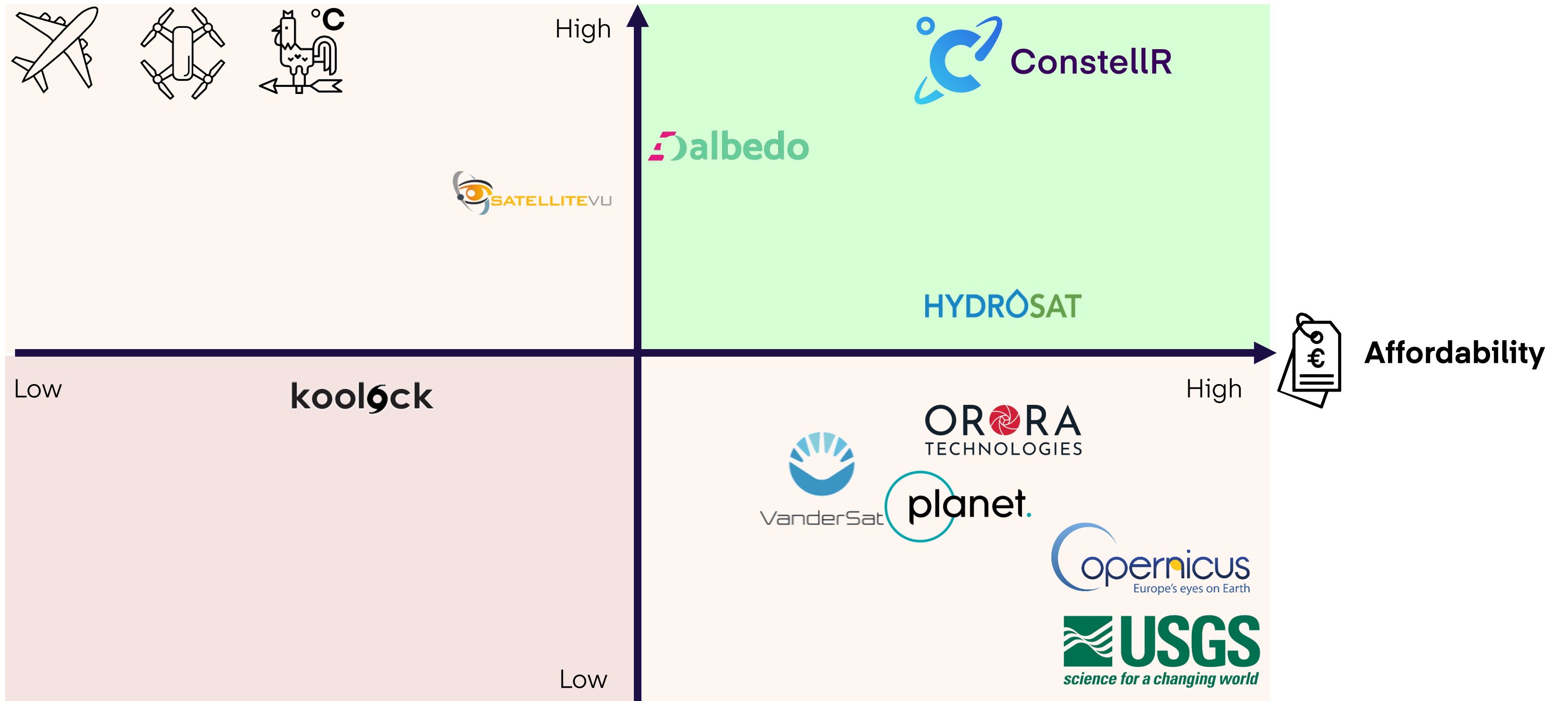


Competition

ConstellR has the only solution to provide precise and affordable global temperature monitoring.



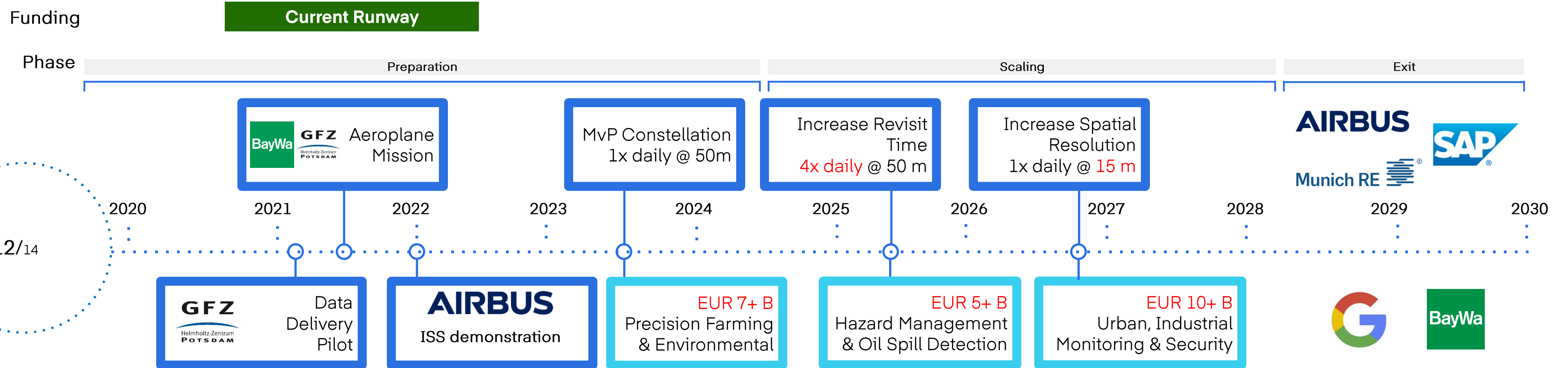
Crop stress detection capacity





Development Roadmap

ConstellR will become the global leader in temperature monitoring



20+ letter of intent received across industries





Team & Support



Dr. Max Gulde
CEO and Co-founder
Data Scientist



Marius Bierdel
CTO and Co-founder
Aerospace Engineer



Christian Mittermaier
CFO and Co-founder
Business Development



Cassi Welling
COO
Environmental Governance



Jason Maroothynaden
ESA Business Broker



Chiara Manfletti
ESA Policy &
Programmes Co-ordination



Fabrice Testa
Serial Space
Entrepreneur

Advisors

R&D



Alex



Atin



Daniel



Sai



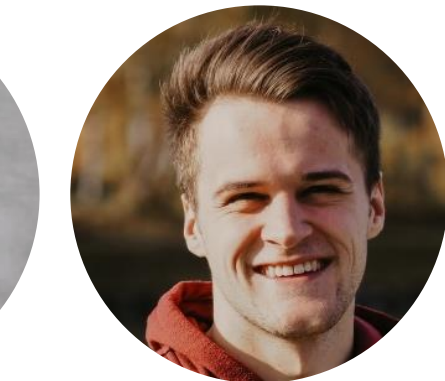
Eva



Akhshaan



Rosa



Maximilian



Rashi



Dilpreet



Priya



Nishant



Simon

Data Delivery

Commercial

Marketing



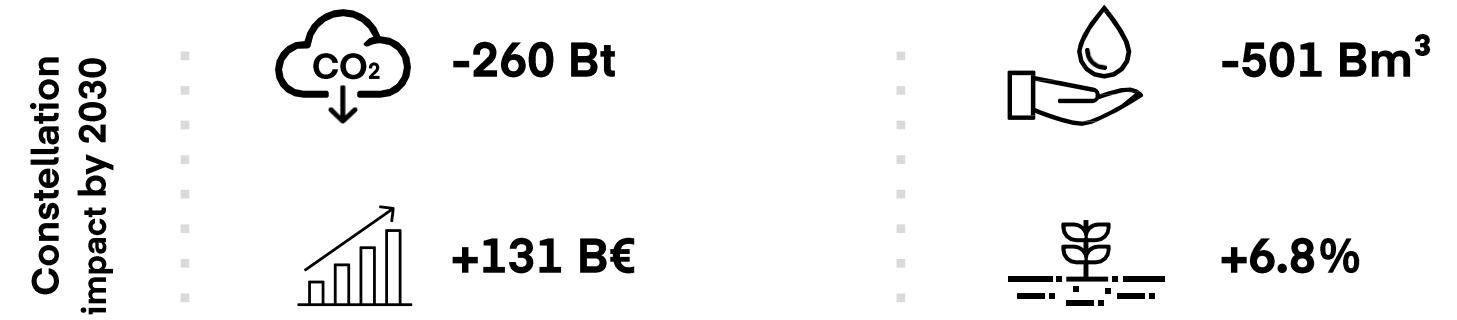
Conclusion

Establishing sustainable leadership in infrared remote sensing

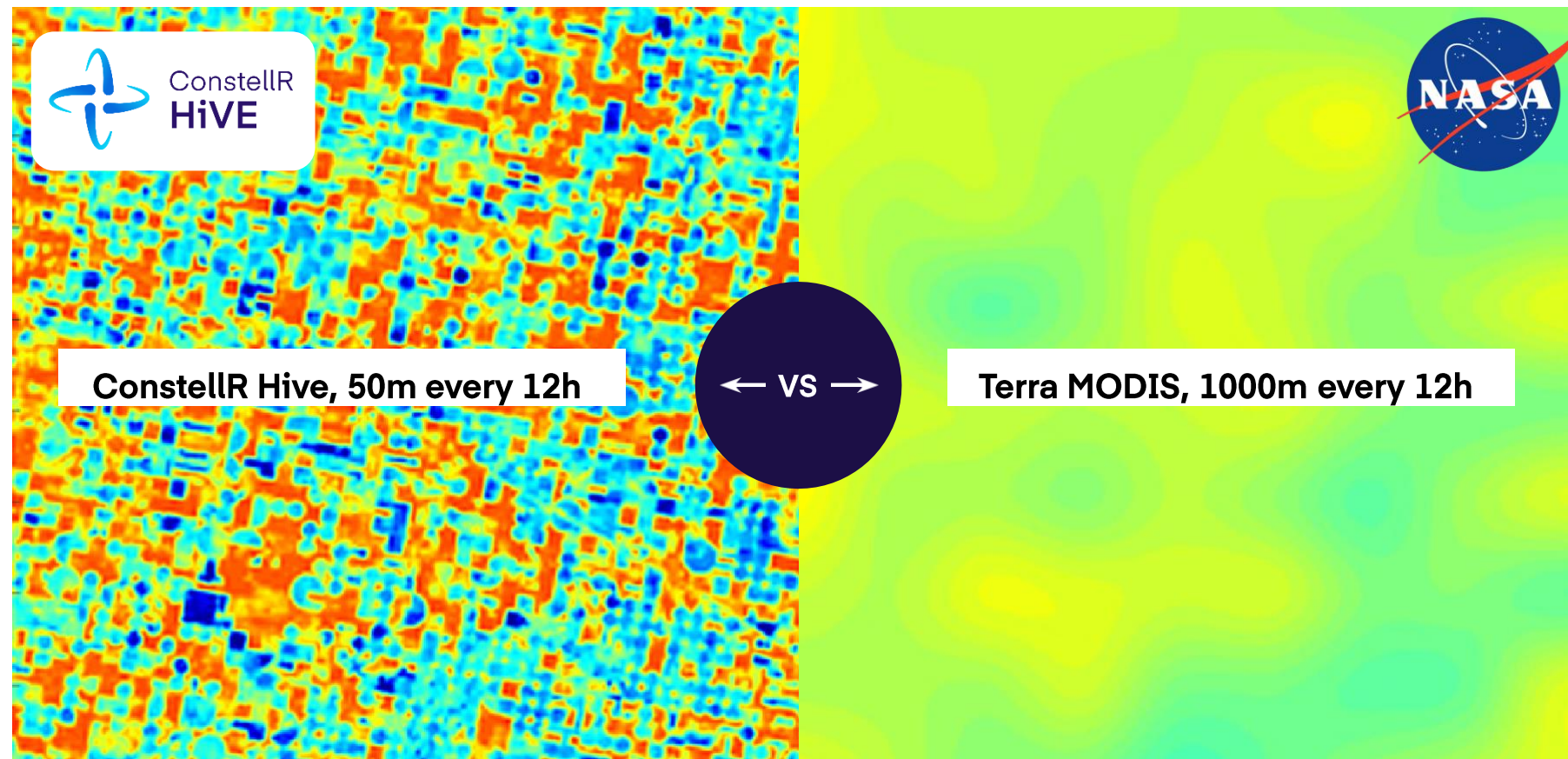
Contributing key data to **humankind's food security**

Adding **7% to global food production** by 2030 in a sustainable way

First **system in space in Q1/2022**



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Awards & Recognitions



Our Key Partners

