FET Open – experiences from a H2020 collaboration project

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FET (Future Emerging Technologies) is part of the Horizon 2020 program

"FET Open, now part of the European Innovation Council (EIC) Pathfinder pilot, supports the early-stages of the science and technology research and innovation around new ideas towards radically new future technologies."

Image from: https://ec.europa.eu/programmes/horizon2020/en/h2020-section/fet-open

FET Open calls for collaborative research and innovation actions. Three "gatekeepers":

* Radical vision

* Breakthrough technological target

* Ambitious interdisciplinary research

https://www.fet-bam.eu/

https://cordis.europa.eu/project/id/964545

BIO-ACCELERATED MINERAL WEATHERING – how does our project relate to the "gatekeeper" requirements?

* Radical vision:

Combining machine learning and multivariable experiments to capture CO_2

* Breakthrough technological target:

Producing a product to be used by industry (new technology, software and methods)

* Ambitious interdisciplinary research:

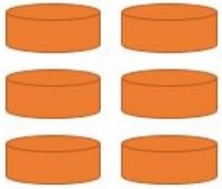
Microbiologists, software engineers, geochemists, chemists, programmers, biologists from 4 different countries

FET - Open

Project prerequisites: randomness and openness – *true basic research that allows for true new discoveries*

Weathering dynamics
Microbiota
Macrobiota

250 batch reactors



Active learning

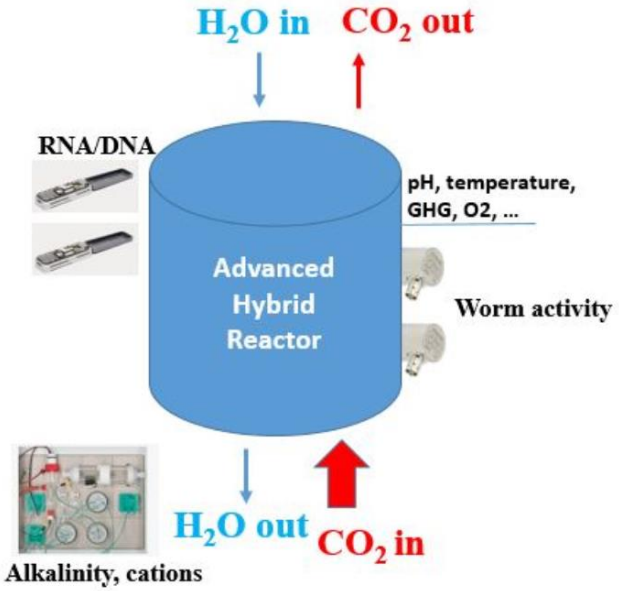
Experiment design iteration loop

Designing reactor experiment

Machine learning

Reinforcement learning

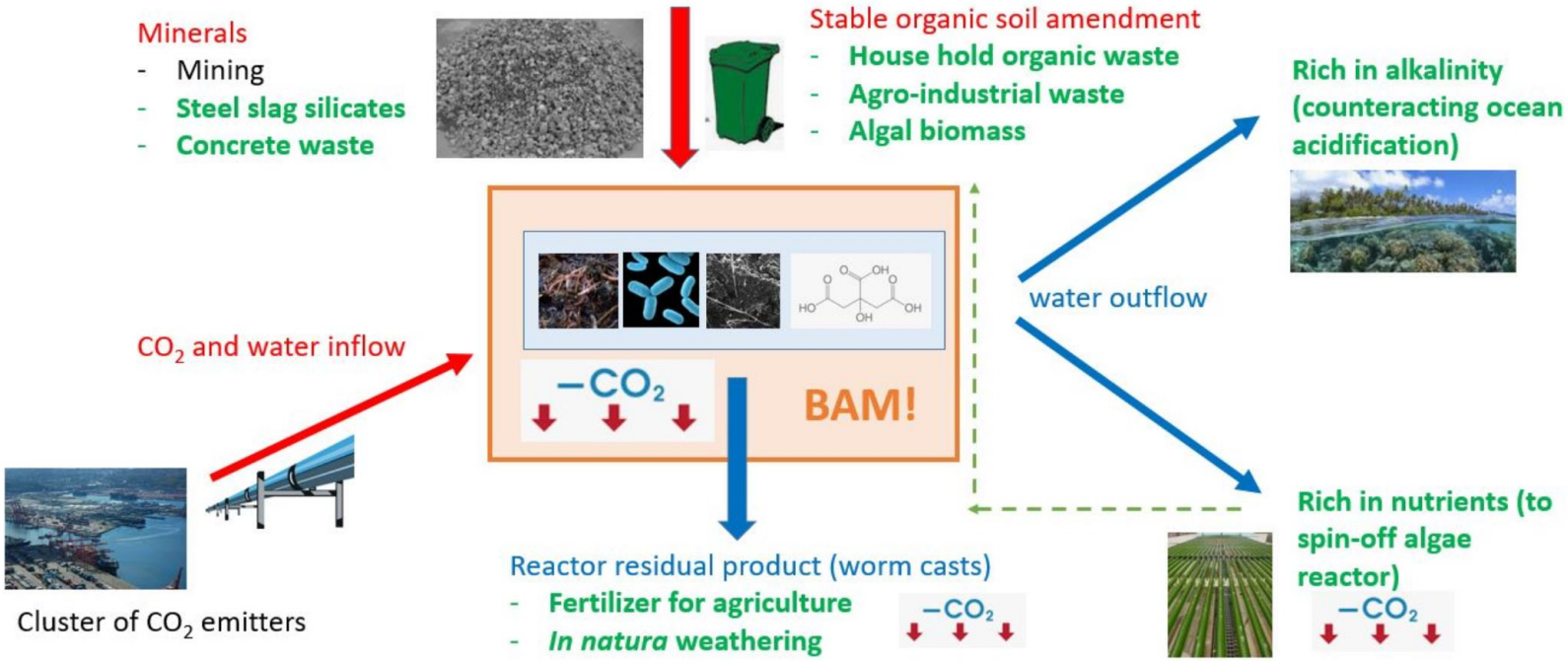
Capturing dynamics through time series modelling



Testing 1000's of biota combinations

AI analysis

In-depth reactor testing of key biotic mixes


Minerals
- Mining
- Steel slag silicates
- Concrete waste
Stable organic soil amendment
- House hold organic waste
- Agro-industrial waste
- Algal biomass
Rich in alkalinity (counteracting ocean acidification)
water outflow
CO_2 and water inflow
$-CO_2$
BAM!
Cluster of CO_2 emitters
Reactor residual product (worm casts)
- Fertilizer for agriculture
- *In natura* weathering
$-CO_2$
Rich in nutrients (to spin-off algae reactor)
$-CO_2$