Development and deployment of renewable energy technologies: approach and examples from Flanders

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vito

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Our common challenge…

A reassuring truth: clean technology will be part of the solution…

Flanders

- In the heart of Europe
- Densely populated & heavily industrialized….
- Part of the 2nd largest chemical cluster in the world after Houston, TX
- Hosts an innovative ecosystem
- Ports as energy- and CCU-hubs, economic engines

Elements of Flanders' innovation model

Based on a long term vision, VISION 2050

Translation of SDG's to objectives for Flanders for 2030

- **Implementation of objectives using adequate governance models**
- **Stakeholder management, adapted monitoring and reporting,,…**

Apply quadruple helix approach: knowledge institutes, industry, governments, citizens and midfield organizations collaborate, aiming at maximal economic and societal impact of R&D&I.

- **mission oriented innovation: stimulating innovation across sectors, actors and disciplines, enabling bottom-up solutions and experimentation**
- **collaborative and transformative systems innovation -> systemic solutions**

Apply principles of transition management

- **Partnerships and co-creation, cooperation with cities and municipalities**
- **Cluster policy (SPC's), for selected sectors, 10yr reach**
- **Living labs/low regulation zones**

R&D-intensity of 3,6% of GDP, 3rd best innovation system, 3rd most innovative economy in the world, innovation leading region in Europe,…

VITO, a strategic Flemish knowledge institution

- A multidisciplinary R&D center with over 1000 experts (45 countries, including 100 PhD-positions) with focus on clean technologies and sustainable solutions, accelerating the systemic transition towards a sustainable industry and society.
- Research domains: focus on energy, land use, materials, sustainable chemistry and health
- Uses quadruple helix approach, multi-stakeholder involvement and management:
  - ✓ participates in mission-oriented innovation across sectors
  - ✓ systems approach – science based – data driven – integrated solutions – adopting enabling (digital) technologies: AI/drones/blockchain/big data/sensors/IoT/…
  - ✓ collaborative innovation in EnergyVille with IMEC, KULeuven and UHasselt
  - ✓ collaborates in the HYVE-consortium
  - ✓ collaborates with Spearhead Clusters (SPC's):
    - E.g. moonshot for the chemical sector led by spearhead cluster Catalisti
  - ✓ (co-)develops and participates in LL/testbeds/low regulation zones
- Presence in Flanders, China and the Middle East
- Founder of **G-STIC**, the Global Sustainable Technology Innovation Community

G·STIC GLOBAL SUSTAINABLE TECHNOLOGY & INNOVATION COMMUNITY

ACCELLERATING TECHNOLOGICAL SOLUTIONS FOR THE SDG's

PARIS2015 UN CLIMATE CHANGE CONFERENCE COP21·CMP11

ACTION-ORIENTED COMMUNITY BUILDING IN THE QUADRUPLE HELIX

- ANNUAL G-STIC CONFERENCE
- OUTREACH TO POLICY FORUMS
- INSPIRATIONAL EXPERT STORIES
- CLIMATE ACTION PROGRAMME

CO-HOSTS

vito, masen, JITRI, FIOCRUZ, CSIR, teri

REACH IN 2022

7,900 PARTICIPANTS

80,000 VISITORS WEBSITE

GLOBAL REACH

22,000 PARTICIPANTS

320,000 VISITORS WEBSITE

10,000 SUBSCRIBERS

6,900 FOLLOWERS

G-STIC CONFERENCES: UNITING 11,000 UNIQUE PEOPLE FROM 140 COUNTRIES WITH 1,500 SPEAKERS

- 2017 — 1,000 PARTICIPANTS
- 2018 — 1,400 PARTICIPANTS
- 2019 — 2,000 PARTICIPANTS
- 2020 — 3,700 PARTICIPANTS
- 2021 2022 — 3,900 PARTICIPANTS (Lazarus Chakwera, G-STIC Dubai)
- 2022 — 3,750 PARTICIPANTS (LOVE TOMORROW)
- 2023 — 4,200 PARTICIPANTS

UPCOMING EVENTS

- 2023 — 27 JULY — LOVE TOMORROW CONFERENCE
- 2023 — 22 – 23 NOVEMBER — URBCARE CONFERENCE
- 2024 — 17 – 21 MARCH — FLANDERS TECHNOLOGY AND INNOVATION
- 2024 — 22 – 24 OCTOBER — G-STIC CONFERENCE DELHI

International collaboration in the energy domain

Examples of deployment of sustainable solutions:

- G-STIC Climate Action Programme
  - ➢CAP-projects in Kenya and in Tanzania
- Living Lab/Low Regulation Zone
- Battery testbed CSIR in South-Africa

G-STIC CLIMATE ACTION PROGRAMME

FINANCIAL SUPPORT FOR CLIMATE ACTION PROJECTS IN DEVELOPING COUNTRIES

RESULTS PROJECT CALLS

	PROJECT PROPOSALS	APPROVED PROJECTS	SUBSIDY	TOTAL PROJECT BUDGET
2021	65	13	€3.2 MILLION	€4.7 MILLION
2022	109	19	€15.7 MILLION	€29.3 MILLION
2023	102		€17,6 MILLION	

EXAMPLES OF CLIMATE ACTION PROJECTS

GENERATING SUSTAINABLE ENERGY WITH HYDROPOWER IN REMOTE REGIONS

TURBULENT HydroBox nubian

SOLAR-POWERED DECENTRALIZED DRINKING WATER PRODUCTION

BOSAQ howest vito

DEVELOPMENT OF A SCALABLE, CIRCULAR URBAN AGRICULTURE MODEL

rikolto

COORDINATORS

G-STIC DEPARTEMENT OMGEVING

PARTNERS

CTCN

FINANCED BY

Flanders State of the Art

G-STIC Climate Action Programme

- Following from a clear choice made by the Government of Flanders to meet their engagement in International Climate Finance
- Started in 2021: a new, young programme
- Coördinated by the Department of Environment, in collaboration with G-STIC
- In line with climate policy & actions of the country where the project is executed

Flanders
State of the Art

G·STIC

G-STIC Climate Action Programme: ins and outs

- Projects 'on the ground' by a Flemish organisation in a developing country
- Both climate adaptation and mitigation
- Climate accountability of projects: Riomarkers handbook of the OECD
- Project types:
  - Dissemination focuses on the dissemination and/or roll out of research and/or policy results.
  - Capacity building focuses on strengthening knowledge, skills and/or resources.
  - Demonstration projects focus on the demonstration and/or upscaling of market-ready innovative solutions in the local context.
- Themes: energy, environmental policy, water & sanitation, transport, biodiversity, agriculture, education & research

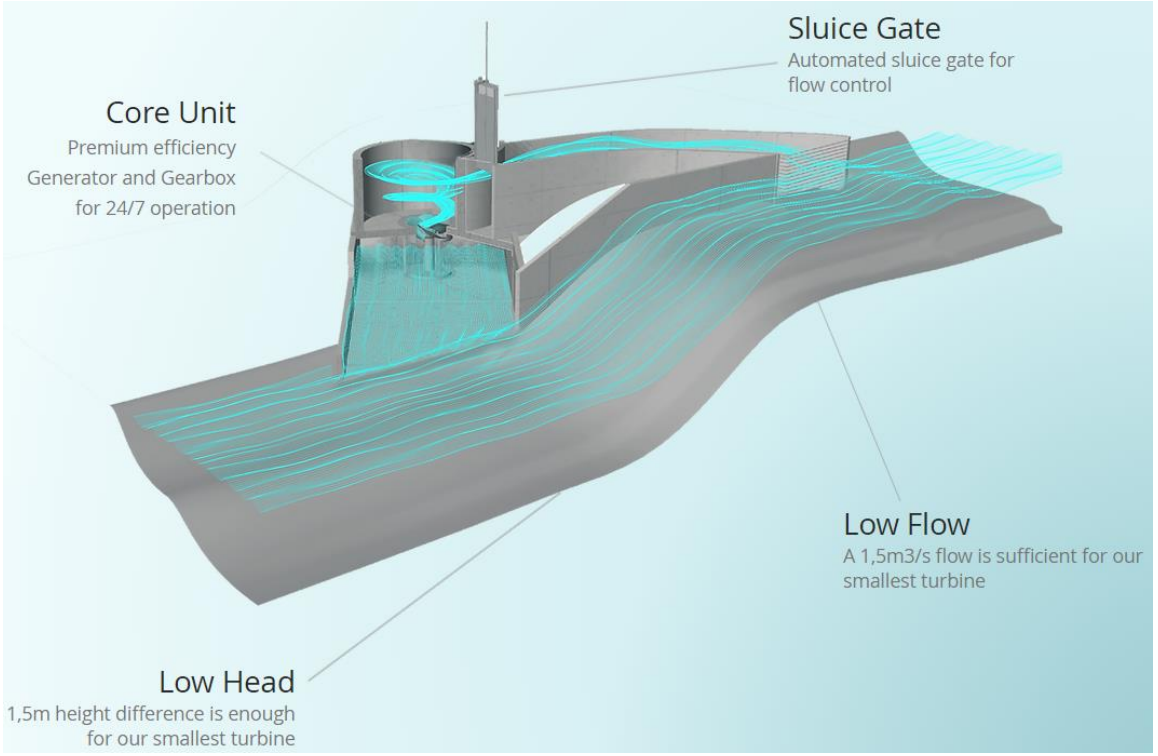
Flanders
State of the Art

G·STIC

CAP PROJECT 1

Demonstration project

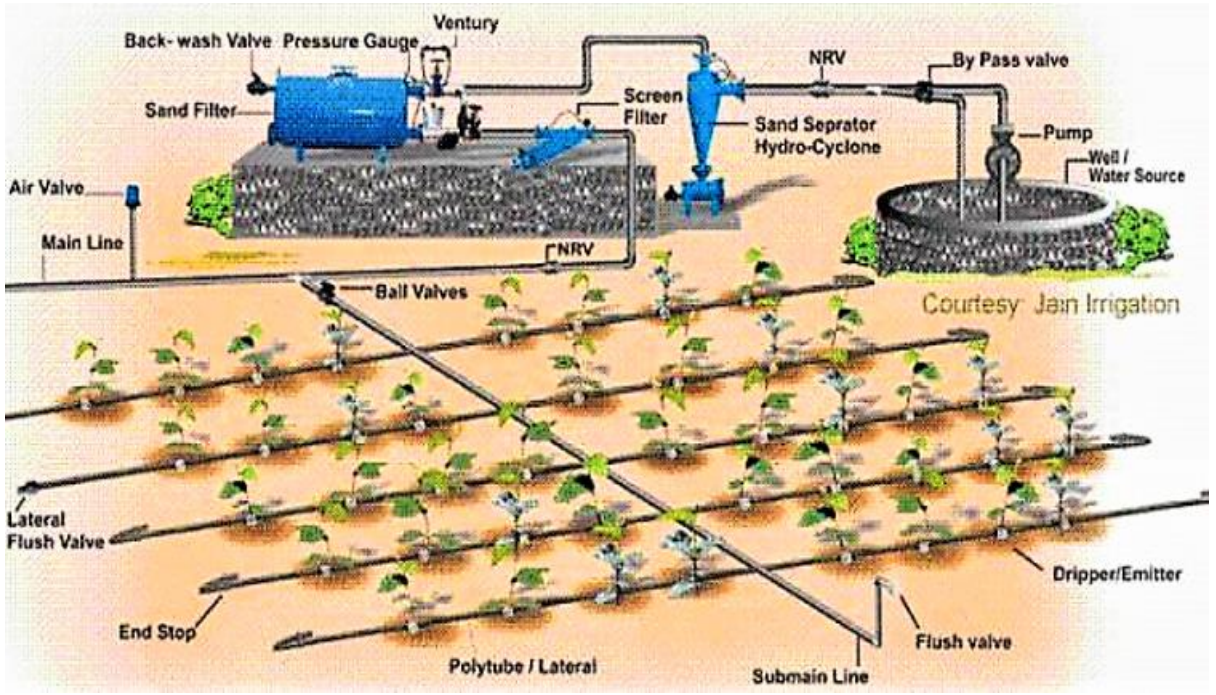
- **development of a sustainable source of electricity in Mathioya Subcounty in Kenya**
- **3 Flemish companies: Turbulent, HydroBox and ByNubian.**
- **hydroelectric mini-grid turbines have the capacity to deliver 210 kW, day and night,**
- **without harming river ecosystems.**
- **elimination of 840 tonnes of CO2 emissions per year**
- **the minigrid will connect 500 households, 10 schools, 10 businesses and 3 hospitals,**



CAP PROJECT 2

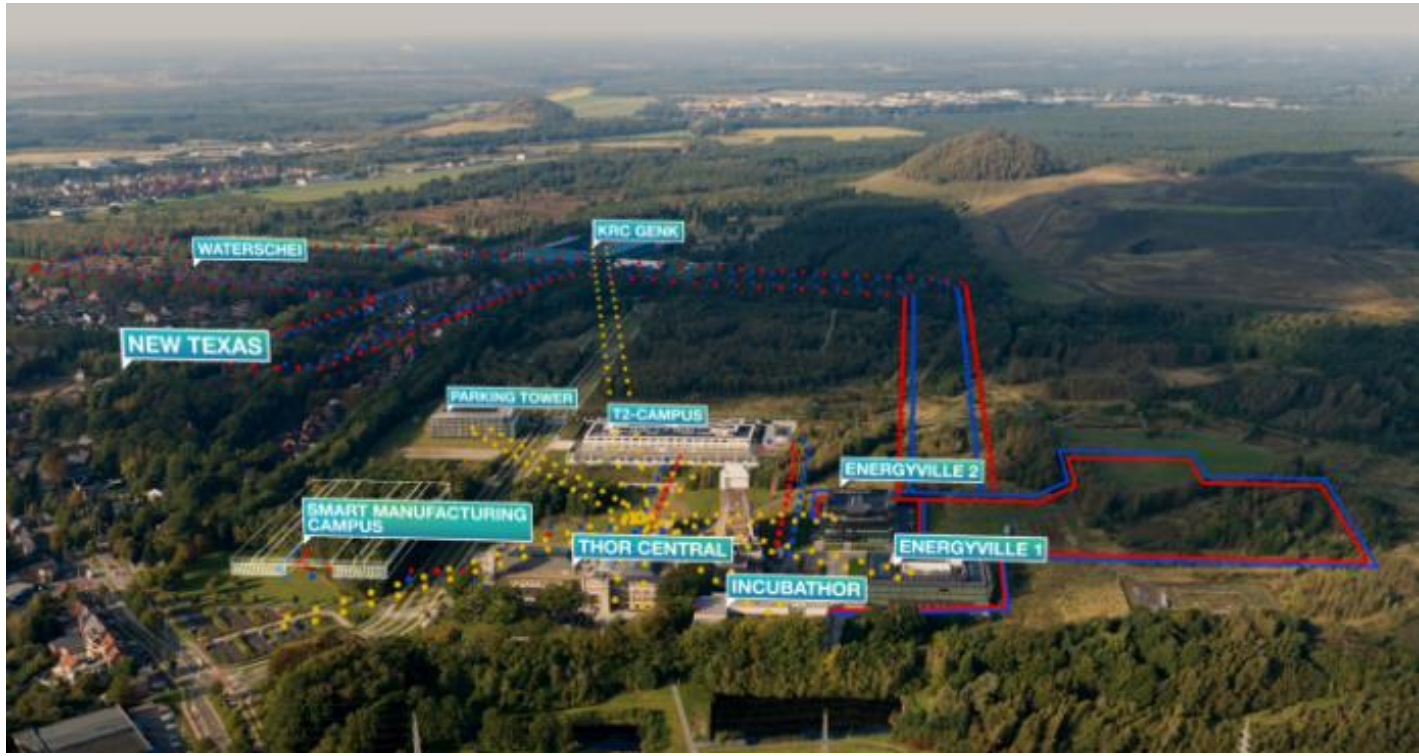
Demonstration project

- executed in Tanzania by Rikolto and Simusolaren,
- major draughts and erratic meteorological conditions
- major problem of water scarcity in combination with increasing water demand
- the use of integrated solar-powered drip irrigation systems will be demonstrated and scaled up.
- save water, energy and labor of small farmers.
- training sessions and demonstrations will be given on methods to retain water, and on financial management
- at least 700 vegetable and fruit producing households in four regions and 9,000 farmers will be trained
- reduced dependence on fossil fuels



Thor Park: Low Regulation Zone and Living Lab

- 1st low-regulation zone in Flanders early 2020, Thor Park in Genk
- Evolution from a centralized, top-down energy system to a more distributed system, where end users are also producers (prosumers)
- Collaborative research of transformative energy technologies and future energy systems
  - with sufficient freedom
  - in a safe and controlled environment,
  - to support and develop future policy and regulation.



- Thematic restriction: 'exception regime' applies to 'energy' only
- Time constraint: for five years – with the possibility of an extension by another five years.
- Fits in closely with the concept of the local energy community or 'LEC',
  - Produces, stores and consumes energy
  - Formed by a cluster of buildings and companies with locally coordinated and optimised energy management.
  - Allows research into future energy markets and how they might be organised and regulated.

Battery testbed in South-Africa

- CSIR (Council for Scientific and Industrial Research), co-host of G-STIC
- Collaboration since december 2020 between CSIR and VITO to provide support and guidance for companies in the local battery value chain
- Financial support by the Government of Flanders for the indoor battery testbed and funding of the project activities, through training and capacity building, and the required testing infrastructure.

- Battery testbed in full operation supports South African stakeholders across the whole value chain, from battery producer to end user.
- Procurement of key components for the indoor testbed: battery tester and climate chamber
- Additional testing and measuring equipment by VITO.

Thank you for your attention

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