



THE PALACE OF THE ACADEMIES



Usquare

New models for monetary economics

Maths and society seminar – workshop 28 june 2024 – Brussels

Nahla Dhib

Goéric Timmermans



CONVIVIAL PLANET



BriAS



CLEA

Centre Leo Apostel for
transdisciplinary research
Vrije Universiteit Brussel

LARIIS^{CerSo}

Laboratoire de recherche
interdisciplinaire en intervention sociale

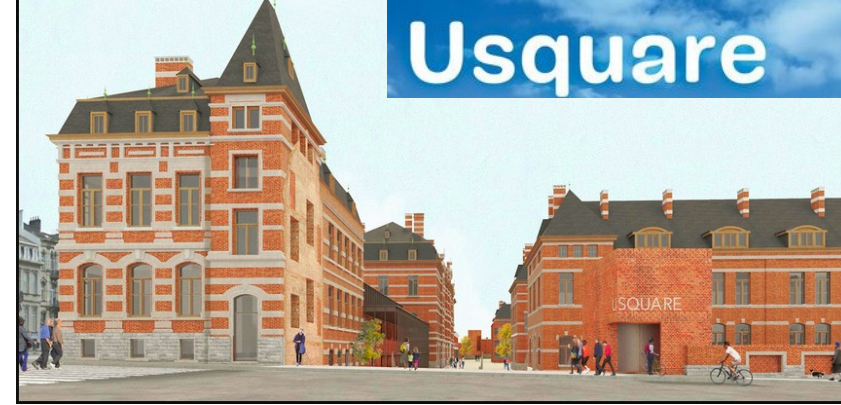
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Multiple crises

- ecological crisis
- climatic crisis
- financial crisis 2008
- Covid crisis
- ...

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Multiple crises

- ecological crisis → « green »
- climatic crisis → CO2 emissions reduction
- financial crisis 2008 → taxes and regulation
- Covid crisis → public debts? post covid models?
- ...

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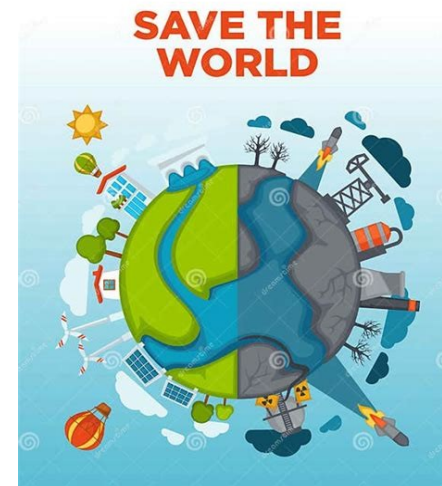


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Non-monetary economy versus monetary

- environment
- gift
- barter
- care ? social ? hobbies ?
- ...

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Giving nature an economic value

- Internalising externalities (Pigou)
- corporate sustainability reporting (CSRD)
- natural capital
- debt-for-nature
- redebt ?

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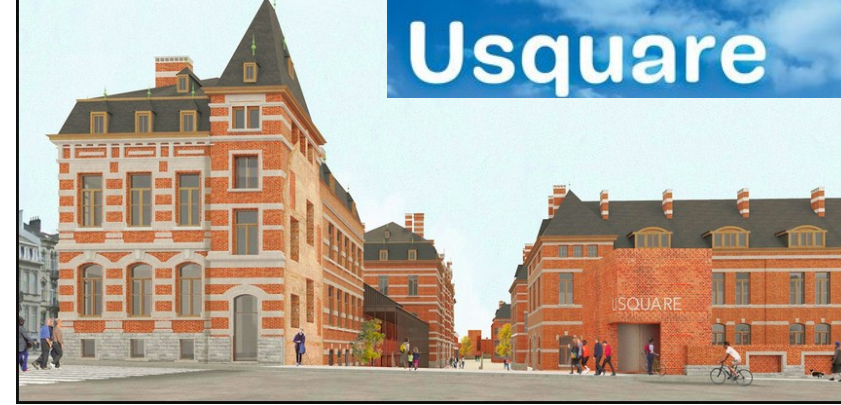
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Change currency



- complementary currencies (Bernard Lietaer)
- bartering (RES, Sardex, ...)
- ? currency for sobriety

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Euro-bonus project

- complementary currency
- 1 Euro-bonus = 1 euro
- non-convertible
- creation based on the Basic Income
- credit without debt



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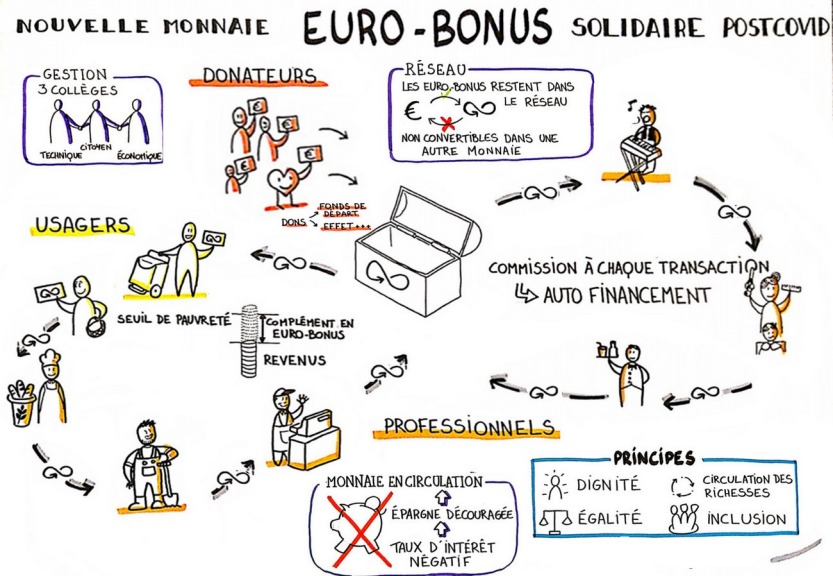
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Euro-bonus project



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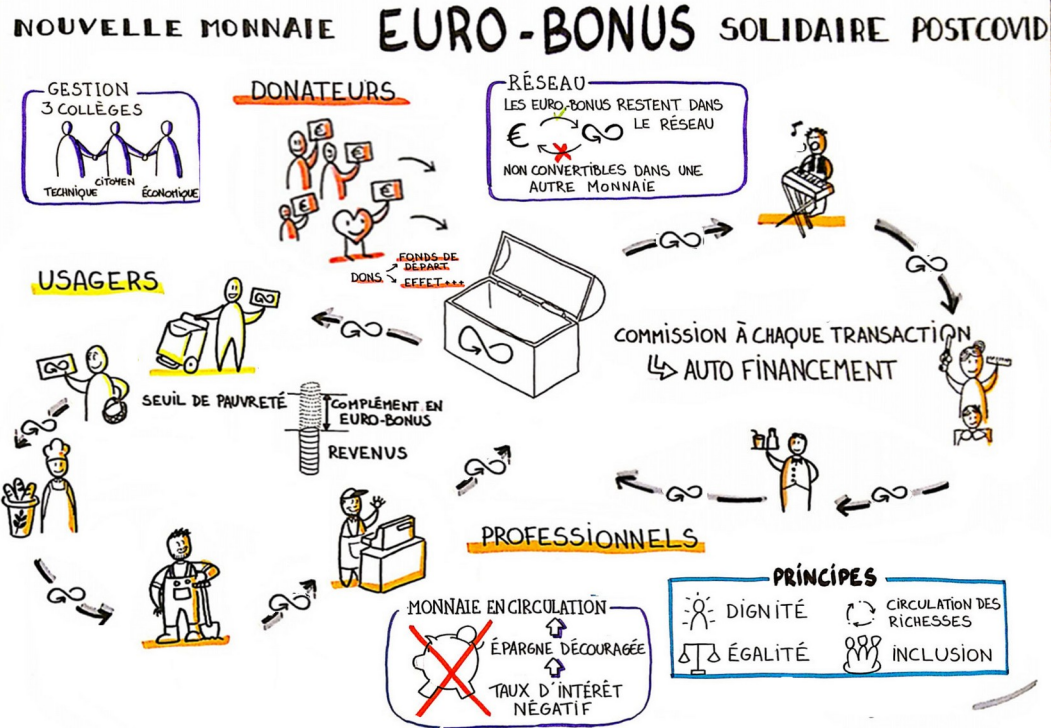


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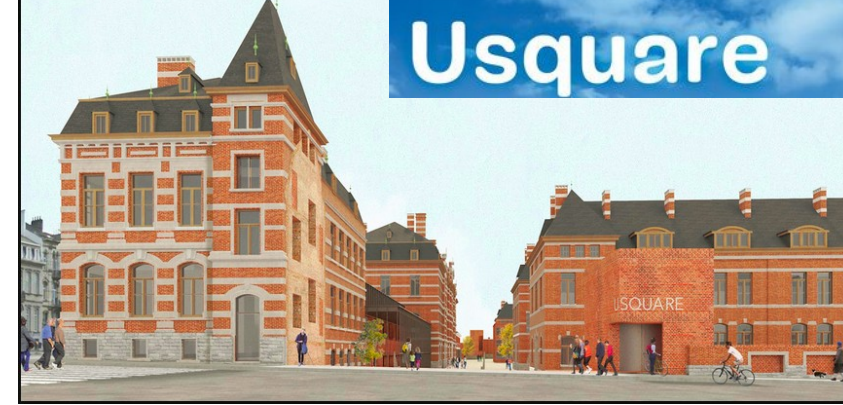
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Similar projects ?

- Corrent (Czech Republic – Pepe Rafaj)
- June Ğ1 (Relative Theory of Money - Stéphane Laborde)
- Le Sou Mayennais (Benoît Lavenier)
- ...

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Technical feasibility

- Coopek (France - Gérard Poujade)
- Loyaltek (RES - Robert Masse)
- Treezor (MLC - France)
- Kohinos (Doume – Stephan Gelberger)
- Blockchain (Switzerland/France – Lemman)
- ...

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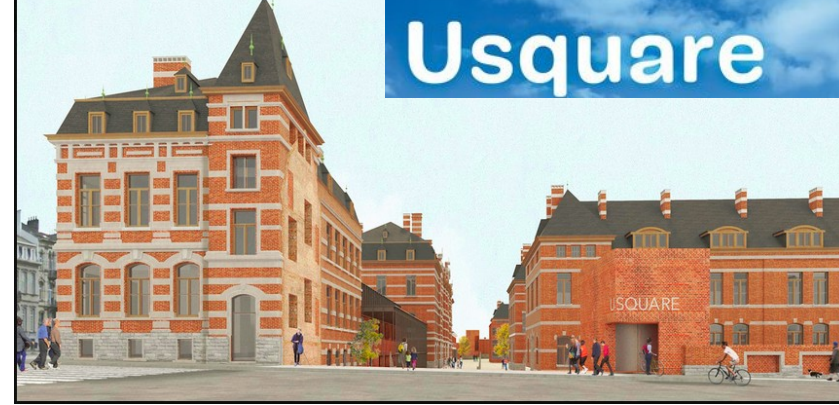


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Economic feasibility

- ex ante study
- mathematical models (Nahla Dhib)
- financial support



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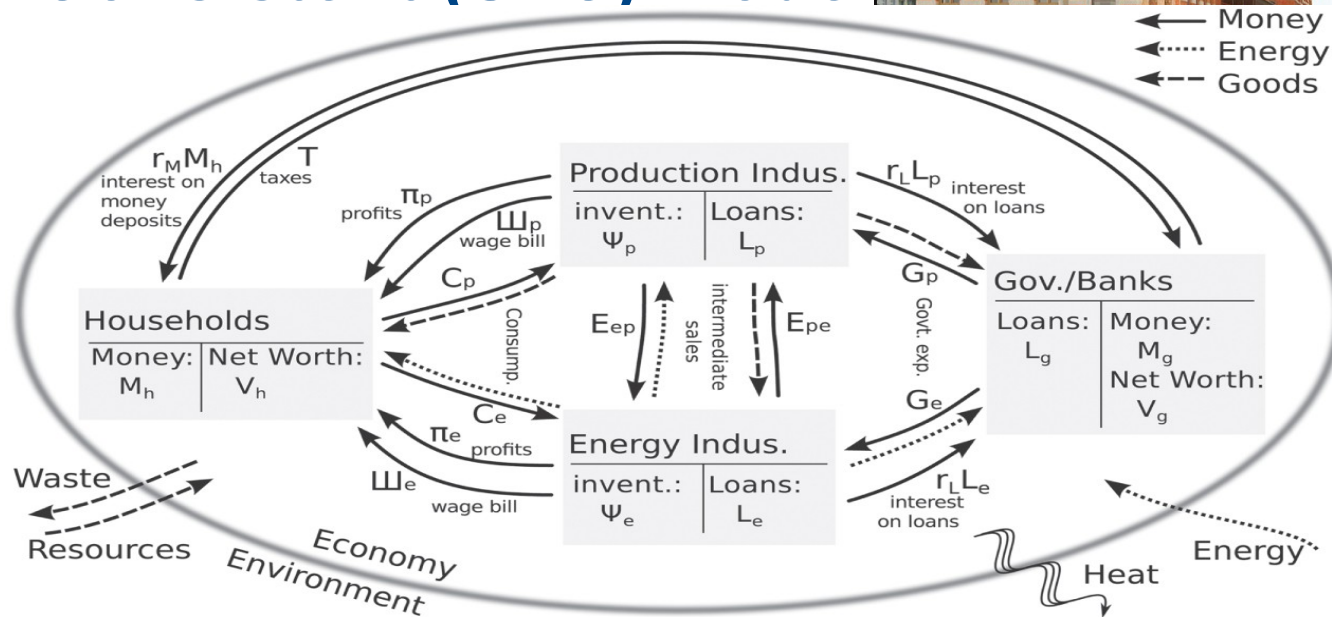
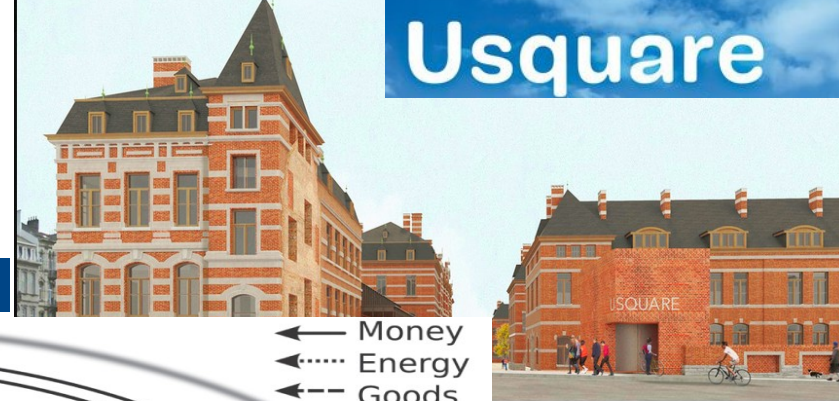
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Existing models : Stock-Flow Consistent (SFC) Model



Stocks of sectors and flow chart of money, energy, and materials of a Stock-Flow Consistent Input-Output Mode

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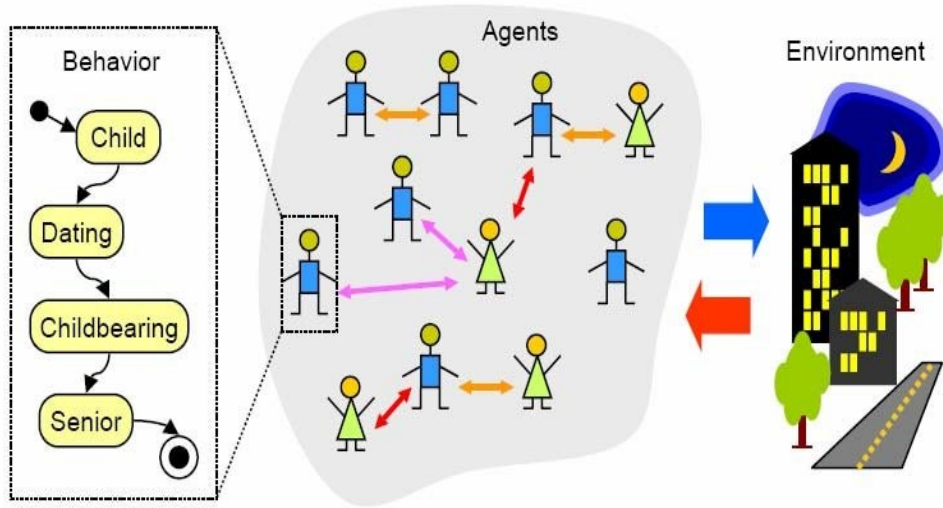
https://en.wikipedia.org/wiki/Stock-flow_consistent_model

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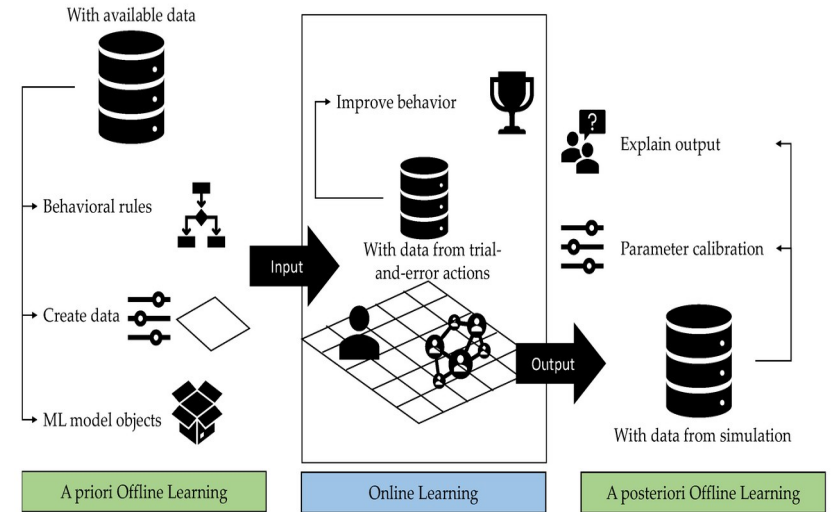
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.Agent-Based Model (ABM)



Agent-Based Modeling framework, wikipedia



Categories of ML applications in Agent-Based modeling.

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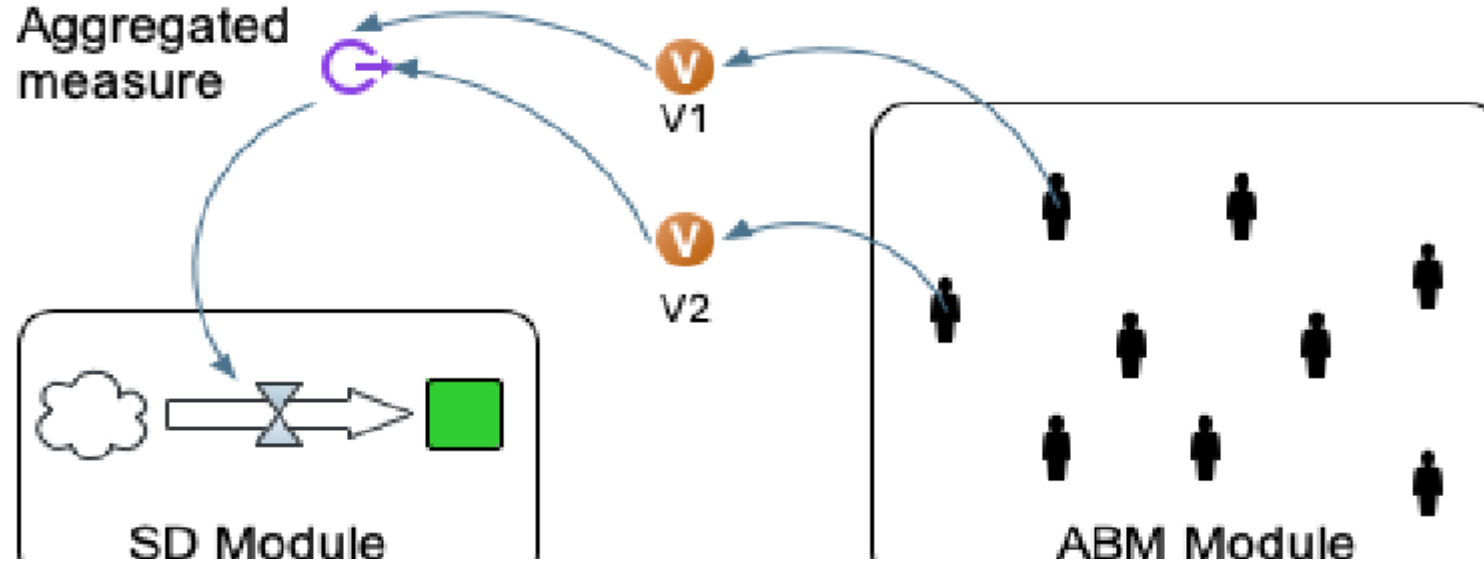


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Hybrid Models : combine elements of SFC-ABM, captures macro-eco trends and individual behavior



*« Stock levels bound aggregate measures of the ABM module »
Le Khanh Ngan Nguyen, Susan Howick, Itamar Megiddo (2022)*

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Develop Dynamic Model

-Why? (1) accounts for changes in user base, local need - (2) ensure the AC value- (3) helps us to forecast future behavior of Euro-bonus

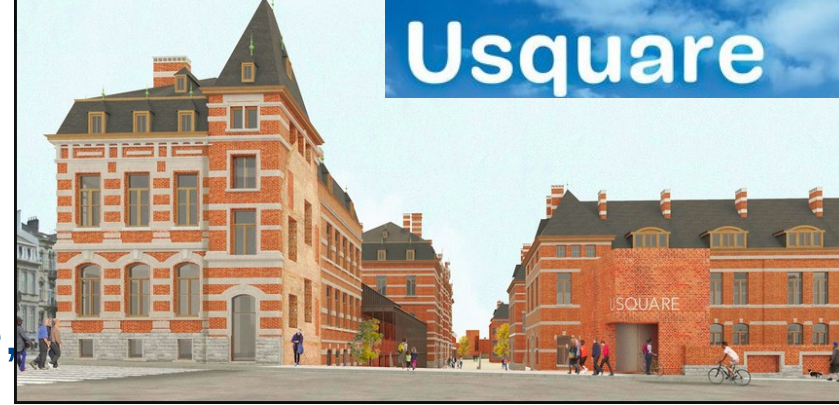
How? (1) considering economic factors, social aspects, and technological infrastructure - (2) uses mathematical tools : ED, Markov chain, SD

Challenges? (1) Validate a dynamic model to set up an AC (2) calibration as we look at successful AC that ensure realistic outcomes (3) financial support as pilot actions are crucial to implement an AC

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**<MM> is our powerful tool
to understand user behavior,
network dynamics and continuous monitoring AC
initiative.**



<https://coinmarketcap.com/alexandria/glossary/regional-local-community-currencies>
(Regio Network - Local Currencies)

<https://www.complementarycurrency.org/>
(The Democracy Collaborative - Complementary Currencies)

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Workshop June 2024



- ex ante brainstorming
- mathematical models (Matricial, tontines, games theory,...)
- financial support
- ...

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