





# Investors Insight on De(re)carbonisation

Oct 14th, 17.00-18.30 CET





#### **Tech Tour Team:**



Radostina Tsenova
Tech Tour Investors Club Lead
at Tech Tour
Facilitator



Aleksandra Angelova
Senior Project Manager,
leading Tech Tour Energy
in Transition Programme
Support



Adam Bocel
Assistant Project Manager
Support





#### **Housekeeping Rules**



- Recording the call
- Rename yourself with Name, Surname, Company
- Turn on your camera all the time
- Turn off your microphone active only when invited
- Chat functionality use it actively to ask in writing your Questions
- Useful key combinations you can use:
   Alt + A for Mute/Unmute
   Alt + H for opening the Chat



#### Agenda | Investors Insights session on De(re)carboinisation

#### Welcome

#### 1<sup>st</sup> PART: INSIGHTS

- Speaker 1 Bryan Hassin, Rocky Mountain Institute, CEO of the 3rd Derivative accelerator
- Speaker 2 Alfred Lam, Partner at Chrysalix
- Speaker 3 Jos Keurentjes, Programme director Energy Innovation in Twente university

#### • 2<sup>nd</sup> PART: INVESTMENT CASES

- Investor 1: Hans Maenhout, Finindus
- Investor 2: Leon Jacobs, SABIC
- Selected entrepreneurs in De(re)carbonization Tack in Tech Tour Energy in Transition Programme

#### WHAT'S NEXT:

- Tech Tour Energy in Transition Programme
- Tech Tour Investors Club
- Poll





#### **Leadership Team**

#### Chair





Remy De Tonnac,
General Partner at ETF Partners, Chairman
of Tech Tour Investors Club Council

#### **Moderator**



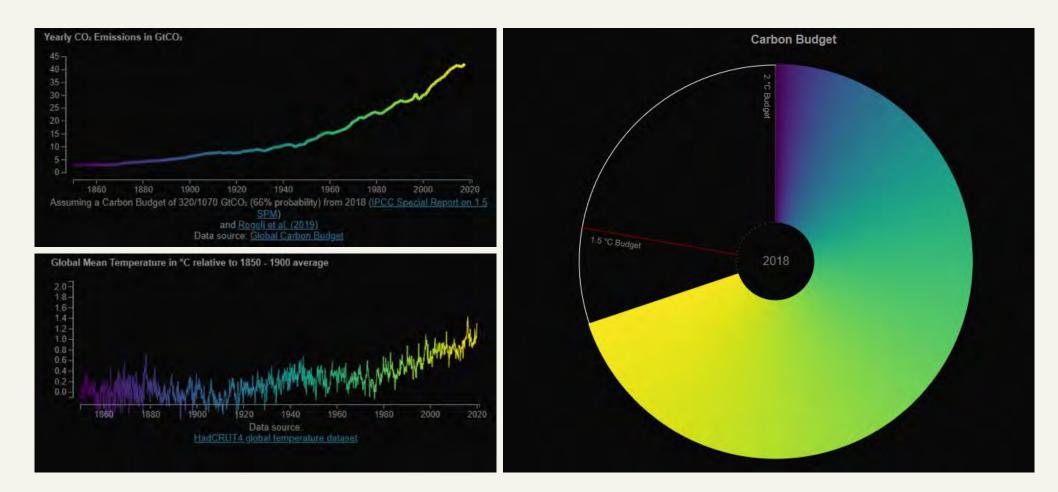


Fred van Beuningen,
Managing Partner at Chrysalix and Head of
Selection Panel on De(re)carbonization in Tech
Tour Energy in Transition Programme



# 10Y of current emissions remaining in carbon budget

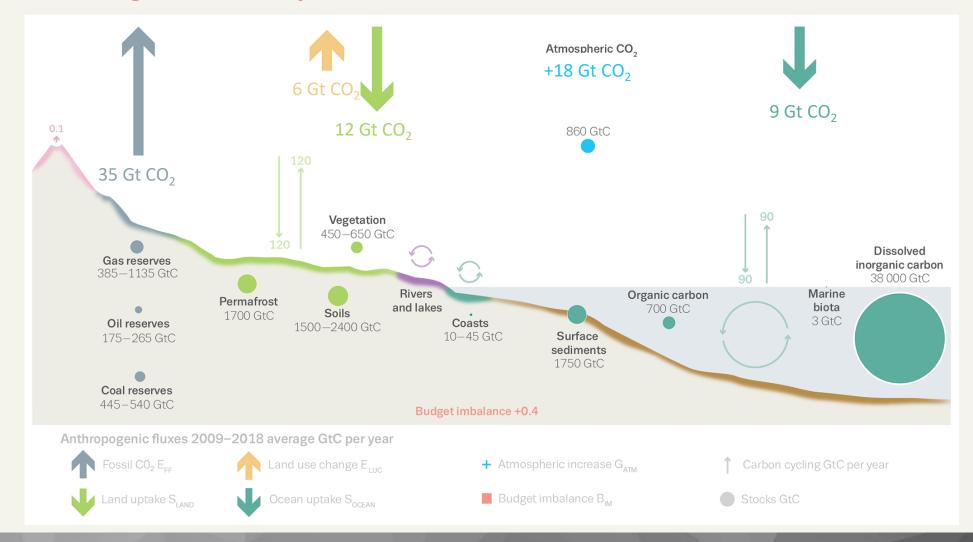
#### **Temperature and CO2 both trending upwards**





## Anthropogenic disturbance of the global carbon cycle

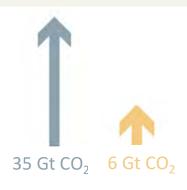
Restoring the carbon cycle: reduce emissions and enhance natural sinks

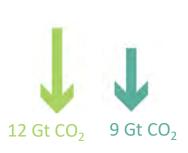




## Carbon neutrality as a minimum requirement

#### **Towards negative emissions**





Atmospheric CO<sub>2</sub>

+18 Gt CO<sub>2</sub>

#### **Emission reduction**

- Energy demand reduction
- Energy supply decarbonization
- Industrial CO2 management

#### Sink enhancement

- Afforestation & reforestation
- Soil carbon sequestration
- Ocean fertilization
- Rock weathering

#### **Engineered solutions**

- Direct air capture and storage (DACCS)
- Bio-energy with carbon capture and storage (BECCS, hybrid solution)

Negative emission technologies



## Carbon neutrality has become a strategic imperative

**Companies set net zero targets by 2050** 

































# 1<sup>st</sup> Part: INSIGHTS Presenters of the session:





Bryan Hassin,
Rocky Mountain Institute, CEO of the 3rd
Derivative accelerator





Dr. Alfred Lam, Partner at Chrysalix



UNIVERSITY OF TWENTE.

Jos Keurentjes, Programme director Energy Innovation at University of Twente



1<sup>st</sup> Part: INSIGHTS

Presenters of the session:

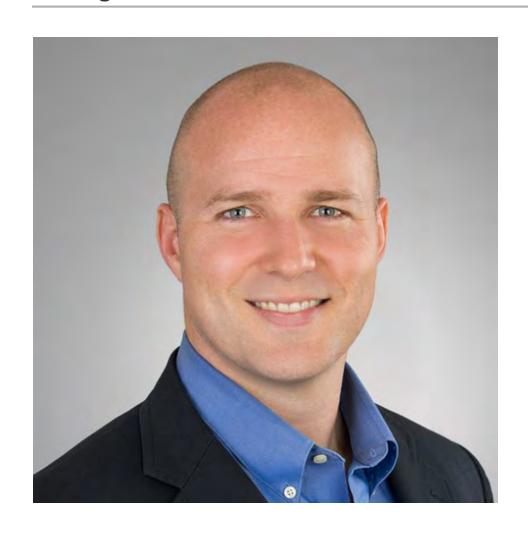
#### **Speaker 1:**



Bryan Hassin,
Rocky Mountain Institute, CEO of the 3rd
Derivative accelerator



# Bryan Guido Hassin, D<sup>3</sup> Cofounder/CEO



- Climatetech entrepreneur with \$125M of exits
- Mentor and board roles for startups worth \$9B
- Formerly CEO of Smart OES, CEO of R7 Solutions, and CTO of Antmachine
- Intersection of Energy and IOT
- Mostly startups, but some corporate spinouts
- Mostly USA, but some EU

# Climate: *the* challenge opportunity of our lifetime

A 1.5 °C pathway requires *annual* average investment of USD\$2–3

TRILLION for 30 years

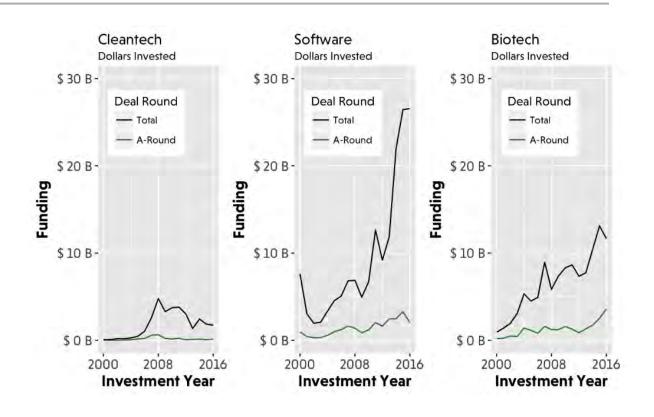
2-3 "gigaton-scale" techs\* must emerge every year for the next decade

<sup>\*</sup> Technologies with >0.5 gigaton CO<sub>2</sub>e end-market reduction potential per year in 2030-50



# Climatetech is woefully underinvested

- The way we make and use energy is a multitrillion-dollar market experiencing dramatic, once-in-a-century transformation.
- Despite the size of the market and the need, climate tech VC investment is modest and weighted towards later-stage and software.
- Critical new technologies and business models



# We are not on track to meet climatetech goals

### **E&E**NEWS

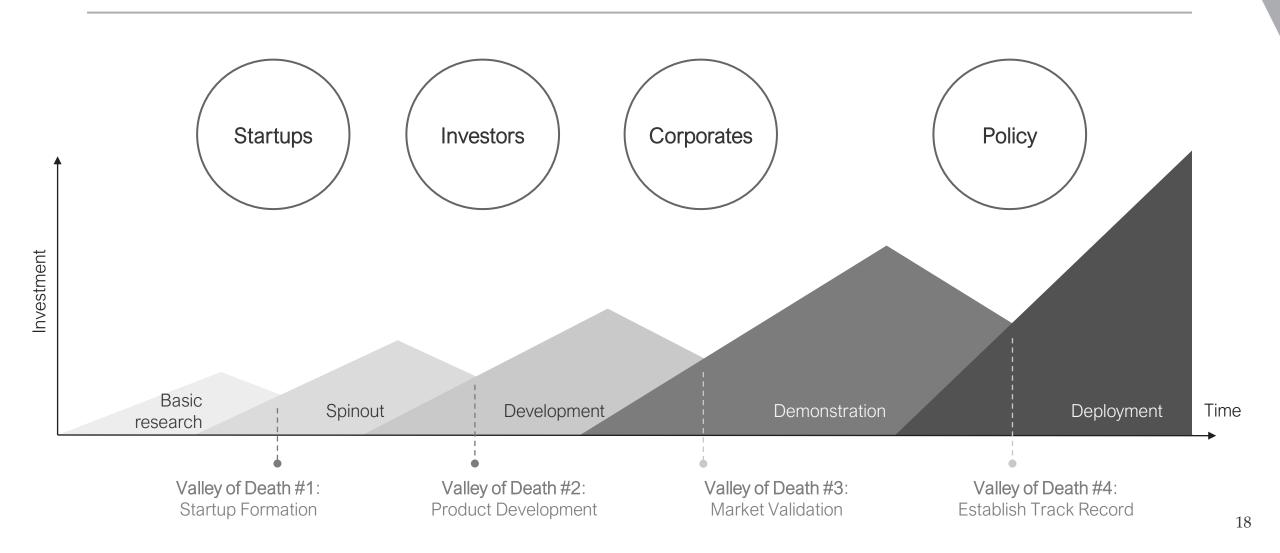
ENERGY

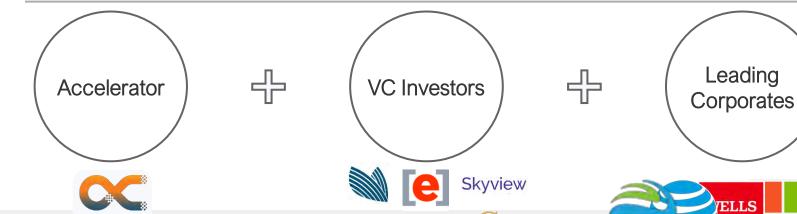
# Most Clean Energy Tech Is Not on Track to Meet Climate Goals

A new report says that only six of 46 clean energy sectors are making enough progress to limit warming to under 2 degrees Celsius

By Miranda Willson, Carlos Anchondo, E&E News on June 10, 2020

## Multiple stakeholders => multiple valleys of death







 Global network of 90 accelerators in 30 countries

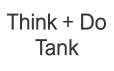
**NEXUS** 

- Rapid capacity building and business model validation
- De-risking startups for follow-on investment

- Hundreds of millions in VC funds
- Professional teams with proven track records
- Investment in accelerator startups
- Accelerator cohort selection and programming support
- Participant in follow-on funding



- Coalition of 12–15 leading corporates from diverse industries
- Startup coaches, customers, investors, and acquirers
- Investment thesis refinement and validation
- Peer-to-peer learning exchange

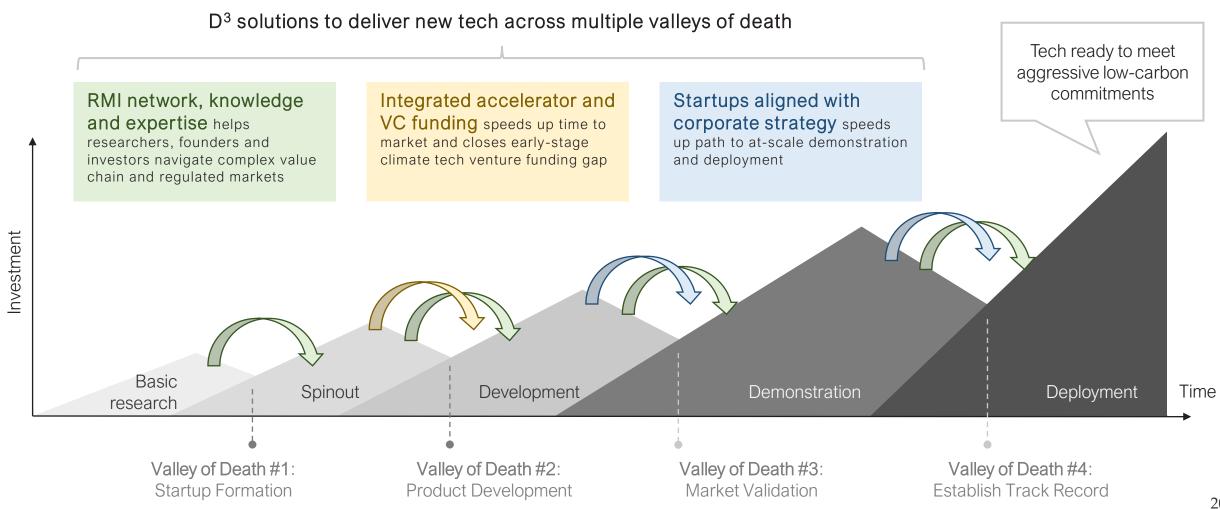




- 250+ energy professionals
- 7 Offices in US, China, India, Africa
- Analysis, insight generation, stakeholder engagement, network management
- Policy integration



## Vertical Integration to Bridge Valleys of Death





CEO Bryan Guido Hassin

- Seasoned energy & tech entrepreneur
- \$125M of exits & track record driving new disruptive ventures from launch to global scale
- Mentor, advisor, and director whose startups have created \$9B of enterprise value
- Formerly CEO of Smart OES, CEO of R7 Solutions, and CTO of Antmachine

# Third Derivative Team



Head of Investments and Research Cvril Yee

- MIT scientist >> entrepreneur >> investor
- Formerly U.S. cleantech and energy lead at IP Group, funding and spinning out high-potential tech from universities and national labs
- Led business development and strategy at INEOS Bio, building one of the world's first commercialscale advanced biofuel facilities



Head of Corporate Partnerships & Marketing Elaine Hsieh

- Cross-sectoral communicator & convener
- Former program director for GreenBiz VERGE focused on scaling solutions where technology accelerates systems thinking & sustainability across cities & industries
- Led marketing & comms at Generate Capital



Board Director
Danny Kennedy

- Long-time champion of 100% clean energy for 100% of the population
- CEO of New Energy Nexus
- MD of California Clean Energy Fund, President of CalCharge, and Co-Founder of Powerhouse
- Serial solar entrepreneur: co-founded Sungevity, Mosaic's first backer, Rooftop Revolution author



Board Director
Jon Creyts

- Global change leader focused on clean energy transition and Senior Managing Director at RMI
- Founded and co-led RMI's China program
- Board Member of Energy Web and WattTime
- Former Partner at McKinsey & Company and alumnus of Lockheed Martin's Skunk Works



Operations and Electricity Sector Lead Jason Prince

- Energy finance professional with strong innovation, market, and regulatory expertise
- Formerly RMI (utility business models, planning, procurement), SolarCity (structured finance), Karbone (energy financial services)



Director of Startups
Ryan Kushner

- The Accelerator Guy; author of "Accelerate This!"; mentor at Techstars, Big Ideas Ventures
- Global curriculum lead, New Energy Nexus
- Formerly Free Electrons, Singularity University, Elemental Excelerator, and many others



Industry Sector Lead

- Josh Agenbroad
- Serial intrapreneur who helped found RMI's China and Africa energy access programs
- Principal at RMI focused on technology, market, and policy topics across automotive, freight, heavy industry, manufacturing, and utilities



Research & Investment Associate

#### Madeleine Carnemark

- Coalition building experience
- Dual MBA/MS in sustainability with environmental justice focus
- Formerly regenerative agriculture research and policy in Washington, D.C.



Transportation Sector Lead

#### Hara Wang

- Globally-minded investor and problem solver
- Formerly Braemar Energy Ventures (cleantech VC), McKinsey & Company (North America), Clean Energy Associates (China)
- Entrepreneur re: energy access in rural Africa



Advisor

#### Elizabeth Hartman

- Bridger of energy & entrepreneur communities
- Manager in the Office of CEO at RMI
- Led EPRI's Incubatenergy Network (20+ clean energy incubators/accelerators, 500+ startups)
- Formerly E Source, Simple Energy



**Buildings Sector Lead** 

#### Ankit Kalanki

- Background in mechanical engineering, energy technology & policy
- Technical lead, RMI's Global Cooling Prize
- Former energy engineer, energy-efficiency consultant in India

# D<sup>3</sup> partner ecosystem is growing rapidly

#### **CORPORATE**

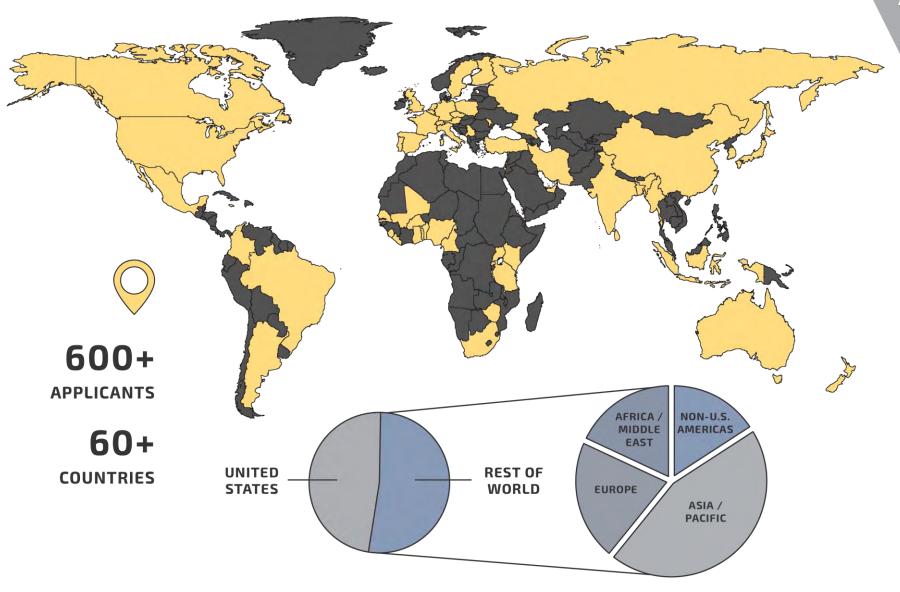
- USD \$4T Market Cap
- Global
- Spanning Crucial Sectors
  - Energy
  - Technology
  - Finance
  - Transportation
  - Industry / Buildings

#### **VC INVESTOR**

- USD \$2B AUM
- Global
- Spanning Technology Areas
- Spanning Investment Stage

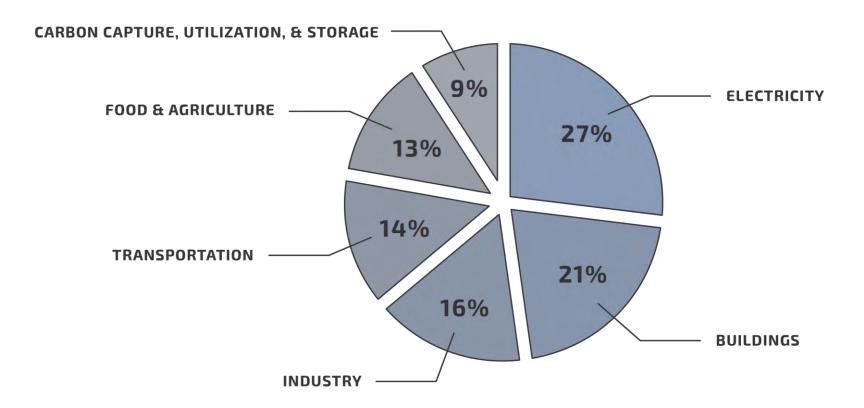
### A Global Response to a Global Need

The climate crisis is a global challenge, and the global community of climate tech startups responded... with more than 620 applicants from 61 countries.



# Tackling Diverse Opportunities for Decarbonization

While electricity-related projects accounted for the greatest number of submissions, other industries were also well-represented, enabling us to tackle low-carbon innovation on multiple fronts.

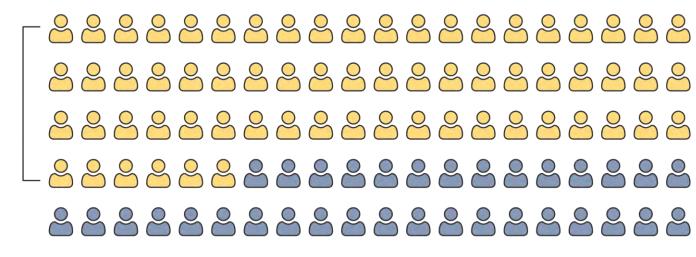


# Finding the Best Solutions from a Diverse Community

In addition to the geographic diversity of the applicants, we're proud to say that fully two-thirds of applicants self-identified as female, veteran, and/or person of color.

66%

OF APPLICANTS
IDENTIFIED AS
FEMALE,
VETERAN,
AND/OR
PERSON OF COLOR





**6 APPLICANTS** 





#### 1st Part: INSIGHTS

#### **Presenters of the session:**

#### **Speaker 2:**



Dr. Alfred Lam, Partner at Chrysalix



# **Tech Tour Energy in Transition**

**INVESTOR INSIGHT SESSION ON DECARBONIZATION** 

## **Chrysalix Venture Capital**

#### EARLY STAGE INDUSTRIAL INNOVATION FUND

CRV Fund - \$120M+ Decarb Fund - \$100M+

Worldwide investments in early stage startups



#### **Global coverage**

North America Europe Asia

#### **Investment Focus**

#### What we will be looking for

Market driven opportunities;
Seed and Series A

Startups addressing our investor's innovation needs

Energy Transition & Step-change innovation

#### **Industries**

Oil & Gas, Utilities, Metals & Mining, Chemicals, Manufacturing Mobility & Construction

#### **Technology Scope**

Decarbonization & Resource
Productivity Solutions
Industry 4.0: AI, IoT, sensors,
robotics etc.

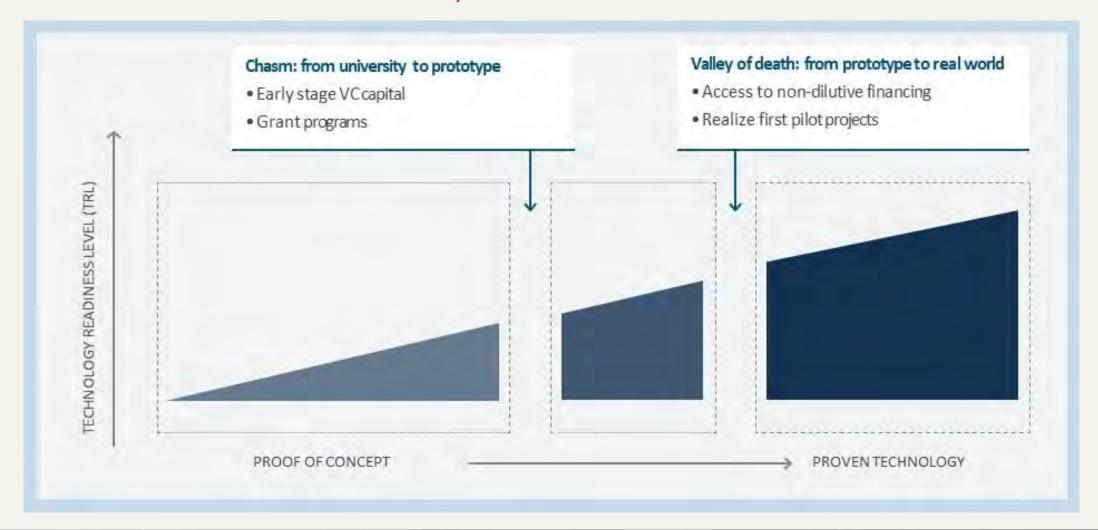
#### **Current & Historical Investors**





## **Evolving & Maturing Ecosystem**

#### ALIGNING OF GOVERNMENT POLICY, CORPORATE STRATEGY & ACCESS TO FINANCE





### **Framework for Evaluation**

#### VALUE PROPOSITION, ECONOMICS & RISK

GHG Feedstock	Conversion / Transport	Valuable Product	
Access to concentrated or abundant GHG	What is the CAPEX?	Single/Multiple market application and	
(CO <sub>2</sub> or CH <sub>4</sub> ) feedstock?	<ul><li>Modular?</li><li>Large halance of plant?</li></ul>	value streams?	
Feedstock Specifications	<ul><li>Large balance of plant?</li><li>Large scale pilot/demo required?</li></ul>	Product Specifications	
<ul> <li>Annual supply (volume/mass)?</li> </ul>		<ul> <li>Used to make or process something?</li> </ul>	
<ul><li>Composition?</li></ul>	What is the OPEX?	Commodity product?	
Due nume consider no modula do	<ul> <li>Labor, Energy, Consumables?</li> </ul>	Annual production (mass/volume)?      Description (assertion 2)	
Pre-processing required?	Performance Metrics	<ul> <li>Purity/composition?</li> </ul>	
Geographically constrained?	• Yield?	Post-processing or sorting?	
	<ul><li>Throughput?</li></ul>		
Pay or get paid for feedstock?		Geographic limitations (i.e., logistics cost	
How is waste currently being managed?		too high?) – Used at source?	
<ul><li>How is waste currently being managed?</li><li>Venting? Flaring?</li></ul>		Product price? Volatility?	
		High value & low volume?	



### **Case Studies**

#### **CARBON CAPTURE & UTILIZATION**



#### **Putting CO2 to Work**

Veloxotherm process combines a patented adsorbent structure and rapid cycle thermal swing process to achieve unmatched economics for the oil & gas and chemicals sector



#### **Creating Clean Fuel out of Air**

Direct air capture technology that can deliver large-scale negative emissions by removing CO2 directly from the atmosphere and convert to transportation fuels



#### **Carbon to Concrete**

Manufactures a technology for concrete producers that introduces recycled CO2 into fresh concrete



# Process Technology to Convert CO2 to Major Chemicals

Electrochemical innovation to convert CO2 to polymer intermediate chemicals



# **Svante**







Access to Concentrated or Abundant Waste Feedstock	<ul> <li>Concentrated point source CO<sub>2</sub> capture</li> </ul>	<ul> <li>Direct air capture –         Abundant but Dilute CO<sub>2</sub>         concentration     </li> </ul>	<ul> <li>CO<sub>2</sub> sourced &amp; shipped to concreate manufacturer</li> </ul>	<ul> <li>CO<sub>2</sub> sourced from existing chemical processes</li> </ul>
Minimal Pre/Post Processing or Conversion	Direct use without conversion for EOR	<ul> <li>CO<sub>2</sub> solubilization/purity</li> <li>Product Separation</li> </ul>	• Direct use of CO <sub>2</sub> in concrete process	<ul> <li>CO<sub>2</sub> solubilization/purity</li> <li>Product Separation</li> </ul>
High Value Product/Use or Multiple Value Streams	<ul><li>Direct use for EOR</li><li>Feedstock for Urea production</li></ul>	Renewable Jet Fuel	• Concrete	<ul> <li>Platform for multiple commodity/specialty chemicals</li> </ul>
Multiple Market Application & Value Proposition	<ul><li>Oil &amp; Gas</li><li>Chemicals</li><li>Cement</li></ul>	Oil & Gas	<ul> <li>Construction &amp; Building Materials</li> </ul>	<ul><li>Oil &amp; Gas</li><li>Chemicals</li></ul>
Close Proximity of Waste Feedstock and point of use/sale	<ul> <li>Husky steam generators supply CO<sub>2</sub> for use on- site for EOR</li> </ul>	<ul> <li>Market only in California presently due to LCFS</li> </ul>	<ul> <li>CO<sub>2</sub> supply – Strong partner in Linde</li> <li>Concrete – Existing supply chain</li> </ul>	<ul> <li>CO<sub>2</sub> source available at chemical plants</li> <li>Chemical intermediates used onsite or shipped</li> </ul>
Modular systems w/ Rapid Payback & High Margins	<ul> <li>Modular capture technology</li> <li>Large CAPEX for applications</li> </ul>	<ul> <li>Modular system</li> <li>Economics dependent on carbon credits</li> </ul>	Retrofit of existing concrete process	<ul> <li>Modular electrochemical reactor but large BOP CAPEX</li> <li>T/day scale at pilot</li> </ul>





#### 1<sup>st</sup> Part: INSIGHTS

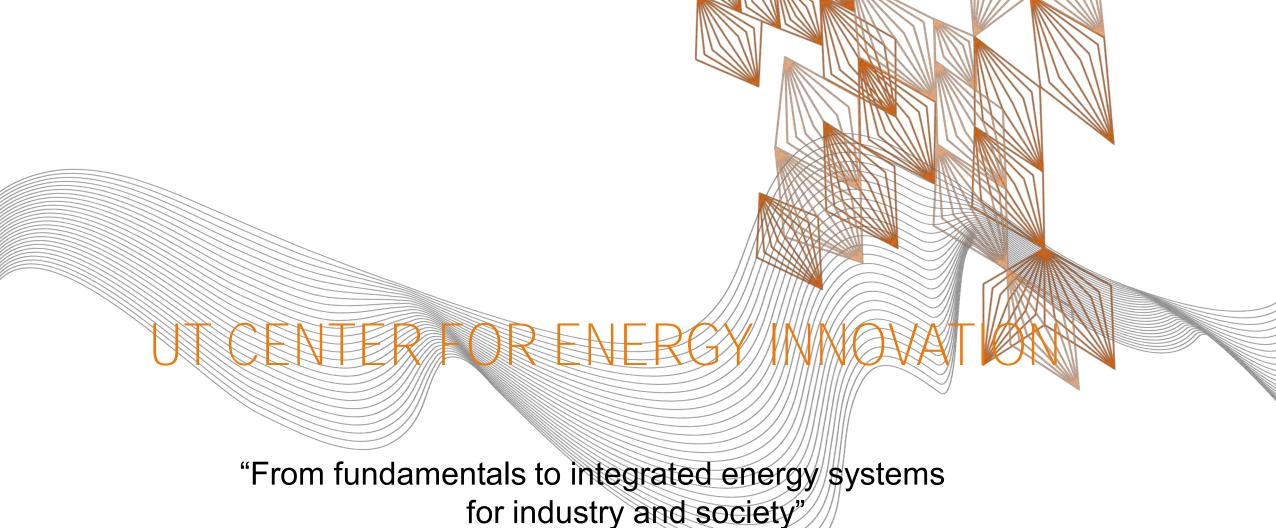
#### Presenters of the session:

#### **Speaker 3:**



UNIVERSITY OF TWENTE.

Jos Keurentjes, Programme director Energy Innovation at University of Twente



for industry and society"

Tech Tour Investors Club – Investor Insights session on De(re)carbonisation



## ENERGY INNOVATION AT UT

- Energy transition is one of the major societal transitions for the coming decades
- Major impact on citizens, governments and industry
- Energy is a central theme for UT: many researchers active on energy-related subjects: total turnover on this subject >60 MEur/year
- The Center for Energy Innovation (CEI) established in fall 2019 to create coherence, impact and visibility
- All faculties involved; strong links with institutes and strategic impulse programs
   Materials and Al



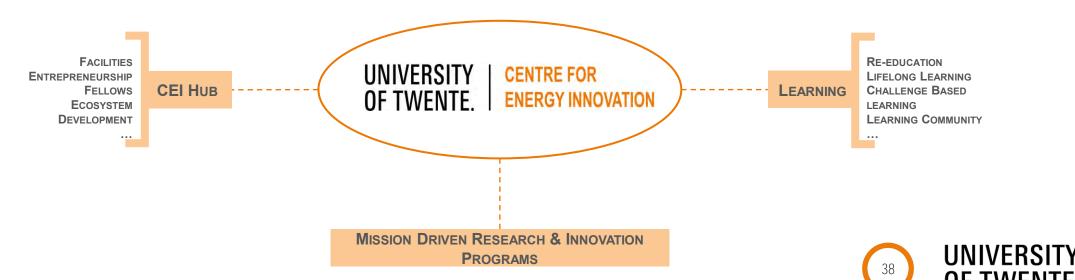






## THREE PILLARS FOR VISIBILITY AND IMPACT

- Coherent learning programs
- A single point of entry (Hub function) for external parties (governmental and industrial)
- Large mission-driven research programs
  - Battery technology and energy storage
  - Negative Emission Technologies
  - Low-energy data management / Energy-neutral datacenters
  - User-based distributed energy control / digitization of the energy system

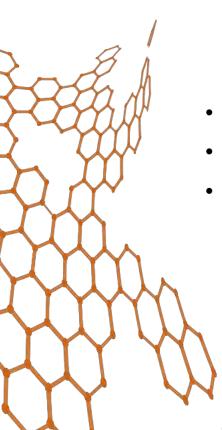


## LARGE MISSION-DRIVEN RESEARCH PROGRAMS

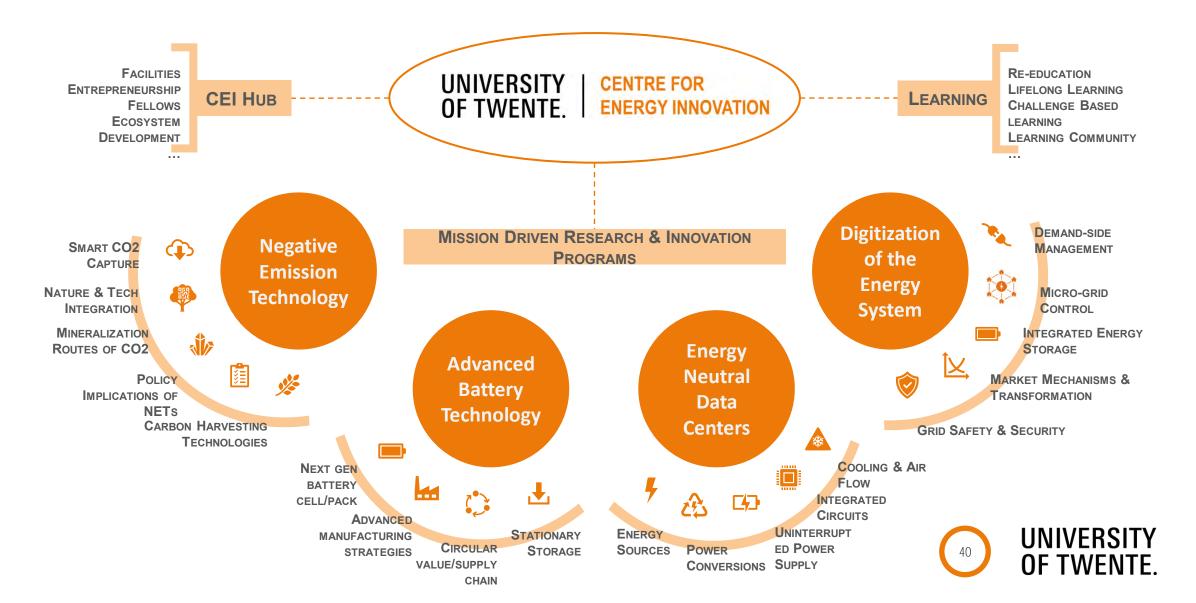
- Industry less interested in individual projects; often prefer a position in a large, visible and (internationally) recognized ecosystem, leading to faster innovation
- Some characteristics of such ecosystems
  - Focus on a well-defined scope
  - Industrial partners range: start-ups-SME-corporates
  - Partners cover the entire knowledge axis (TRL scale): fundamental-applied-deployment
  - Size matters: creating mass by aiming at 30-50 million euro annually (not only UT)
- Basis for the creation of start-ups (UT has track record of more than 750 successful startups)
- Archetypes are QuTech, Holst and Brightlands
- Strong interest from industry to participate with awareness of financial consequences; ecosystems under development







## Four mission-driven programs in scope











## 1<sup>st</sup> Investor: Finindus





Hans Maenhout,
Investment Director in Finindus

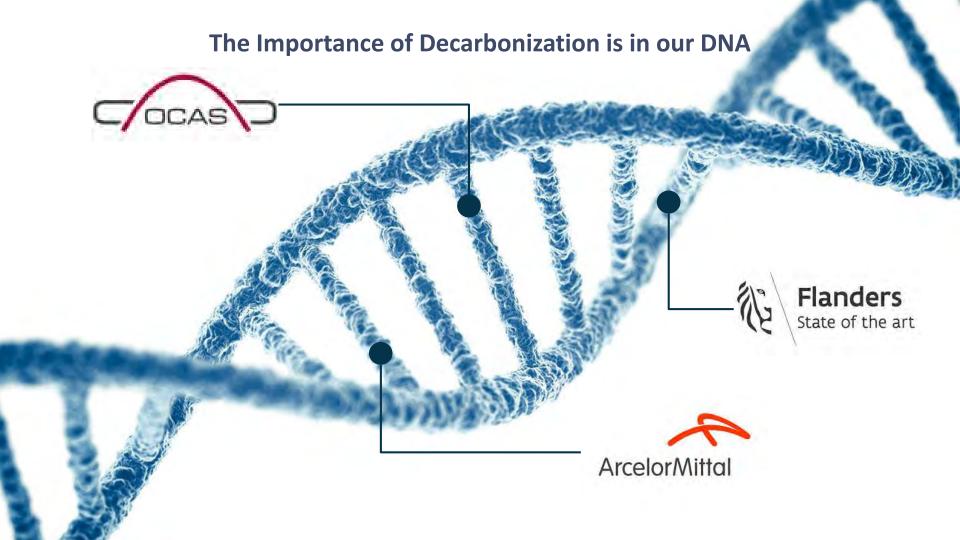
Reach Hans Maenhout at <a href="mailto:hans.maenhout@finindus.be">hans.maenhout@finindus.be</a>



### **Decarbonization @ Finindus**

October 16, 2020 Hans Maenhout







## Climate Action in Europe

Our carbon emissions reduction roadmap: 30% by 2030 and carbon neutral by 2050

"We have an ambition to reach carbon neutrality by 2050".

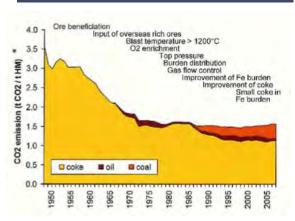
Lakshmi N. Mittal, Chairman and chief executive

25 June 2020 11:00 CET

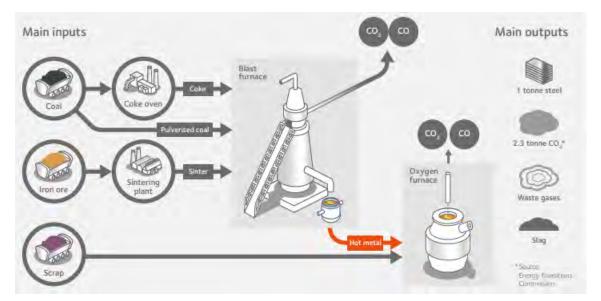
Arcelor/Mittal Europe sets out path to net zero by 2050, with pioneering technologies at the forefront of the company's roadmap for carbon-neutral steelmaking

### CO2 emissions are inherent to integrated steel making

## The journey from 3.5 to 1.7 ton CO2/ton steel is already done



Source: Ulcos presentation, 2013





#### **Routes to Decarbonization**

## **Energy and Material Efficiency**



CCS / CCU

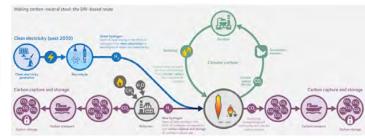














#### **How does Finindus Contribute?**









**PROJECT FINANCING** 







Guaranteed



















## Thank you







## 2<sup>nd</sup> Investor: SABIC Ventures





Leon Jacobs,
Sustainability Leader Europe at SABIC

Reach Leon Jacobs at Leon.Jacobs@SABIC.com







## Tech Tour Energy in Transition Programme De(Re)carbonisation Track: Selected Entrepreneurs

bright

**Bright Energy** 

Recycling Technologies Ltd.



HYGEN

**HYGEN** 



**LXP Group GmbH** 

TechnoCarbon Technologies





**NexWafe GmbH** 

**WePower** 



# Poll Suggest, what else we could do to support your activities Tell us now Send comment in the chat Send email to TT team International Venture Club





the collaborative programme for growth entrepreneurs, investors & partners



**City of Rotterdam** 







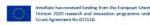




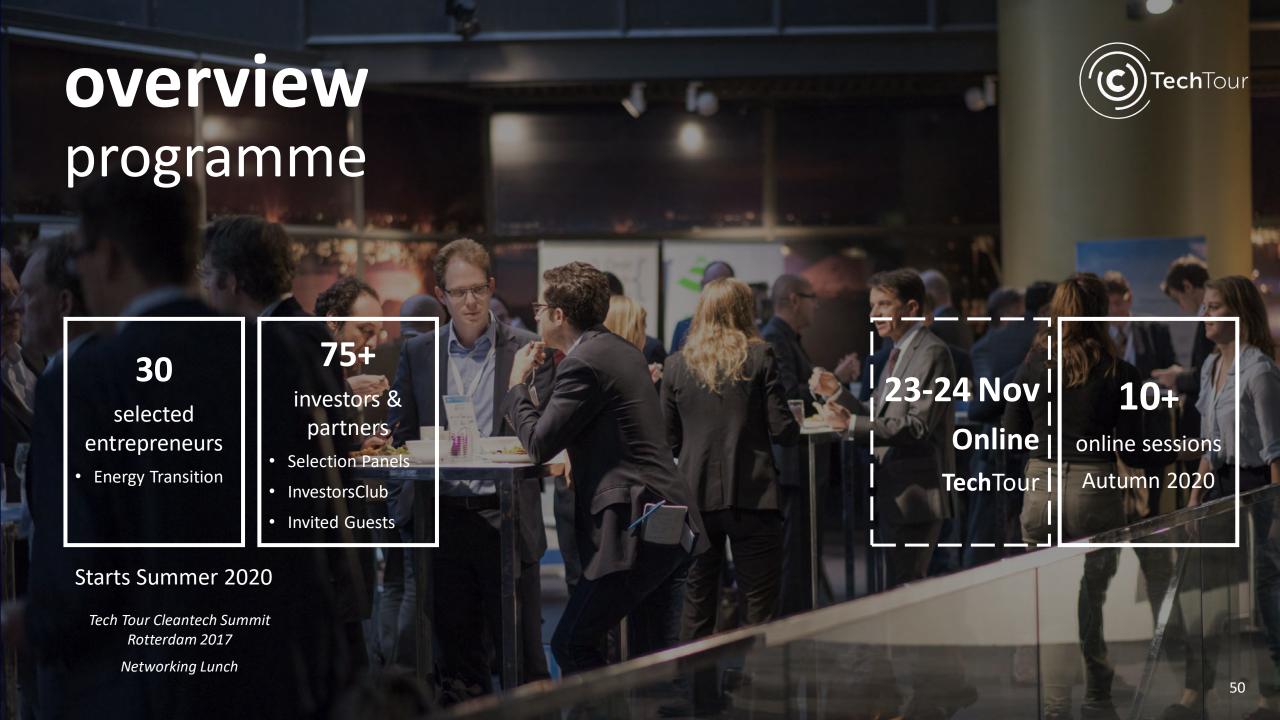






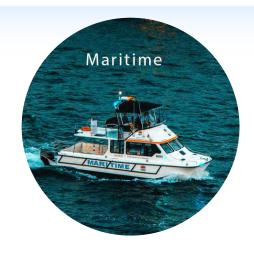














## De(re)carbonisation

- Renewable energy generation,
- Energy Storage and Distribution,
- Carbon Capture and Utilization, Re-used Carbon,
- Plastics (Chemical) Recycling,
- Bio-based Chemicals

## Energy Efficiency & Digitalisation

- Energy-saving Automation, Smart Grid,
- Cyber security,
- Demand Response,
- Digital platforms: transparency, booking and load-bundling

### **Maritime & Offshore**

- Renewable energy for ports,
- Alternative fuels for ships,
- Offshore renewables and circular topics, CO2 reduction,
- Port Automation,
- X Border Trade & Ecommerce,
- Port Call Optimization,
- Track and trace of containers

# Hydrogen & Alternative Fuels

www.techtour.com

## Tech Tour Energy in Transition 2020: Programme Sessions









#### Selection

#### **Call for applications**

Duration: from 15.06 until 21.09

Entrepreneurs applications window open + inviting nominated companies

#### **Selection Panels**

calls on: from 21.07./17.09./24.09./29.09.

Engagement of specialised investors to nominate and assess entrepreneur applications

#### Selection Reviews

11.09-29.09 (total of 3 hours)

Expert investor reviews deliver benchmarking and selection results.

#### **Kick-off Session**

09.10./ 10:30 AM CET (1 hour session)

An online meeting to map the specific goals for each of the Entrepreneur Members at the start of the Programme

#### Strategies

#### **Investor Insights**

16.10./ 17:00 PM CET (1.5 hours)

Invitation-only Sessions where investors share insights and present themselves and selected portfolio companies.

#### Academy

21-22.10./ 10:30 AM CET (2 hours)

Entrepreneur peers and coaches review the plans of the selected Entrepreneurs leading to recommendations

#### **Invitations Service**

02-03.11/ (2 hours)

Guest Invitations service for contributing Entrepreneurs and Experts, as well as Club Members

#### **Deep Dive**

11-12.11. TBC (2 hours)

Invitation-only Sessions to review and discuss specialised topics hosted by Partners or the Investors Club

#### Meetings

#### **Opening Tour**

12.11./ 10:30 AM CET

Overview of Hosts, Partners, selected Entrepreneurs and engaged Investors & Partners

#### **Pitching**

23-24.11./ 14:00 PM CET (total: 6 hours)

Invitation-only online Sessions with Pitch, Presentation and Speed-dating with Guests.

#### One2Ones

23-24.11./ PM + 25.11 full day (total: 3 hours)

Pre-scheduled & confirmed 15-minute-slots per meeting.

#### Recognition

**World Tour** 

Jan - March 2021 (2 hours)

Winners of Programme are invited to additional online sessions with international investor guests.

#### Wall of Honour

Dec 2020 - Nov 2021 (1 year)

Online visibility and recognition for Hosts, Partners and top rated Entrepreneurs .

If you want to join, reach <u>Aleksandra@techtour.com</u>

Check <u>Tech Tour Energy In Transition Website</u> for any updates



the collaborative network of

entrepreneurs

& investors





## **Tech Tour Investors Club (IVC) members**

An investor-only Community of Venture Capital, Corporate and Government investors facilitating co-investment and funding relationships, run by Tech Tour.

#### **Independent VC Fund Managers**















**Corporate Investors** 







Institutional

& Government



\*ADARA

























































Johnson-Johnson



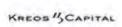
Kubota



logitech



unec























































## **Members Council 2020-2021**



Remy de Tonnac Managing Partner ETF Partners

**Chair** of the Council



Carl Gressum
European Open Innovation
Team Lead
Samsung



Sarah Fisher
Director Global Markets External
Innovation
Johnson & Johnson



Osman Kent Venture Partner Atlantic Bridge



Nico Goulet
Managing Partner
Adara Venture Partners



Petri Laine
Managing partner
Innovestor Ventures



Maurizio Petitbon General Partner Kreos Capital



## **Tech Tour Investors Club Benefits**











Quality **Selection** 

Insightful **Strategies** 

Trusted **Meetings** 

Valuable **Recognition** 

Passionate **Service** 

### Across Regions, Sectors, Tracks & Stages

### Intelligence

on tech companies, investors & partners enhances investments, valuations and returns

### **Insights**

and benchmarks with/ of peer strategies reduce risks and save losses and time

### **Meetings**

with, and intros active (Co-)Investors & Partners builds trust and leads to solid deals and partnerships

#### **Honours**

Earned with peers across the Community across regions builds brand visibility and partnership leads

#### **Service** & Network

Across the eco-system with personalised service, saves time, costs, travel and frustrations and allows fun.

+ Onsite Meetings [when safe]







## **Closing Remarks**





Remy De Tonnac,
General Partner at ETF Partners, Chairman
of Tech Tour Investors Club Council





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