

CLEANTECHFORUM **EUROPE**

Chantilly, near Paris, 5-7 November 2024



Thank you for celebrating the 20th anniversary of Cleantech Forum Europe with us in Chantilly, France, November 5-7, 2024. To mark this milestone, the cleantech ecosystem came together to shape the next 20 years of cleantech innovation. We collectively looked into the future and shared perspectives on how we see cleantech trends and topics developing over the next 20 years.

Cleantech Group laid out two key questions for the cleantech community to tackle over three days:

Defining Forces: What are the pivotal trends and topics of the coming 20 years?

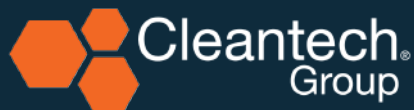
Europe's Potential Competitive Edge: What are the areas that Europe could genuinely build future competitive advantage around?

This flipbook captures the highlights of your insightful discussions and innovative ideas shared at the event—a visual journey of your contributions.

Please enjoy this keepsake from the 20th Cleantech Forum Europe!

Together, we're shaping the future of cleantech. Thank you for being a part of our history and our future.

Cleantech Group



What are the PIVOTAL TRENDS & TOPICS of the coming 20 years?

What areas within CLEANTECH could EUROPE genuinely build FUTURE COMPETITIVE ADVANTAGE around?

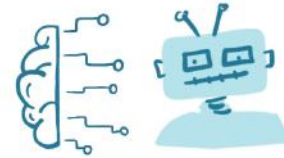


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CROSS CUTTING THEMES of the coming years

AI and CLEANTECH

ANTHONY DEORSEY SIMON BENNETT



AI Speeding the SCALE of DEEP TECH

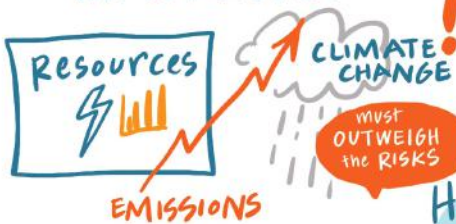
AVALANCHE FUSION = SPEED = ZANSKAR on Geothermal
 model Reactions → Configure Experiments
BIO MATERIALS = Greater INVESTOR CONFIDENCE with AI in TECHNOLOGY
 Closed Loop-MINING → No need to start from ZERO
 NBIT & reduces risks → Patents
RESILIENCE to CLIMATE = SPEED in Product Development
 Crops & Pests → Granular Information → Surge in Patents

more tech NEEDED

White Box aimed at USERS



THE CHALLENGE



Still GROWING and becoming more GLOBAL

still hasn't "CRESTED"

How can AI HELP? Stop the Clock

MULTIDIMENSIONAL
 measure forecasting
 optimisation control + decisions
 across INDUSTRY sectors



IEA Policy DATA

What is the ROLE of AI
 ENERGY AI

TECH + INNOVATION
 How will AI SPEED UP
 will it help learning

DEMAND
 context - compared to other SECTORS e.g. EV

OPTIMISATION
 GRIDS are AGEING
 renewing + connecting
 supply & DEMAND
 less Predictable

PREDICTION of CLIMATE THREATS

EXTRACTION

AI will help with FORECASTING
 OUTAGES + surplus capacity can be controlled

SENSORS

Google Tapestry physics based MODEL

What is the DATA SET that will give CUSTOMERS CONFIDENCE?

DEMAND
 manage PEAK DEMAND → match SUPPLY
 studies ACROSS GEOGRAPHIES

MATERIALS

capacity to study large DATA SETS

BioTECH has huge Potential



bringing Forward times

BATTERIES

new Cathode Materials found

Digital Twins

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CROSS CUTTING THEMES of the coming years

the BLUE ECONOMY

TAGGING EXERCISE

BROAD VARIETY of companies

- # Extract Resources
- # Harvest Life
- # Maintain & Repair
- # Monitor
- # Transport + Commerce

ECOSYSTEM MAPPED

ESO's focus on LOCAL + LEGAL ECONOMIES

Without the OCEAN we are F*****

INVESTMENT thesis MOST IMPORTANT of ALL TIME

30 for 30

the OCEAN is FORGIVING

if we fix the OCEAN we have a chance

7th Largest Economy Policy needed

SHIPPING what if we stopped for a year?



80% of what we wear

people would STARVE

CO₂ emissions

IPCC report

catalyst COP RARR

BIG FOOD is a MAJOR POLLUTANT

PLATFORMS COMMUNITY is Key

32T\$ 80% of Carbon comes from OCEAN Blue Carbon is tipping point

40000 companies tagged



INVESTMENT still needed

some INDUSTRIES have been HIDING

3T\$ economy



keeping PLASTICS out



SEAWEED

More PEOPLE connected with the OCEAN

awareness increasing

COVID

PANAMA CANAL

WILDLIFE + PLASTICS

EVERYTHING is at RISK

SHIPPING

Adaptation NEEDED to enable Scalability

very trad COMPANIES

Food SECURITY ISSUE

UKRAINE WAR raised AWARENESS

SEABED trawling



No more Bottom Scraping

RAS RECIRCULAR AQUACULTURE SYSTEMS



High Seas Treaty to Protect

Investment knowledge NEEDED

DEAL SIZES

SME'S

Assets of SCALE needed

most INVESTMENTS are EARLY STAGE



OCEAN CURRENT

-fuel bill ↓ emissions

FUEL

Route Optimization

Methanol Ammonia finding the FUELS finding the SEAFARERS



Water Security & Management

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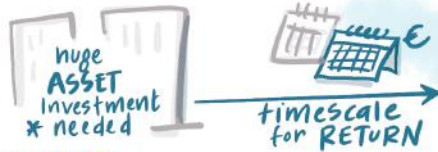
How do we SCALE?

Nicolas Piau



Irene Gálvez

Valleys of DEATH in the INVESTMENT CYCLE



CABIFY 50%
FLEET Electrification
€40m
EIB Venture Debt
30% revenue INCREASE

manufacturing SUNFIRE
€70m venture debt



TOM van Aken AVANTIUM



PEF - new recyclable Material - € premium vs PET but BENEFITS & DEMAND OFFSET

Large Customer INTEREST



VC'S vs INVESTORS

challenges in EXPLAINING in SIMPLE TERMS

a lot of the DEMAND is here in EUROPE



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from BUILDING VENTURES to BUILDING NEW-LOOK INDUSTRIES

Richard Youngman

THE EVER CHANGING CLEANTECH LANDSCAPE



Araceli Fernández IEA



Jules Besnainou
Julia Reinaud



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SECURING EUROPE'S ENERGY FUTURE

Ukraine 2022
Dependence on IMPORTED Natural Gas HIGHLIGHTED

still 28% fossil fuels
US & China higher dependence on fossil fuel

HEAT PUMPS

AI+tech

lithium ion batteries

Resilience + Policy Priority needed
will bring INDEPENDENCE

TRENDS
electricity 20-60% increase
mobility

HEAT networks need to be replaced
Industrial HEAT batteries

GAS MARKET Distorted

€ prices distorted due to UKRAINE

Heatpump

3D printing in FUSION
Advocacy Needed

NUCLEAR fusion
NEW TECH WAVE ENERGY

RRR Workforce + expertise needed

Digital Twin

Geoscientists in DECLINE

Industrial HEAT it's ECONOMICAL

2040 need for FLEXIBILITY will double

2040

the future is ELECTRIC + Renewables

2030

Implement CLIMATE goals



a RESILIENT ROADMAP for 2040

COMPETITIVE ADVANTAGE

smart grids
HUMAN TALENT

EUROPE'S commitment to RENEWABLES

electrolysers (Supply Chains)

strengthen GRID capacity



wind

partnerships
STRONG FOUNDATIONS

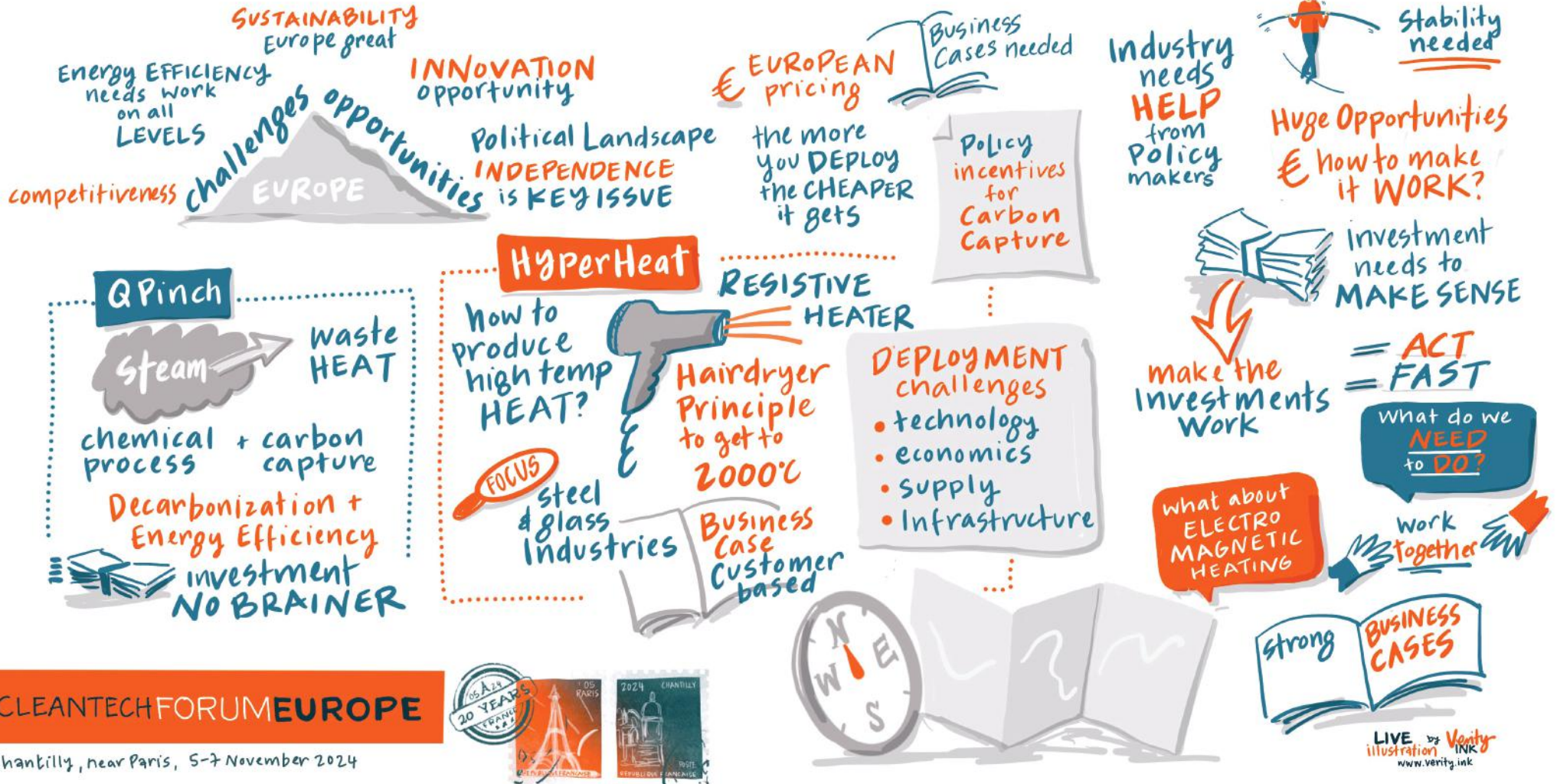
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NAVIGATING the PATH to INDUSTRIAL DECARBONIZATION in EUROPE



BIODIVERSITY and NATURE

Available Data and Measurement

Biodiversity credit complicated
You can't replace a rhino with hens



carbon market OFFSET is simple

we NEED NATURE to survive

venture market vs COMPLIANCE market (much bigger)

if you can't MEASURE it you can't MANAGE it

Dependencies Impact
making BUSINESS CASE with DATA
to inform investment decisions

the NEED for measuring RISKS
REPORTING

How to help PEOPLE understand NATURAL CAPITAL



Report back to INVESTORS

? What to measure and when

Biodiversity + climate change are INTERLINKED

metrics needed

Investors driving COMPANIES to make change

GUIDANCE NEEDED

FINANCE needs to FLOW... (and be correctly) managed

tech CHALLENGE Nature Metrics

lack of KNOWLEDGE along SUPPLY CHAIN
asset sites

once SITES mapped eDNA samples taken and picture built
72 hrs



Who owns the DATA

DATA becoming increasingly RELIABLE

Non Invasive + Very RELIABLE

CAP 16

Pilot Projects

channel Funding

what about the INDIGENOUS VOICE?

it's a CHALLENGE

Tech is ENABLER

top DOWN approach vs bottom UP approach
usually works BETTER

Nature 100 survey around TECH will help drive

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BATTERY MATERIALS - Securing Europe's Future through Innovation



Growth in EV market

CHINA dominates

investment in Manufacturing

increased DEMAND for Critical minerals

Diversification in CHEMISTRY choices

sovereignty - governance

materials ABUNDANT not critical

it's time to SCALE and localize

Supply has been MANAGED

7x growth in solar PV to 2035

VULCAN PROJECT

Plant INAUGURATION

local LITHIUM Production & competitive

2027 commercialization

OEM's believe in LOCAL production

Long term View to Support SUPPLY chain

Refineries not POPULAR in EUROPE

work still needed to SECURE end to end PROCESS value chain

Manufacturing has CHALLENGES

Leapfrogging doesn't WORK

SOLVENTS Some bad but can't avoid

HIGH SPEED manufacturing missing in EUROPE

savings could be made

Refining EUROPEAN FUNDS to SUPPORT project

medium + long term Plans

Recycling is KEY

Accelerate FORMATION

it needs to MAKE SENSE to Customer

CIRCULAR ECONOMY NEEDED

no technology breakthrough needed

use what's THERE it's not complicated

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BUILDING a FOOD RESILIENT FUTURE in EUROPE



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