



Coatema research & development projects

Coatema

05/04/2023

MEMBER OF ATH

Agenda

1. Introduction
2. The vision
3. The next R&D frontier
4. The R&D centre & know how base
5. Current R&D projects
6. Former R&D projects
7. Summary

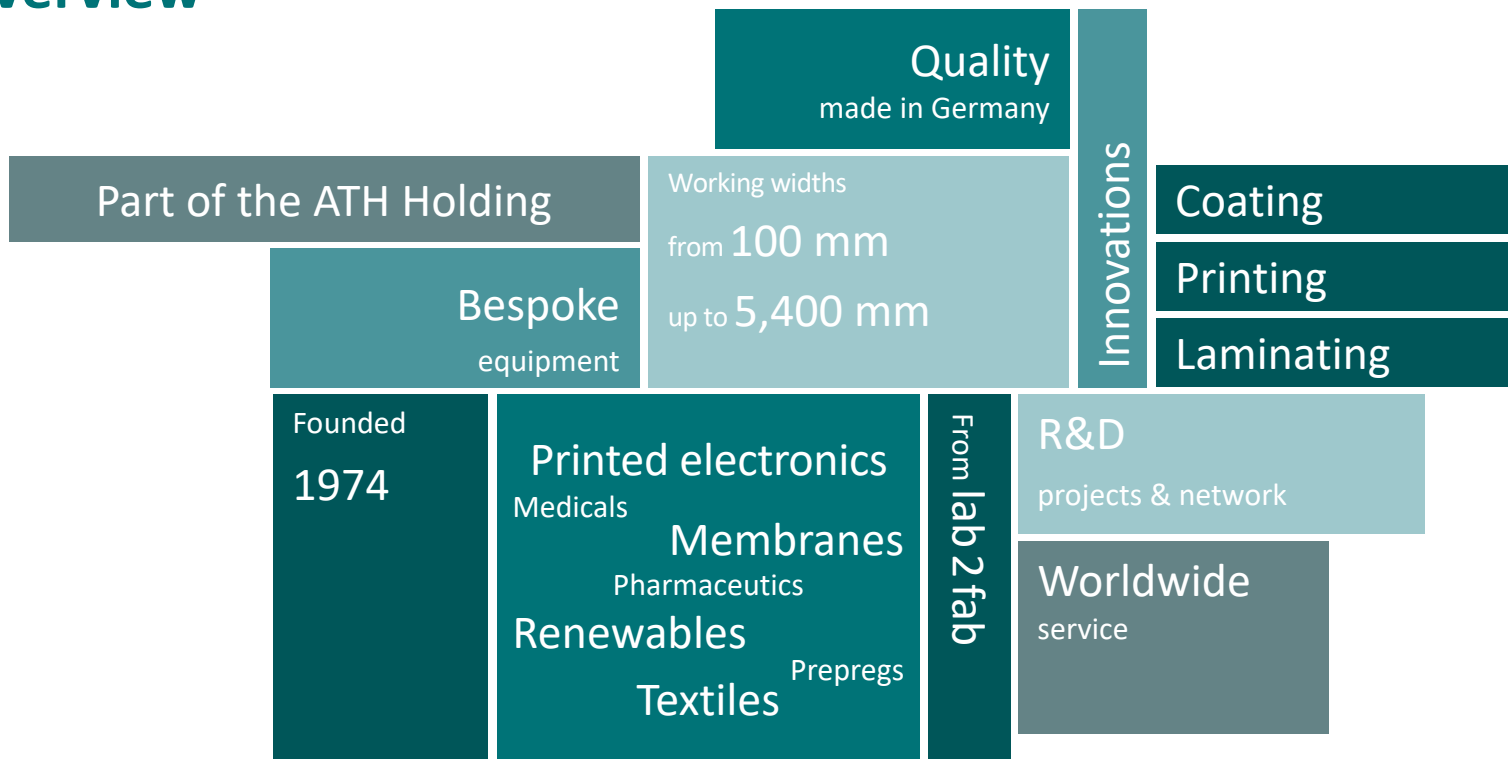


1.

Introduction



Overview



Group of companies

ATH ALTONAER
TECHNOLOGIE
HOLDING



- ✓ Founded 1903
- ✓ Approx. 200 employees
- ✓ Located in Hamburg

DRY/TEC

- ✓ Founded 1995
- ✓ Approx. 50 employees
- ✓ Located in Norderstedt



- ✓ Founded 1974
- ✓ Approx. 50 employees
- ✓ Located in Dormagen

Vision – from lab 2 fab



Lab



Pilot



Production

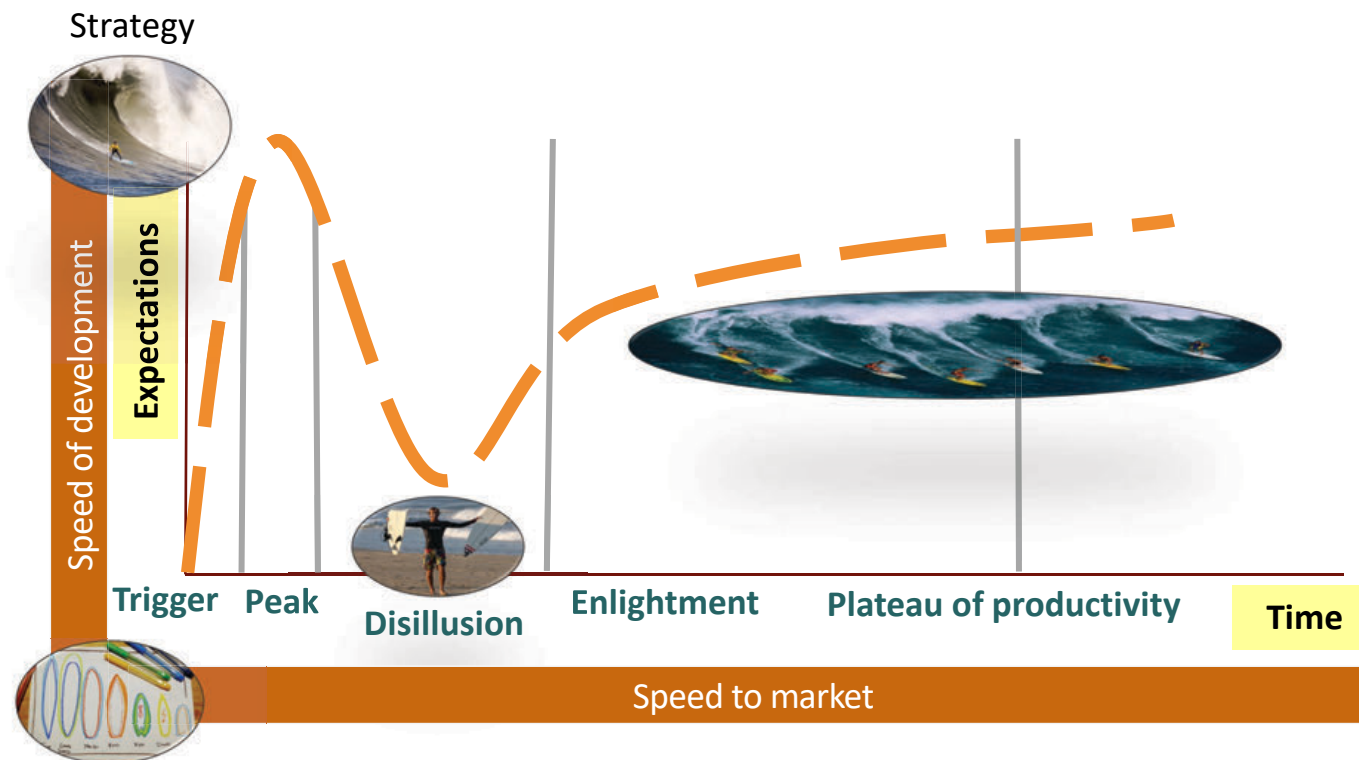
Coatema equipment platform strategy for lab 2 fab

2.

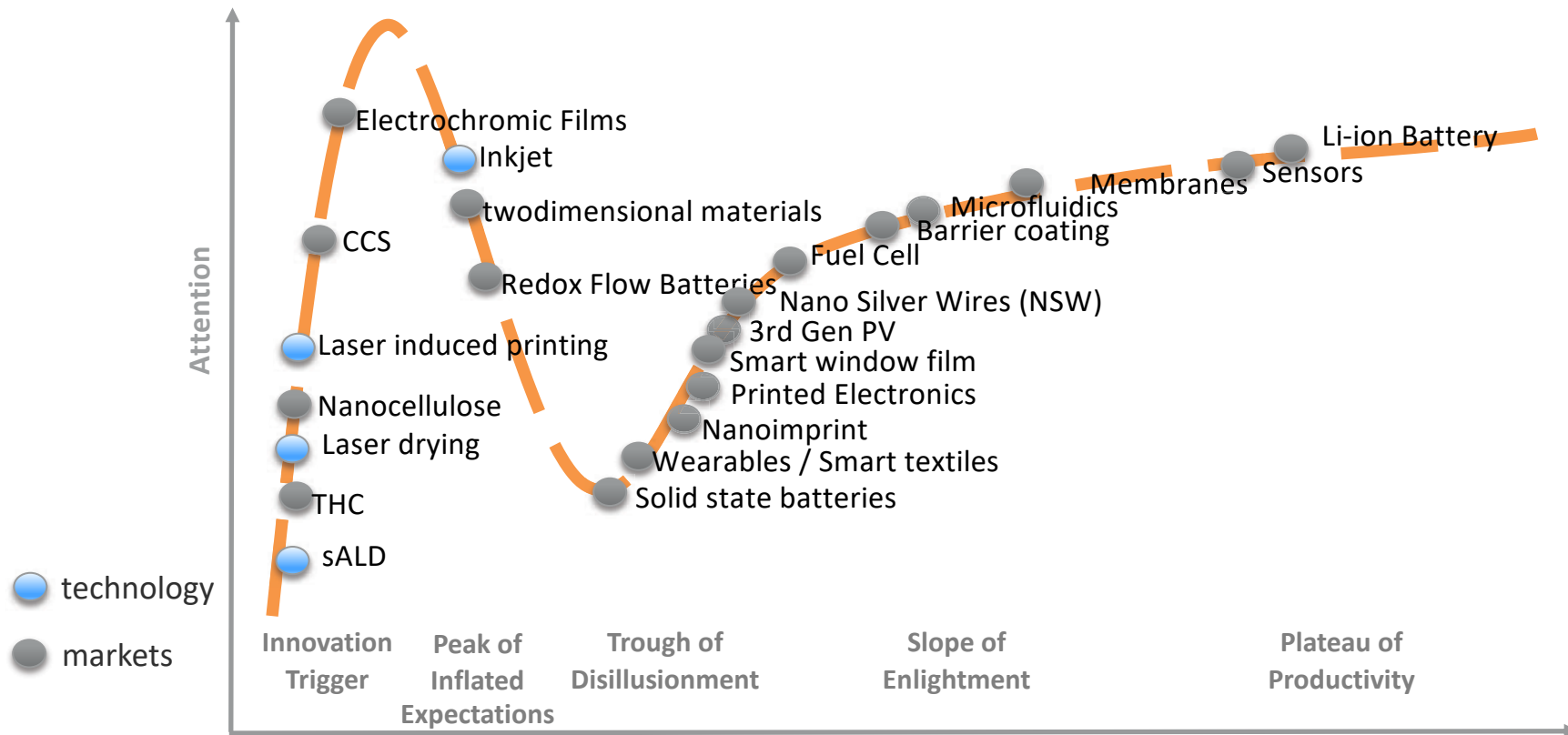
The vision



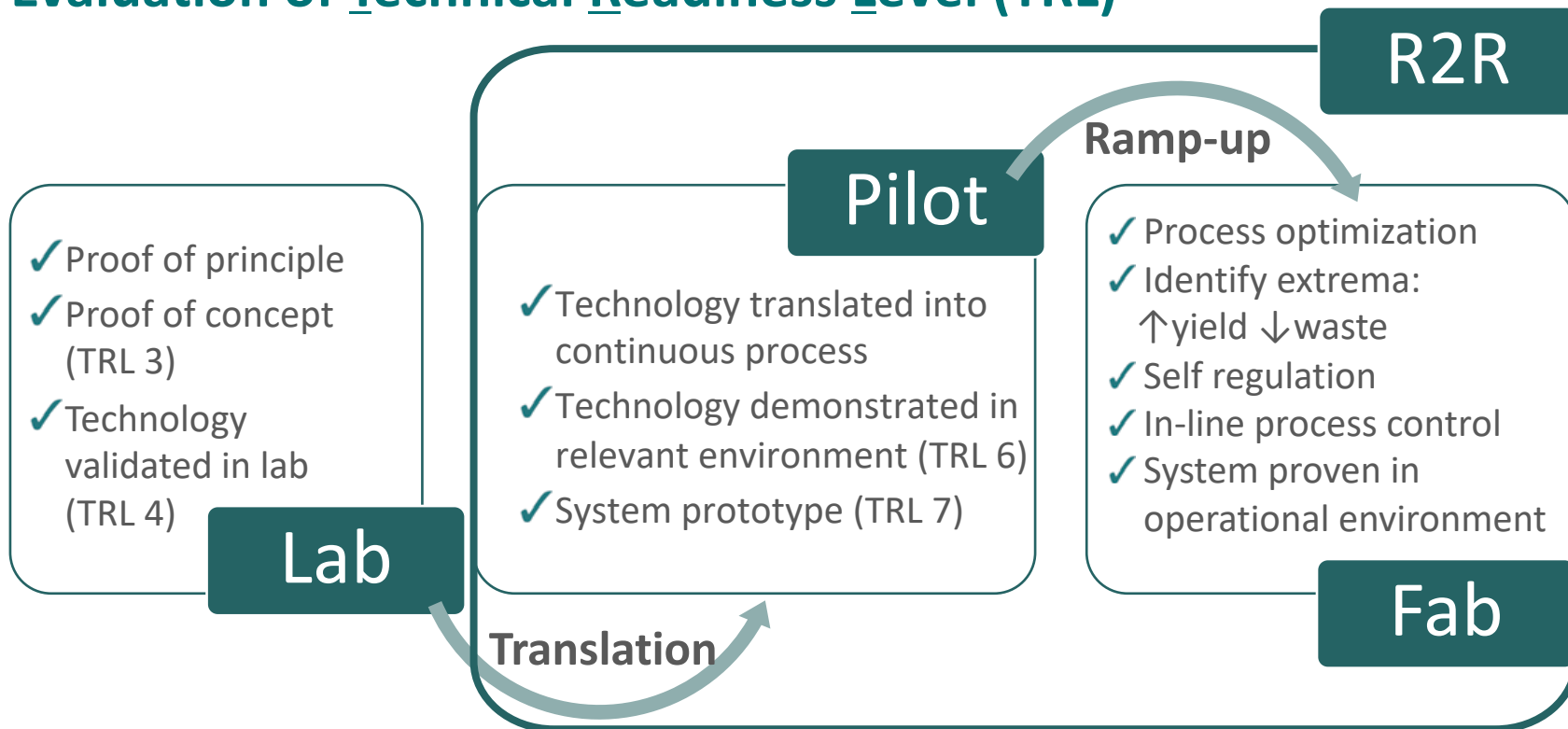
Surf Hype cycle



The vision



Evaluation of Technical Readiness Level (TRL)



Our R&D mission

The exploration part of R&D services

- ✓ Exploration of new technologies which can or could have an impact on Coatema

Demonstration of R&D results

- ✓ Product driven engineering solutions

Development & engineering of novel equipment

- ✓ Optimizing process regimes to eliminate bottle-necks in new or existing technologies

Interdisciplinary Symposia for industry & training

- ✓ Mid-term branding of Coatema

Consultancy & Equipment optimization

- ✓ Cost reduction & added value for endusers

Our USP – strength & expertise

- ✓ Multifunctional team of 10 including researchers, engineers and application experts
- ✓ Successful AiF, BMWiF, BMWi and European projects since 2002
- ✓ Global and strong European Network in different technology areas
- ✓ Interdisciplinary networking for innovative coating, printing and laminating solutions
- ✓ Europes biggest and most versatile R&D centre
- ✓ Engaged in currently more than 10 R&D projects
- ✓ Early market entry & know-how build up for start up companies

Our R&D process – R&D strategy

Step 1

- ✓ Open minded networking with partners (listening & analysis)
- ✓ Identify high value products (product growth rates & margins)
- ✓ Innovative concept for R2R process application (first results)
- ✓ Looking for enduser with intention to start production

Step 2

- ✓ Building of consortium and finalizing ideas
- ✓ Specify funding opportunities
- ✓ Proposal preparation and submission
- ✓ Evaluation & negotiation
- ✓ → Kick-Off-Meeting

R&D services

Process development

- ✓ Feasibility study
- ✓ Ink – process study
- ✓ Process analysis
- ✓ Proof of concept
- ✓ Small scale prototype

Test production

- ✓ Prototyping
- ✓ Near to market testing
- ✓ TRL evaluation
- ✓ Training of staff

Education

- ✓ Coatema conference
- ✓ Training of customers
- ✓ Education of students

After sales service and ramp up of processes

- ✓ of Coatema units

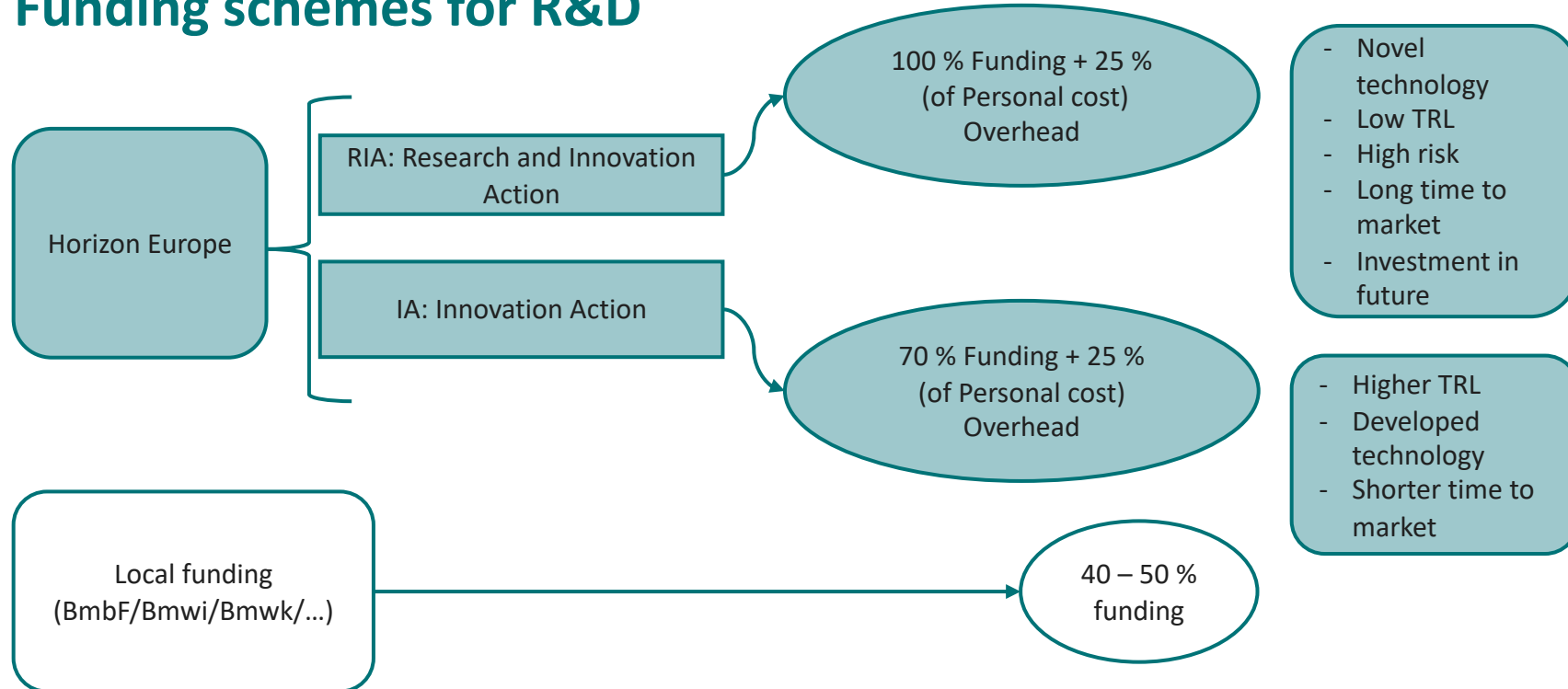
Development of custom made design for equipment

- ✓ Prototyping
- ✓ Proof of concept

Funded research projects

- ✓ German funded
- ✓ Horizon 2020
- ✓ Global 2+2 projects
- ✓ B2B projects

Funding schemes for R&D



Overall generated funding since 2008 more than 15 million Euro!

R&D projects overview 2023

Printed electronics & process control



In-line and real-time digital nano-characterization for flexible organic electronics



Oled Solar

Advanced production for opto electronics towards industry 4.0

Process & equipment for printed electronics

EffiLayers

R2R process optimization of organic photovoltaic cells



Development of near-field electro hydrodynamic nanowire printing

Battery production



Implementation of laser drying processes for lithium ion battery production



R2R process optimization for solid state batteries

Fabric functionalization



Plasmonically enhanced photocatalysis for wastewater treatment

RetroWin

R2R Process and machinery development for retrofit window films for lower production costs

Sustainable production technology



Sustainable paper-based printed electronics and biosensing platform



Creating an open-innovation testbed for sustainable packaging

Highlights of R&D Projects 2021 – 2022

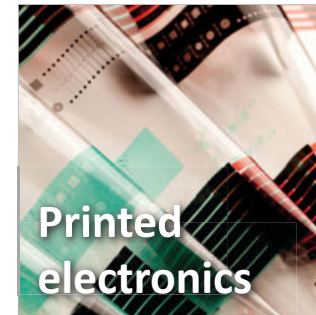
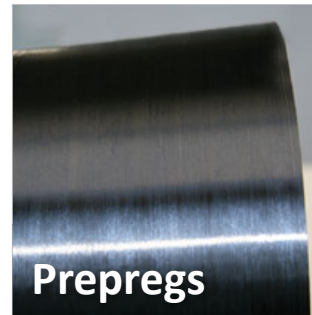
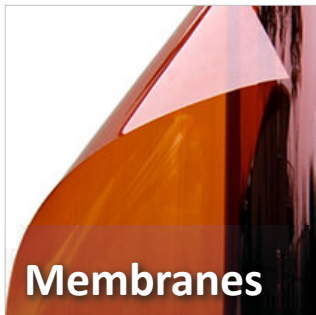
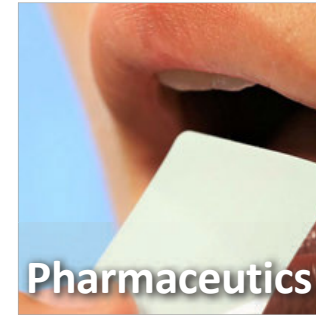
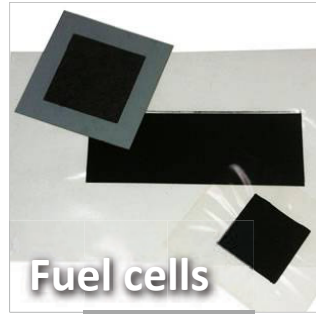
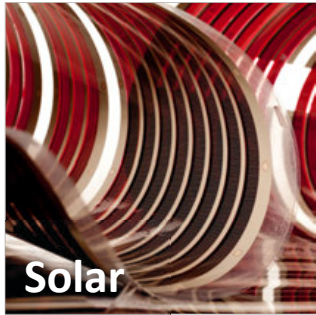


The vision

R&D customers



Our markets

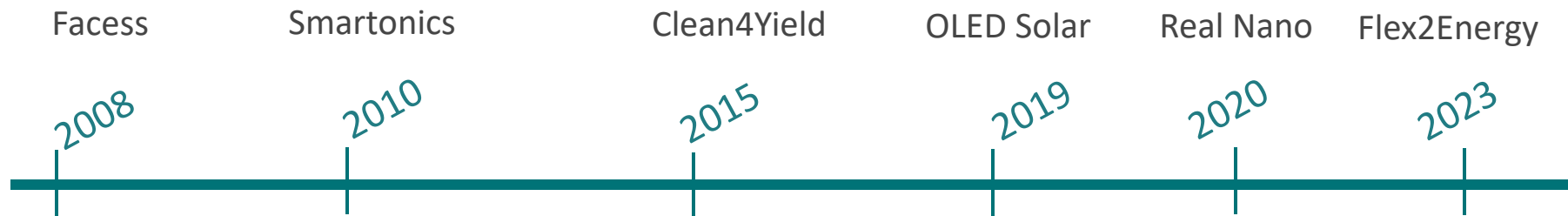


Actual system proven in operational environment



Basic principles observed

Developing 3rd Gen PV at Coatema



✓ 3 BMWF Projects with Ruhr Uni Bochum and ILT: FlexLAS – Photonflex – Effilayers

✓ 1 REGAC project – LS09 Registration improvement on the MAXI Line at VTT

OPV equipment outside of funded projects

G24i, Solarpower, CSEM, VTT-LS09 MAXILINE, UNSW, CSRIO

CSEM, Eight Nineteen, Heliatek

Developed and integrated technologies in 3rd Gen PV

- ✓ Inert pilotcoater design
- ✓ Slot die coating
- ✓ Screen printing, gravure and flexo printing
- ✓ Laser integration
- ✓ Inkjet integration
- ✓ Registration control
- ✓ Inline quality control
- ✓ Inline layer performance control
- ✓ Nanoimprint surface modification

3.

The next R&D frontier



What is Deep Tech?

- ✓ ...companies founded on a scientific discovery or meaningful engineering innovation. (Swati Chaturvedi, 2015)
 - ✓ This is where you're asking, „Aren't all technology companies founded on these principles?" Partly yes, but mostly no. Most technology companies these days are built on business model innovation or offline to online business model transition using existing technology. Take Uber for example – Uber is built on the concept of a „sharing economy" – a business model innovation enabling individuals to share existing resources. <https://www.linkedin.com/pulse/so-what-exactly-deep-technology-swati-chaturvedi/>
- ✓ Deep Tech has been around a very long time- just not called deep tech.
- ✓ Deep Tech can be relative: **important to take societal perspective**
- ✓ Current list of Deep Tech areas often includes:

✓ Advanced manufacturing	✓ Energy
✓ Advanced materials	✓ Food and agriculture
✓ Artificial intelligence	✓ Photonics and electronics
✓ Biotechnology	✓ Quantum computing
✓ Blockchain	✓ Transportation/ mobility

New lab2fab process approach – Characterized by attributes

Time scale: Long

- ✓ Over-the-Horizon time scale, measured in years and decades
- ✓ Scope from basic science to actualized implementation
- ✓ Development cycle often begins in universities or research institutes, prior to formation of start-up or inclusion in larger corporate R&D programs
- ✓ Market adoption can be lengthy

Impact: Large

- ✓ Disruptive to targeted industry – represents a significant change or deviation from traditional approach
- ✓ Broad, across multiple industries and application types
- ✓ Societal: Environmental, societal and governance, plus linking to sustainable development goals is typical

Connectedness: Ecosystem

- ✓ Challenges too complex for „two people in a garage”

Targeted technology?

- ✓ BCG says Yes
- ✓ Plus: design-build-test-learn cycle (DBTL) de-risks plus speeds product development and time to commercialization

New lab2fab process approach – Caveat: Convergence

Technology

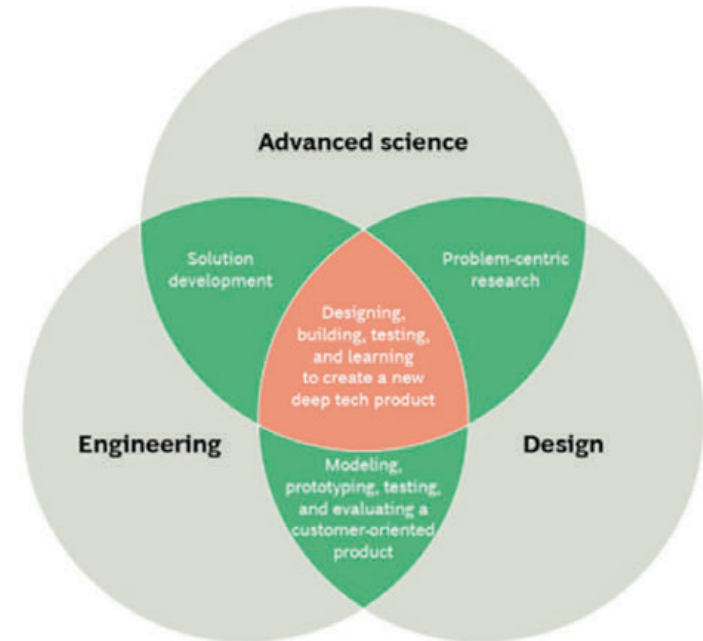
Combining otherwise disparate innovations to uniquely work with each other to enable new advancements

- ✓ Materials & manufacturing
- ✓ Manufacturing & control
- ✓ Control & digital / cloud transformation
- ✓ Cloud transformation & fintech

Markets

Trends and interests aligning to create needs and opportunities

- ✓ Consumer interests & corporate objectives



The vision of Coatema is lab2fab and we are the solution provider for Deep tech companies

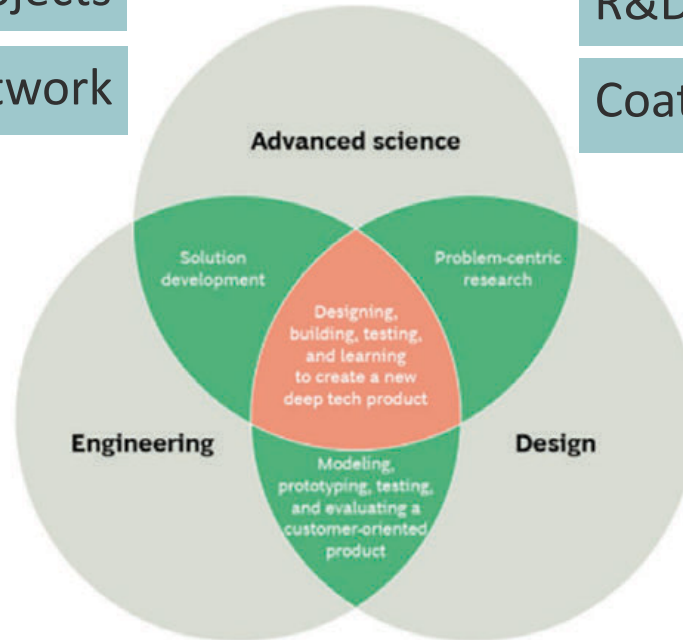
Research projects

Coatema R&D Network

R&D projects team

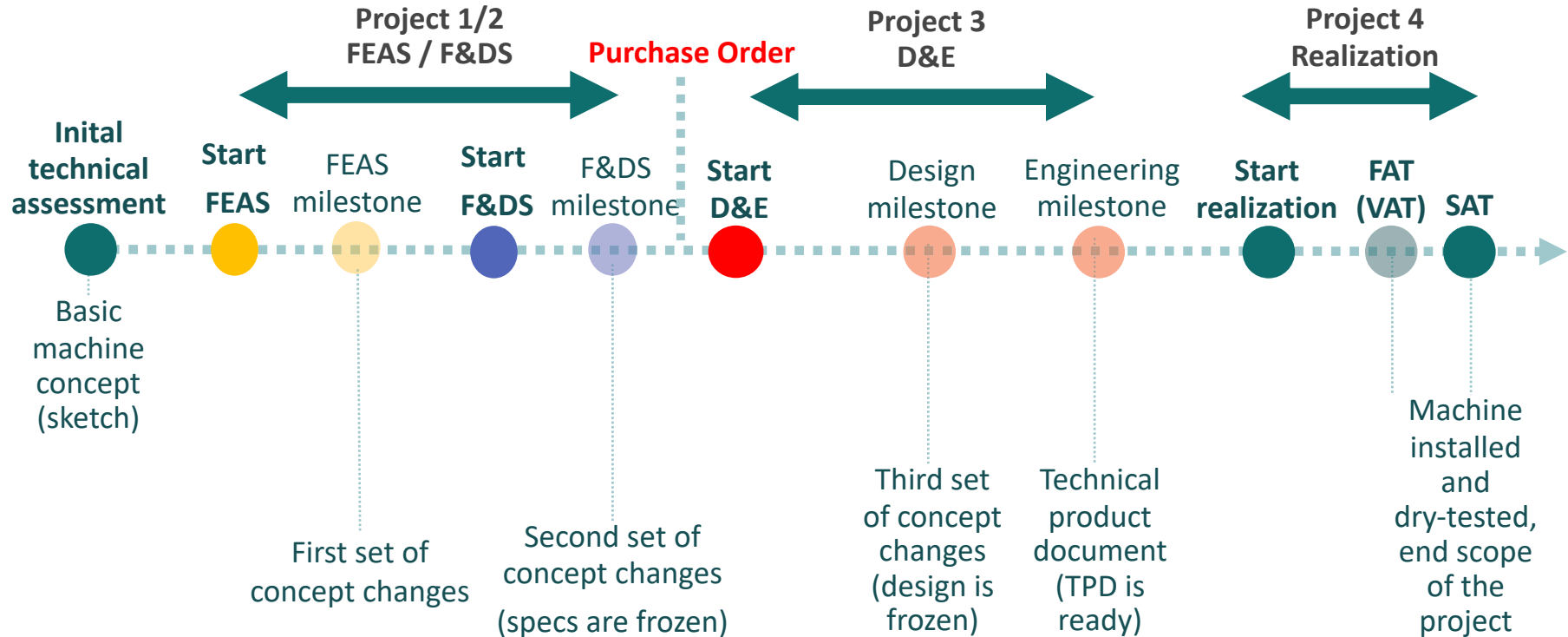
Coatema R&D centre

Teams out of the
design department
& project
engineering



Coatema platform
strategies like
Click&Coat

Overview of integral planning and machine concepts



Process feasibility study – function & design study

Lab scale



A4

Process specification

- Machinery
- Fluid

Defining optim. dilution

50 % → 70 %

- Coating
- Drying
- Curing

Defining optim. layer thickness

3 μm \pm 0,2 μm

Adjustment, testing initiators

→ UV LED 365 nm

50 mm; 1-5 m/min



Defining Pilot-line set up for coating, lamination

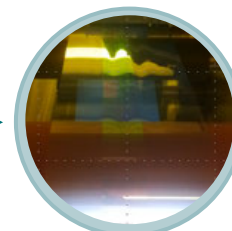
CC08

Transfer to CC08

Trials

- Quality
- Speed
- Curing
- Thickness

Pilot scale



200 mm; 1 m/min

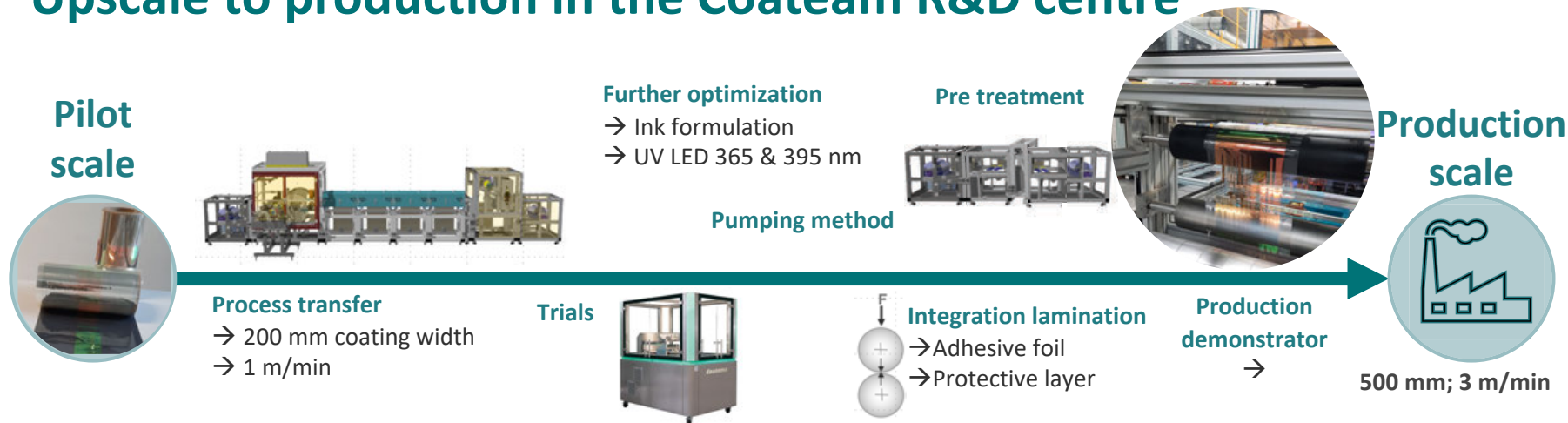
Process & Equipment specifications

- ✓ Suitable R2R coating and lamination solutions at COA will be defined / evaluated

Process & Ink development

- ✓ Testing defined coating/ process parameter at R&D centre COA
- ✓ Ink & Process optimization
- ✓ Defining most suitable R2R process

Upscale to production in the Coateam R&D centre



Process integration

- ✓ Integration into a single R2R process suitable for the production of the OPV modules → Further optimization ink formulation
- ✓ The boundaries of the R2R process regarding quality, speed and costs

Demonstration and evaluation

- ✓ Production final R2R window film & comparison to the initial S2S film
- ✓ Was the transfer from lab- to pilot scale successful?
- ✓ Process equipment
- ✓ Design of a suitable R2R pilot line (500 mm)

4.

The R&D centre & know how base

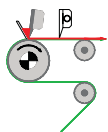


R&D centre equipment

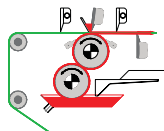




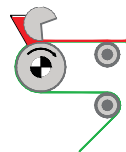
Coating systems



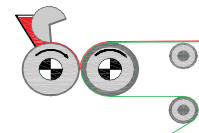
Knife system



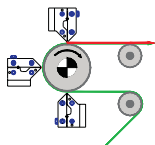
Double side coating system



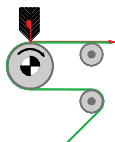
Commabar system



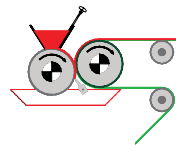
Reverse commabar system



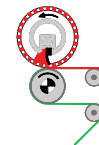
Slot die system



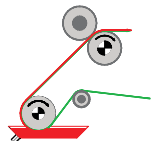
Curtain coating system



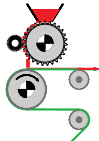
Case knife system



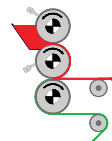
Rotary screen system



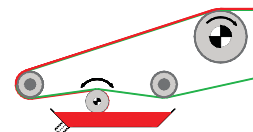
Dipping system (Foulard)



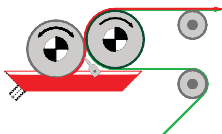
Powder scattering system



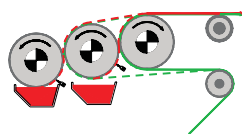
Reverse roll coating system



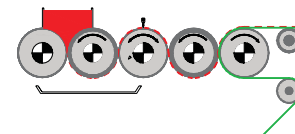
Micro roller coating system



2-roller coating system

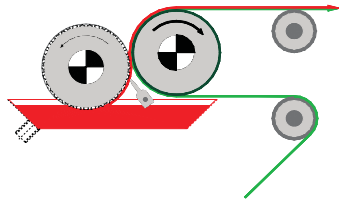


3-roller combi coating system

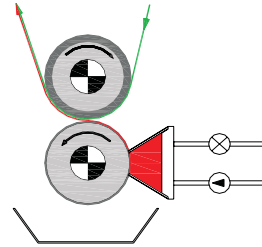


5-roller coating system

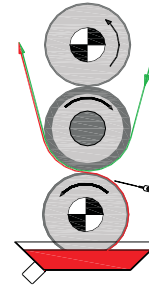
Printing systems



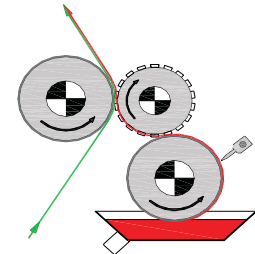
Engraved roller system



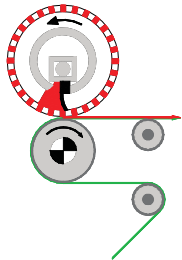
Gravure roller system



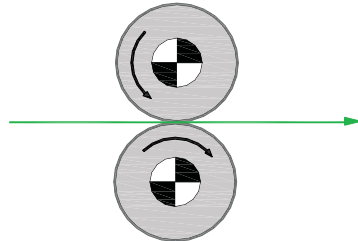
Gravure indirect system



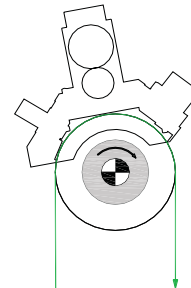
Flexography system



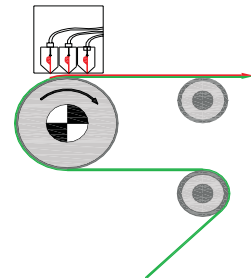
Rotary screen system



Hot embossing system



Nanoimprint system



Inkjet system

The R&D centre & know how base

Overview of technical presentations



Our work in associations – global networking

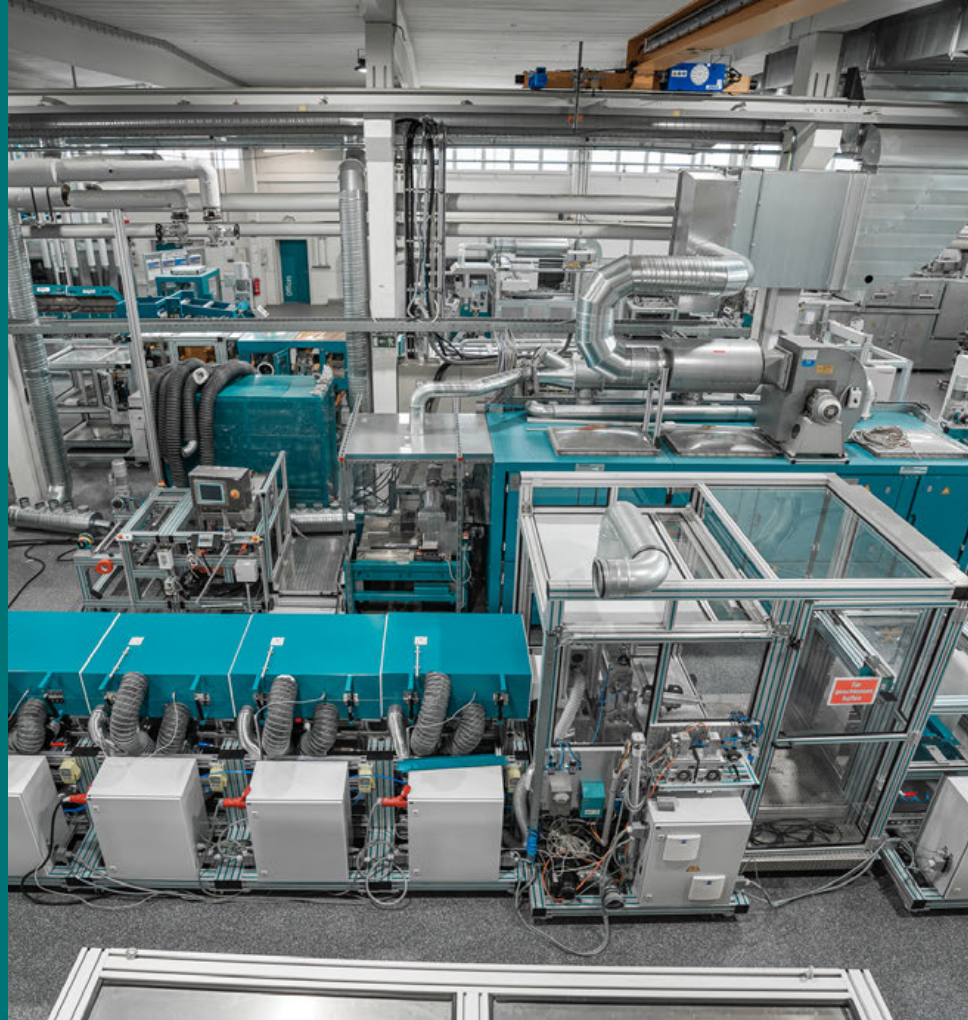


Board Member:
OE-A

Advisory Board:
Fraunhofer ITA

5.

Current R&D projects



Battery & Fuel cell

IDEEL

✓ 08/2021 – 07/2024 ✓ 3.62 M€

- ✓ 8 national partners
- ✓ Implementation of laser drying processes for lithium ion battery production
- ✓ Continuous and intermittent slot-die coating
- ✓ Benchmarking and upscaling of the drying process

NOUVEAU: Safe- and sustainable-by-design metallic coatings and engineered surfaces

✓ 09/2022 – 08/2025 ✓ 3,88 M€ total budget

- ✓ 9 European partners
- ✓ Development of sustainable solid oxide cells (SOCs)
- ✓ Lanthanum and platinum metal group free electrode materials
- ✓ Solid electrolyte and interconnects with a reduced amount of rare earth materials and chromium



**Funded by
the European Union**

Battery & Fuel cell

SOLiD-EU:

Manufacturing technology development for solid-state batteries (SSB, Gen. 4a-4b)

- ✓ 09/2022 – 08/26
- ✓ 7 M€ total budget
- ✓ 15 European partners
- ✓ Cost efficient manufacturing
- ✓ Pilot scale dry extrusion coating process for the NMC cathode + BSPE polymer
- ✓ Scalable thin film deposition methods for the Li anode and the interlayers
- ✓ Pilot scale slot die coating process for the solid



**Funded by
the European Union**

Process and equipment for printed electronics

EffiLayers: R2R process optimization of organic photovoltaic cells

✓ 09/2019 – 02/2023 ✓ 1.5 M€ total budget

✓ 4 German partners

✓ Follow on project of Flexlas & PhotonFlex

✓ Flexible organic solarcells (OPVs)

✓ Process development

✓ Laser drying and patterning

✓ Equipment engineering

TiKaBe HyFAB:

INK DEVELOPMENT FOR FUEL CELL CATALYST COATING - A HYFAB PROJECT (TIKABE)

✓ 06/2022 – 07/2024 • 76 K€ total budget

✓ 5 European partners

✓ Development of catalyst inks with optimized rheological properties for different printing coating processes (inkjet, slot-die, gravure, flexo, screen,...)



(Opto-)electronic devices

Flex-G 4.0: Research into technologies for the manufacture of translucent and transparent roof and facade elements with integrated optoelectronic components.

✓ 08/2022 – 07/2026 ✓ 3.7 M€ total budget

✓ 14 national partners

✓ Process transfer & upscaling

✓ Pilot-scale manufacturing process for EC films with a process yield of 85%

✓ Demonstration of EC films in public building (schools)



Bundesministerium
für Wirtschaft
und Energie

Nano-imprint

PEPcat: Plasmonically enhanced photocatalysis for wastewater treatment

06/2019 – 03/2023

3.0 Mio € total budget

- ✓ 5 German partners
- ✓ Novel advanced oxidation process with reduced energy consumption for wastewater treatment
- ✓ Scale-up photocatalytic nanostructures for industrial production
- ✓ Enhancing machinery accuracy to single digit micrometer range
- ✓ www.pepcat.de



Sustainable production technology

RealNano: In-line and real-time digital nano-characterization for flexible organic electronics

✓ 03/2020 – 02/2023 ✓ 4.9 M€ total budget

✓ 9 European partners

✓ Development of rapid characterization methodologies and integration in pilot-to-production lines

✓ Digital Intelligence to manufacturing

✓ <http://www.realnano-project.eu/>



Funded by
the European Union

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862442

FF2S: Creation of an open innovation test bed for future-oriented and sustainable production technology

✓ 04/2020 – 04/2024 ✓ 16 M€ total budget

✓ 21 European partners

✓ Validate and demonstrate the outstanding performance of novel nano-functionalized plastic, paper and membrane surfaces

✓ Upgrade existing „lab-to-fab” facilities and connect them to a unique OITB (TRL4 → TRL7)

✓ <https://flexfunction2sustain.eu/>



Funded by
the European Union

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862156

Sustainable production technology

Waterproof: Deploying industrial-urban symbiosis solutions for the utilization of energy, water, industrial waste and by-products at regional scale

✓ 06/22 – 05/26

✓ 9.2 M€ total budget

✓ 12 European partners

✓ Convert CO2 emissions from waste(water) processing into green consumer products

✓ Electrochemical conversion of CO2 into formic acid used for end products

Flex2Energy:

Advanced manufacturing of Integrated PV

✓ 01/2023

✓ folgt € total budget

✓ 17 European partners

✓ Boost Integrated Photovoltaics manufacturing and the reliability

✓ Integration of external hardware of partners (BST, SEMILAB, LAYTEC, ...) in Click&Coat™ based system

✓ Automation, machine learning & AI

✓ Implement Industry 4.0 concepts



**Funded by
the European Union**



**Funded by
the European Union**

6.

Former R&D projects



Printed electronics & process control

Scale-Up of Printed Electronics Raw materials on of flexible organic solar cells

✓ 01/2018 – 12/2020 ✓ 5.0 M€ total budget

✓ 7 EU partners

✓ Products and services for circular economy

✓ Scale-up key materials for organic and printed electronics

✓ Enhance EU competitiveness in organic and flexible electronics

✓ <https://supersmart-project.eu/>



SUPERSMART

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 696076.



Advanced production for opto-electronics Towards industry 4.0

✓ 09/2018 – 08/2021 ✓ 7.8 M€ total budget

✓ 18 European partners

✓ Inline measurement and registration for OLED and Solar processes on R2R

✓ In the stage of project planning and clarification of needs

✓ <https://oledsolarproject.eu/>



Oled Solar



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 820789.

Printed electronics & fabric functionalization

Sustainable paper-based printed electronics and biosensing platform

- ✓ 01/2018 – 12/2021
- ✓ 8.0 M€ total budget
- ✓ 11 EU partners + 2 non EU
- ✓ Printed electronics on paper
- ✓ Nano cellulose instead of „normal“ paper
- ✓ Sensors for „drug-of-abuse“ analysis
- ✓ Recyclable, ultra-low power consumption, low cost, environmental friendly biosensing platform
- ✓ <https://www.greensense-project.eu>



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 761000.

R2R technology for producing ECD with tunable g-values

- ✓ 06/2017 – 05/2020
- ✓ 2.4 M€ total budget
- ✓ 11 German partners
- ✓ Follow up on EELICON
- ✓ R2R production of ECD on EFTE
- ✓ R2R production of OPV
- ✓ Improved lamination
- ✓ ECD for membrane roofs



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für Wirtschaft
und Energie

FKZ: 03ET1470D

Electrochemical related projects

Innovative solid state batteries with Sol-Gel,
Li anodes and 3D structuring

10/2017 – 09/2020

2.1 Mio.€ total budget

- ✓ 6 German partners
- ✓ Innovative cell concepts
- ✓ All solid state batteries
- ✓ Lithium metal anode
- ✓ Sol-Gel cathode and current collectors
- ✓ Upscaling of lab processes

Electroluminescent textiles for interior and
exterior decorative and advertising applications

✓ 10/2018 – 09/2020

✓ 1.6 M€ total budget

- ✓ 2 Belgian, 4 German partners
- ✓ Illuminating wallpaper
- ✓ Process upscaling for production of EL textiles



Bundesministerium
für Bildung
und Forschung

FKZ: 03XP0129C

EI-FIB
ELECTROLUMINESCENCE
for FLAGS, INTERIOR and
BANNERS



Supported by:



Federal Ministry
for Economic Affairs
and Energy

(Opto-)electronic devices

Bringing flexible organic electronics to Pilot innovation scale

- ✓ 01/2016 – 12/2018
- ✓ 14.0 M€ total budget
- ✓ 14 EU partners
- ✓ Flexible organic light-emitting diodes (OLEDs)
- ✓ Open access Pilot line
- ✓ Intermittent coating with low viscous inks
- ✓ www.pi-scale.eu

Development of slotdie equipment for perovskite solar cells

- ✓ 07/2017 – 06/2019
- ✓ 0.8 M€ total budget
- ✓ 3 EU partners
- ✓ Ultra fast intermittent coating
- ✓ Piezo based technology
- ✓ Perovskite photovoltaics devices
- ✓ Improved material usage & yield
- ✓ <http://rocket-innovations.eu/laufende-innovationsprojekte/i07-icoat/>



PHOTONICS PUBLIC PRIVATE PARTNERSHIP

GA No. 688093



Rocket-I-007



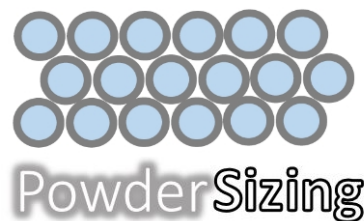
From 2D materials and 3D coating on fibre materials

Synthesis, properties & application of 2D-materials

- ✓ 04/2016 – 03/2019
- ✓ 2.1 M€ total budget
- ✓ 6 German partners
- ✓ Synthesis of 2-D Materials such as Graphene and MoS₂
- ✓ Trials & design study for deposition & transfer
- ✓ R2R and R2P processes

Process chain of powder-coated glass-fiber reinforced compounds

- ✓ 12/2016 – 11/2019
- ✓ 0.8 M€ total budget
- ✓ 2 German partners
- ✓ Homogeneous organic composites
- ✓ Fully coated fibers
- ✓ Less production steps
- ✓ Electrostatic rollers



Bundesministerium
für Wirtschaft
und Energie

FKZ: ZF4099702BL6
FKZ: TF4018750BL6c

Solar cells

Production of flexible organic solar cells

✓ 06/2016 – 06/2019 ✓ 1.3 M€ total budget

✓ 5 German partners

✓ Follow on project of Flexlas

✓ Flexible organic solarcells (OPVs)

✓ Process development

✓ Laser drying and patterning

✓ Equipment engineering

Multipurpose Sol-Gel films for Photovoltaic

✓ 04/2017 – 3/2020 ✓ 2.0 M€ total budget

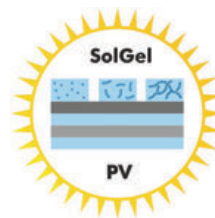
✓ 6 German partners

✓ Sol-Gel materials as adhesive

✓ Sol-Gel as passivation layer

✓ Sol-Gel materials as Mie resonator

✓ Upscaling of nanoimprint



(Opto-)electronic devices

Enhanced Energy Efficiency and Comfort by Smart Light Transmittance Control

✓ 01/2014 – 06/2017

✓ 13 EU partners

✓ Follow-up project of Innoshade

✓ Lightweight electrochromic devices

✓ Click&Coat technology

✓ Scaling & automation

✓ Demonstration of pilot line production

✓ Market entry

✓ <https://www.eelicon.eu/>



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 604204.

Development of machines, tools and processes for OE nanomaterials

✓ 01/2013 – 12/2016

✓ 7.9 M€ total budget

✓ 17 EU partners

✓ Smart nanomaterials & technologies

✓ Pilot line

✓ Upscaling of R2R process

✓ Production of OE devices

✓ www.smartonics.eu



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 310229.

Electronic devices

Innovative Switchable Shading Appliances based on Nanomaterials and Hybrid Electrochromic Device Configurations

✓ 09/2008 – 08/2012 ✓ 10 M€ total budget

✓ 19 EU partners

✓ Large scale, cost effective and light weight, high trough put

✓ In-situ-polymerization

✓ Prototype & demonstrator

✓ Concept & start of Pilot line



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 200431.

High-speed laser process for the production of fully integrated flexible solar cells

✓ 08/2011 – 10/2014

✓ 5 partners (Ziel2.NRW)

✓ Optics

✓ OPV development

✓ Laser patterning, structuring welding

✓ Demonstration



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Investing in our Future
European Regional
Development Fund

Organic electronics & thin film batteries

Contamination and Defect Control for Increased Yield for Large Scale R2R Production of OPV and OLE

✓ 05/2012 – 04/2015

✓ 10 M€ total budget

✓ 17 EU partners

✓ Detection & inspection

✓ Cleaning

✓ Repair

✓ Integration

✓ Best practice procedures

ProLiBat – Design of a continuous fabrication structure for the production of Li-Ion-Batteries

✓ 08/2011 – 02/2014

✓ 7 partners

✓ Pilot line for Li-Batteries

✓ Concept for standardization

✓ Production specifications

✓ Study for production

✓ Process for batteries



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 281027.

ProLiBat

Ziel2.NRW
Regionale Wettbewerbsfähigkeit und Beschäftigung



EUROPEAN UNION
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European Regional
Development Fund

Novel applications

ML2 – MultiLayer MicroLab

✓ 09/2012 – 08/2016

✓ 12 EU partners

✓ Click&Coat™ Technology

✓ Imprint Technology

✓ Transfer Processes e.g. vacuum to wet R2R

✓ R2R-manufacturing platform

✓ Micro-Nano-Bio-Systems

✓ www.ml2.eu



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 318088.

Innovation for Digital Fabrication

✓ 03/2012 – 02/2014

✓ 21 EU partners

✓ Networking Project

✓ Roadmap for Digital Fabrication

✓ Status & evaluation of digital 3D-Manufacturing, e.g. organic Electronic



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 290557.

Novel combinations

Large scale manufacturing technology for high-performance lightweight 3D-multifunctional composites

✓ 04/2011 – 03/2015

✓ 18 EU partners

✓ Automotive application

✓ 3D-textile & novel efficient production

✓ Complete manufacturing chain

✓ Demonstration of Prototype

✓ Reduced process time & cost

✓ Qualification of principle

✓ www.3d-lighttrans.com

**3D LIGHT
TRANS**



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 263223.

Fabric Structures for Solar power generation

✓ 11/2011 – 04/2014

✓ 8 EU partners

✓ Tensile Membrane material that incorporates PV modules

✓ Qualification of principle

✓ Demonstration of Prototype, e.g. off-Grid local power

fabrigen



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 286605.

Inline monitoring & thin film characterisation

Thin Film Measurements on organic photovoltaics layers

- ✓ 11/2012 – 10/2014
- ✓ 1.5 M€ total budget
- ✓ 8 EU partners
- ✓ Integration of in situ-metrology in manufacturing line at Coatema
- ✓ Hyperspectral Imaging
- ✓ Spectroscopic ellipsometry
- ✓ Demonstration of prototype
- ✓ Qualification of principle



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 315665.



Registration Accuracy, High accuracy Registration control for roll2roll manufactured printed electronic

- ✓ 11/2013 – 10/2014
- ✓ AIF-Project
- ✓ 3 EU partner + 1 partner from Japan
- ✓ Integration of novel Printing Units in Production Line
- ✓ High registration accuracy
- ✓ Control software
- ✓ CCD-camera
- ✓ Demonstration of prototype



FKZ: KU3190401RR3

Inline analysis

Inline evaluation of transparent foil coating

- ✓ 03/2015 – 08/2017
- ✓ 125.000 € total budget
- ✓ 2 German partners
- ✓ Detection of organic dyes
- ✓ Small amounts of dye
- ✓ Quartz light guiding
- ✓ Stimulation via UV-LED
- ✓ Detection with photodiode

And many
more...

Fluorescence detection



FKZ: KA3190402ZG4

7.

Summary



Coatema is...

- ✓ A valuable partner for novel R2R-processes
- ✓ An expert in transferring processes to pilot and production lines
- ✓ Innovation leader in novel equipment
- ✓ Coordinator or partner in funded projects since 2002
- ✓ Member of the ATH Holding, a group of technology leading companies in coating, printing and laminating

Do not hesitate to contact us!



Anything missing?

Let us know and we will make it happen!

Our R&D centre is worldwide the most versatile centre for coating, printing and laminating.

Sales department:
sales@coatema.de



Coatema

Thank you

Roseller Straße 4 ▪ 41539 Dormagen ▪ Germany
T +49 21 33 97 84 - 0 ▪ info@coatema.de

www.coatema.com

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