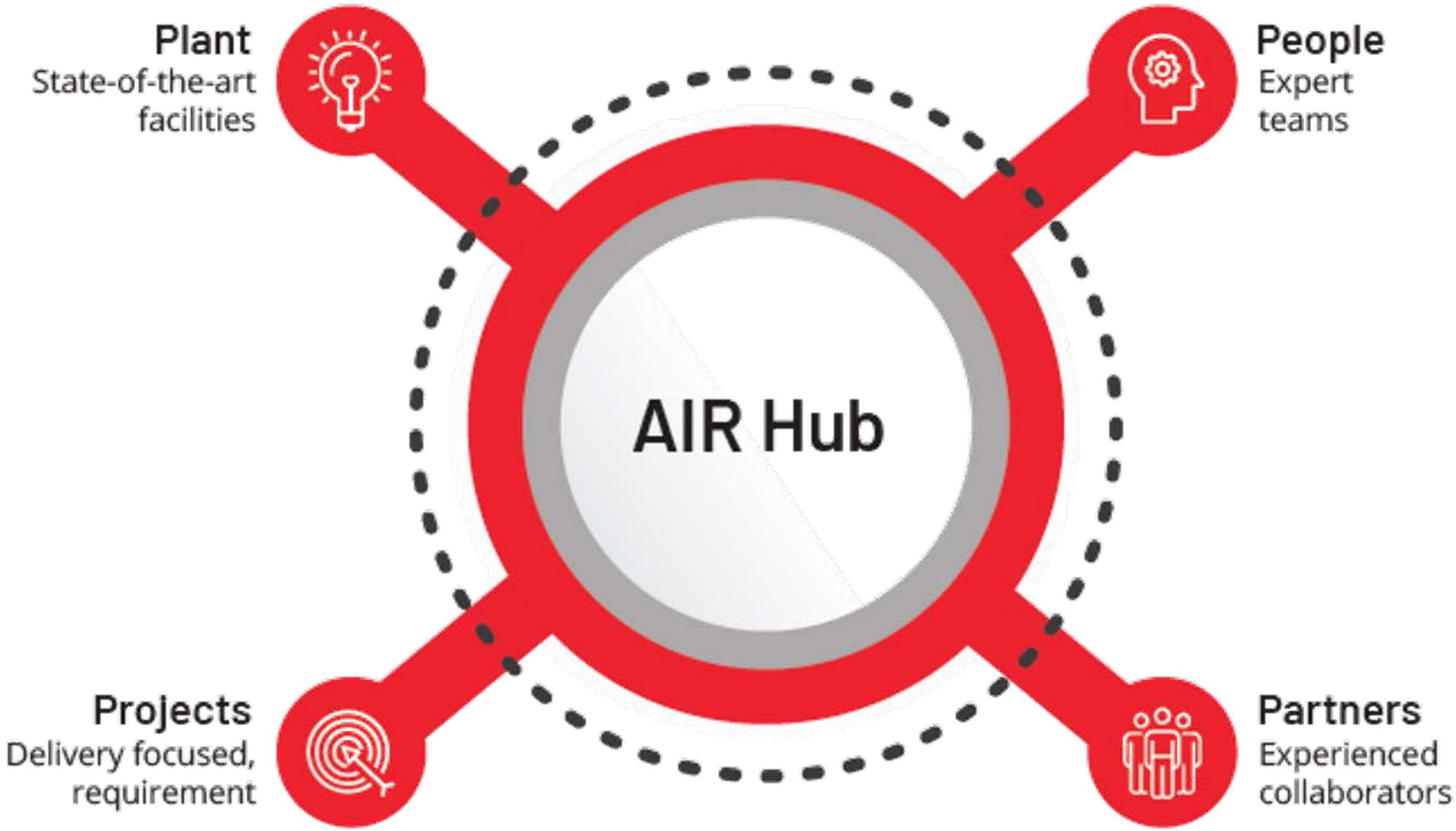
ICAS Emerging Tech Forum

OEM and Supply Chain enablers and blockers in Australia

Dr Adriano Di Pietro, Director – Aerostructures Innovation Research Hub
Kyoto, Japan

SWINBURNE UNIVERSITY OF TECHNOLOGY | AIR Hub

We exist for industry




SWOOPAERO


FIRE RESCUE
VICTORIA


NAUTILUS
aviation

AIR Hub key achievements

40
Industry partners

30
Swinburne staff

20
Students

10
Industry projects

7
International partners

6
New testing systems

5
AIR Passes

2
Technology launches

ADVANCED AIR MOBILITY IN VICTORIA

Economic growth through efficient zero-emission transport and supply chain networks

Social Outcomes

- Regional /Urban connectivity
- Reduced travel times
- Reduced emissions
- Improved emergency management
- Improved health care
- Promote equity, diversity and inclusion

Attributes

- Community needs and expectations
- Transport and logistics integration
- Local jobs
- Partnership arrangements
- New technologies
- Testing and trialling
- Regulatory innovation
- New infrastructure
- National interests

Guiding Principles

- Sustainability
- Community first
- Cross-sector innovation
- Regional development
- Local industry development
- Trust and collaboration
- Open platform

Economic Outcomes

- Boost skills
- Jobs creation
- Supply chain resilience
- Efficient and cost-effective
- Increased productivity

Building a new industry

Our AAM Partners

Across the supply chain

Digitalisation

Blockers

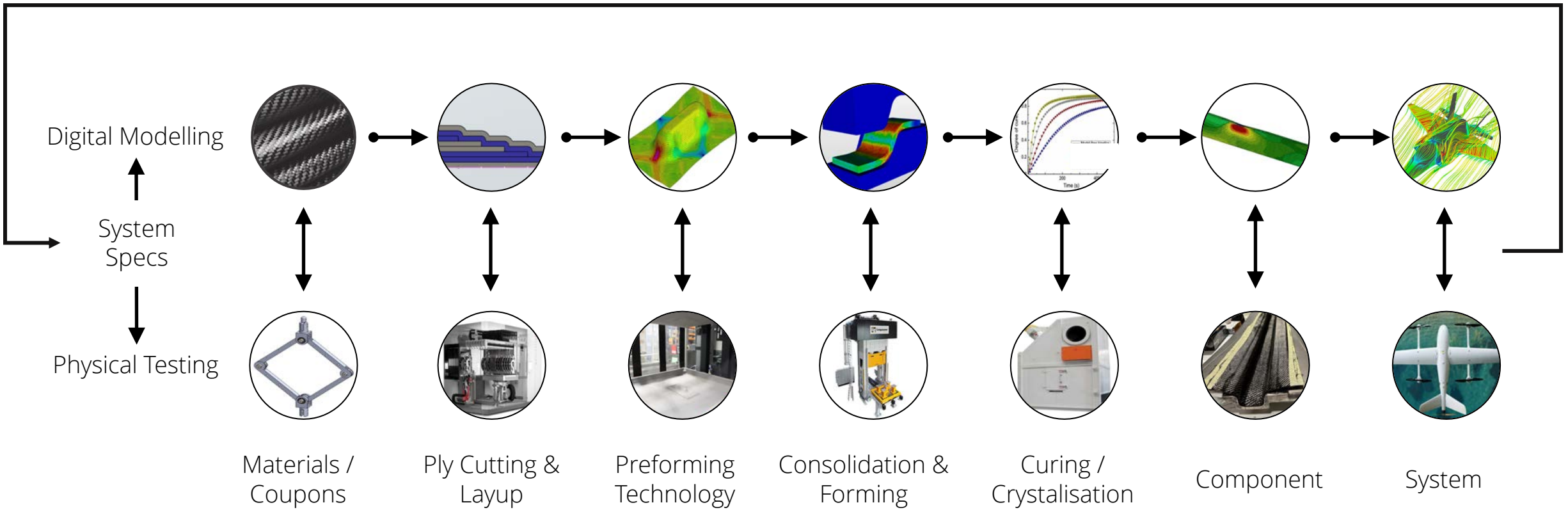
- Lack of available datasets / models
- Integrated design environments, more hype than practice
- Lack of digital fluency in supply chain engineering teams
- Lack of design design talent and resources
- Lack of clear supply chain design environment requirements cascade - suppliers are still working on dead datasets
- Trust and security - cyber risk on supplier systems as well as sustaining internal dev teams

Enablers

- AI adoption – bots, APIs,
- Rapid and readily available Industry 4.0 data acquisition
- Competitive software environment driving distruption – Cloud based design
- Testlab environments
- Super-computing facilities coming online, such as Ozstar
- Digital micro-credential courses
- Security accreditation and tools, eg Blockchain

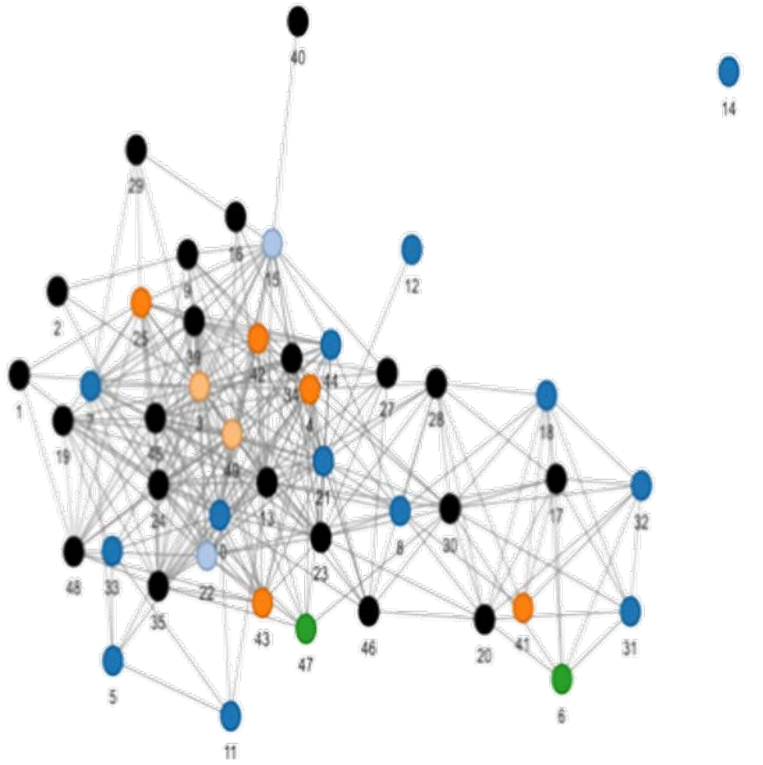
The Digital Building Block

Linking the digital chain

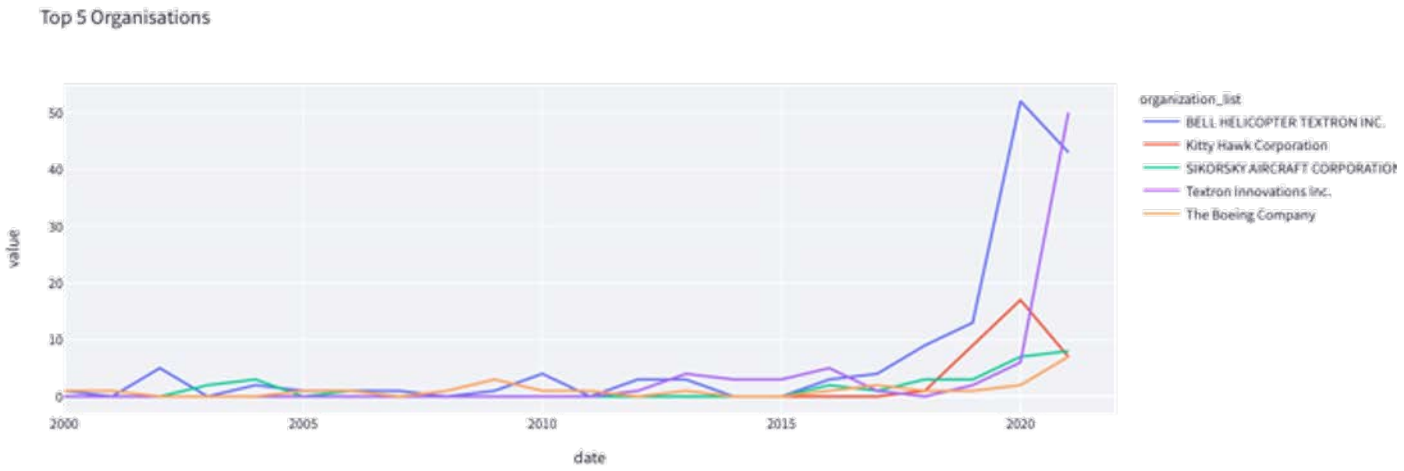


AI Augmented Search

We are using ML and NLP to undertake tech landscaping and identify the edge of innovation



Vector mapping → the edge of innovation



Trending analysis for technology road mapping

Dr. Stephen Petrie, Assoc Prof Alfons Palangkaraya, Dr Adriano Di Pietro, Peter Smith, Swinburne University, AIR Hub

Materials & Manufacturing

Blockers

- Lack of competence in aerospace material qualification
- Suppliers cannot prototype with high volume processes
- Aerospace performance expectations – automotive volumes and price expectations
- New material introduction and qualification time and cost
- Unclear regulatory situation and standards stalling investment decisions

Enablers

- Open access labs, industry led research Hubs (AIR Hub)
- New modelling techniques for faster data acquisition and material card development
- accurate multi-physics models
- Hybridised development approaches leveraged from automotive supply chain
- New configurations of AAM driving new M&P opportunities, eg: Boeing X-66A truss braced wing

AIR Pass

Supporting high-potential aerospace ventures when they need it most

- **6-month** intensive collaborative prototyping effort to get to next customer
- Up to **$50K** of prototyping/engineering support
- 4-8 companies
- Agile **SPRINT-style project management** with fortnightly reviews
- Companies incorporated into the AIR Hub network to **accelerate customer growth**
- AIR Hub dedicated engineering and business support
- Swinburne University Innovation precinct residence and commercialisation support

SWINBURNE UNIVERSITY OF TECHNOLOGY

The Industry 4.0 Testlab

Additive Manufacturing of Composite Aerostructures

Take a virtual tour or come and visit us
https://www.swinburne.edu.au/research/platforms-initiatives/industry-4-0-testlab

Sustainability

Blockers

- Lack of suitably energy dense propulsion systems
- Inadequate LCA models
- Full LCA concerns - for example: battery production
- Lack of use data on net zero systems such as H2 fuel cells
- Airworthiness and crashworthiness concerns for H2 systems – lack of knowledge
- Inadequate battery management and safety case
- Cryo tank tech – huge technical challenge
- Green energy sources at point of use

Enablers

- New storage techniques – cryo, MOFs, ammonia
- Test and evaluation airport facilities
- Industry 4.0 digitalisation approaches
- Traditional OEMs driving supply chain sustainability requirements
- Hydrogen production and energy industry adoption, driving training, handling and training requirements
- Australian Aviation White Paper driving net zero targets

Australian Government

Department of Infrastructure, Transport, Regional Development and Communications

lational Emerging Aviation Technologi

POLICY STATEME

Australian Government

Civil Aviation Safety Authority

The RPAS and AAM Strategic Regulatory Roadmap

VICTO
State
Gover

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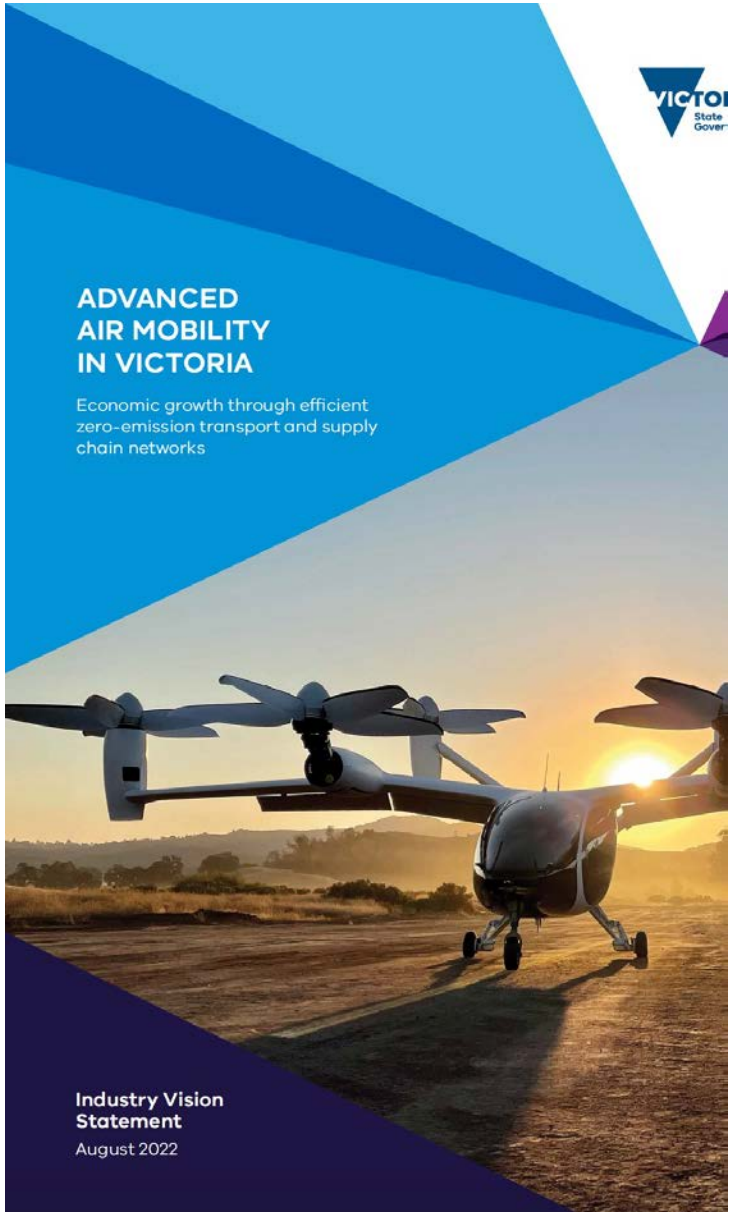
Economic growth through efficient zero-emission transport and supply chain networks



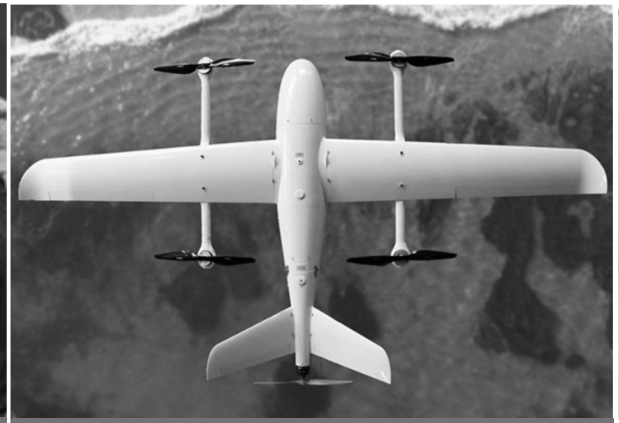
Industry Vision Statement

August 2022

Hydrogen development Roadmap

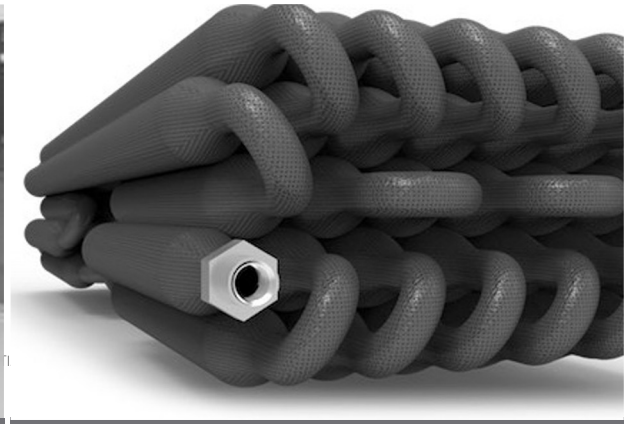
Maintaining momentum focusing on fundamental inputs to a H2 tech aero industry

SHADE – Small H2 Aircraft Development Evolution



H22S - Hydrogen to the Skies

H2 EMU – Hydrogen Electric Modeling Unit



SCHY SAVER - H2 AERO STORAGE TECH using MOFs

Advanced Air Mobility | CRC

Join Now. Launching 2025

Thank you

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