Mission Innovation
“Hydrogen Valleys” workshop

Antwerp, 26-27th March 2019

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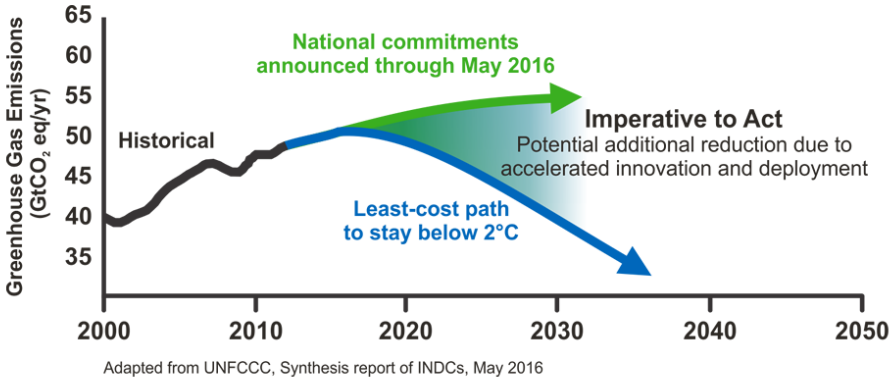
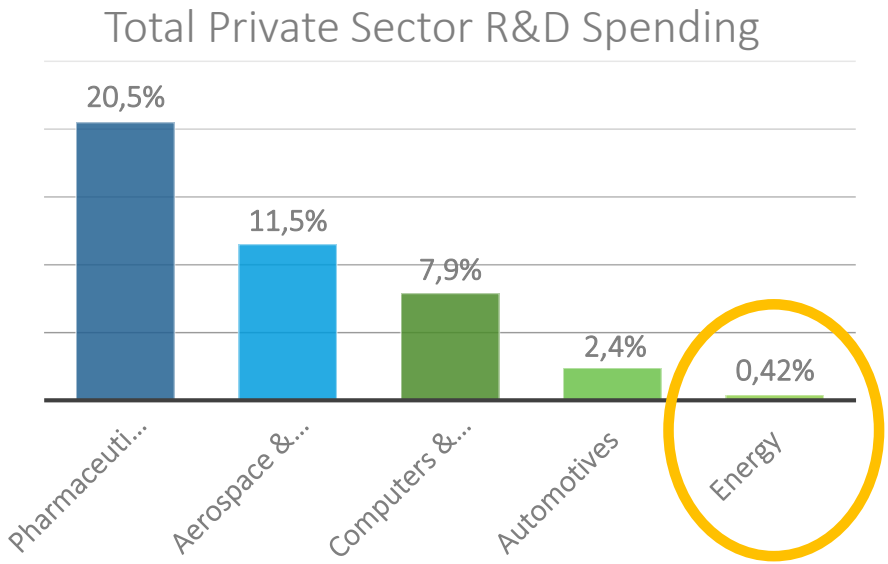
European Commission

MISSION INNOVATION
accelerating the clean energy revolution

The Challenge



Adapted from UNFCCC, Synthesis report of INDCs, May 2016



Source: American Energy Innovation Council

- Government and Business Together Can Create the Incentives for Innovation
- Attract Private Capital into a Variety of Potential Solutions
- Act Quickly Given Long Time Frames of Energy Transitions

Source: Bill Gates, "Energy Innovation: Why We Need It and How to Get It," https://gatesnotes.com/Energy/Energy-Innovation

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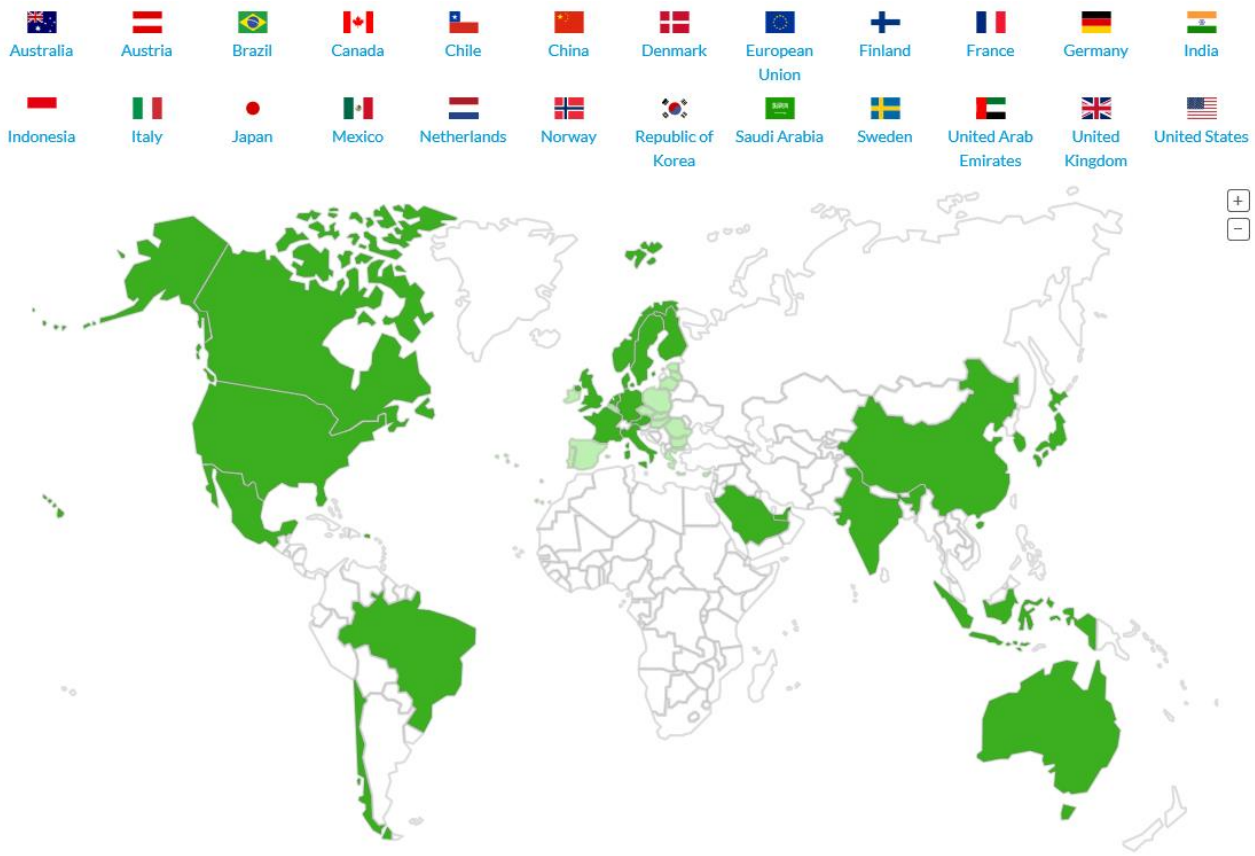
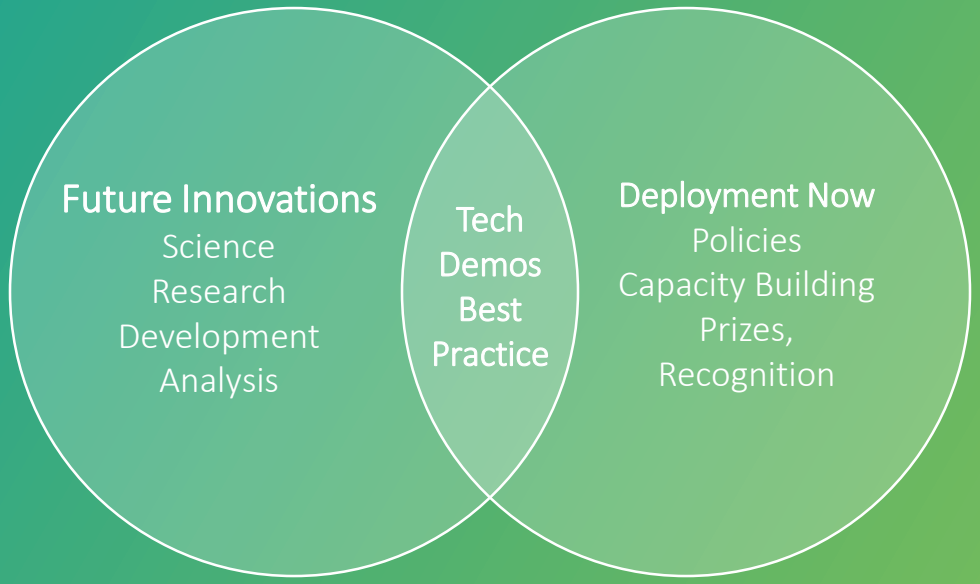
The Answer: Mission Innovation



- formed in 2015 to accelerate clean energy transition
- 23 countries + EU
- doubling R&I investment in clean energy by 2021
- facilitating greater private sector engagement in clean energy

Mission Innovation ≠Mission Regulation

Mission Innovation



Clean Energy Ministerial

Create New Ideas → Improve Performance → Reduce Cost → Raise Awareness → Facilitate Market Uptake

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8 Innovation Challenges

Renewable and Clean Hydrogen Challenge (IC#8)

launched at MI-3 (Malmö, 23-24 May 2018)

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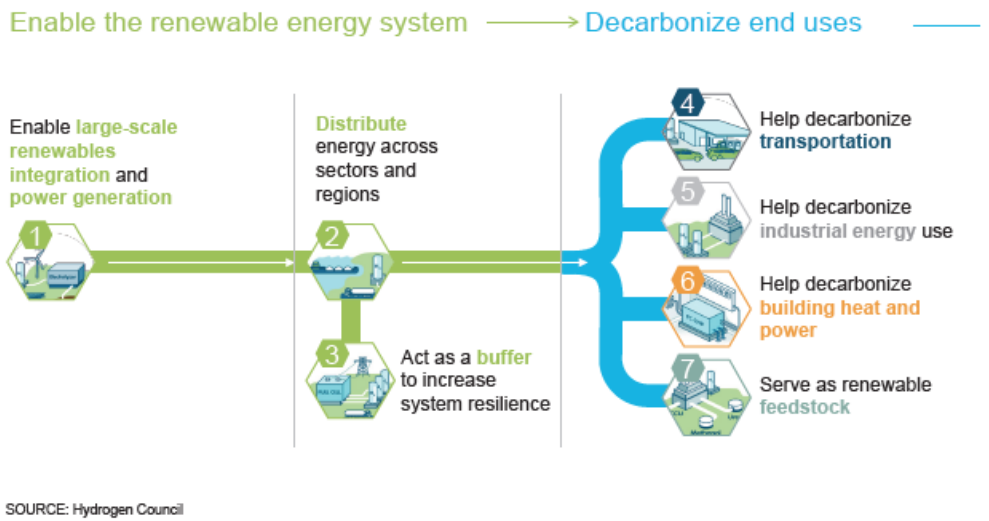
Renewable and Clean Hydrogen Challenge (IC#8)

Recognises hydrogen as a key technology for the energy transition

The objective:

To accelerate the development of a global hydrogen market by identifying and overcoming key technology barriers to the production, distribution, storage, and use of hydrogen at gigawatt scale



SOURCE: Hydrogen Council

		Australia	Austria	Brazil	Canada	Chile	China	Denmark	European Union	Finland	France	Germany	India	Indonesia	Italy	Japan	Mexico	Netherlands	Norway	Republic of Korea	Saudi Arabia	Sweden	United Arab Emirates	United Kingdom	United States
8	IC8: Renewable and Clean Hydrogen Innovation Challenge	●	○		○	○	○		●		○	●	○		○	○		○	○		○			○	○

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IC#8: Where are we? (1)

➔ First Deep Dive Workshop: Oct. 17-18, 2018, Berlin.

Identified focus areas:

- Establish an information sharing platform
- Enable large scale projects to build awareness and acceptance
- Initiate R&D

The notion of "Innovation" is much broader than "R&D" activities only and covers the full value chain from basic and applied research to market activation. IC#8 can therefore play an important role in addressing aspects related to broader energy system integration, business models, (global) market design and validation etc. (enabling regulatory frameworks are key for hydrogen, this is not in the focus of Mission Innovation)

IC#8: Where are we? (2)

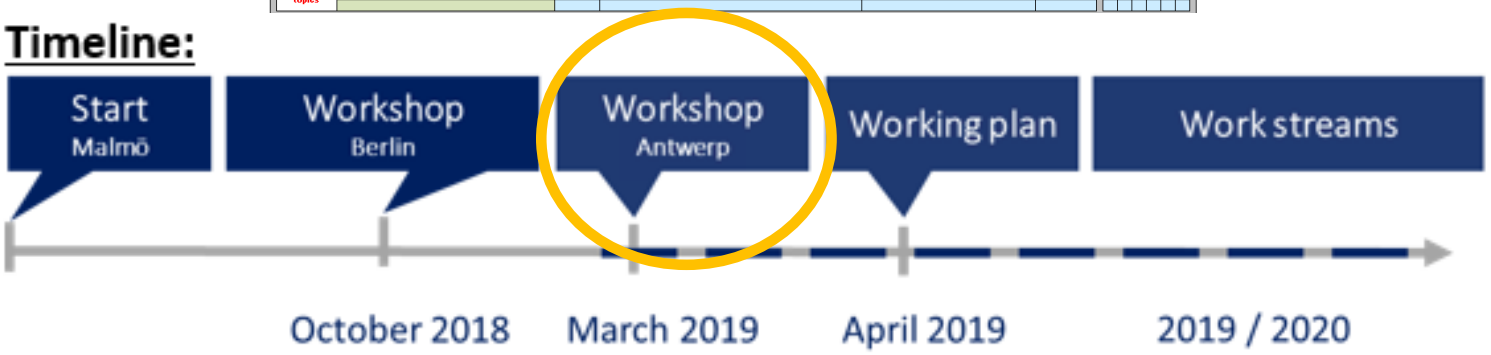
➔ Work Plan under finalization based on Member priorities submitted via IC#8 survey:

Renewable and Clean Hydrogen Innovation Challenge
Member government priorities

REV 0.1	Country		Contact Person	e-mail address	

Policy Driver	Workshop issue	Top Priorities (N/A, Low, Medium, High)	Please detail specific interest area or proposed collaboration area	Existing program/projects (if applicable)	Proposed Engagement (Lead /Participate) 1 or more of TOP priorities	IC #8 Preferred Action Type (mark with X)
Increase Demand	Turbines (hydrogen; ammonia)					
	Admixture into natural gas network/s					
	Maritime applications					
	Road transport applications (heavy duty; passenger)					
	Chemical feedstocks					
	Industrial processes					
	Other - please specify					
Enable global markets	Increasing the TRL of liquid hydrogen					
	Scaling up of technologies for liquefied hydrogen storage and transport					
	Suitable carriers for global hydrogen market and associated delivery options					
	Increase operating pressure for future pipelines					
	Increased pressure for bulk transportation					
	R&D to support harmonization of regulations for moving hydrogen around internationally					
	New materials for low temperature bulk transport (below -253 degrees C)					
	Other - please specify					
Demonstrate technology at scale and share learnings	Demonstrate that H2 technologies work at scale					
	Hydrogen Valleys (Provincials)					
	Best practice exchange and replication					
	Technologies for safety and social acceptance					
	Other - please specify					
Energy system integration	Low pressure storage					
	Technologies for safe use of NH3 hydrogen					
	Quality and purity limitations for hydrogen use					
	Other - please specify					
Additional topics						

Timeline:



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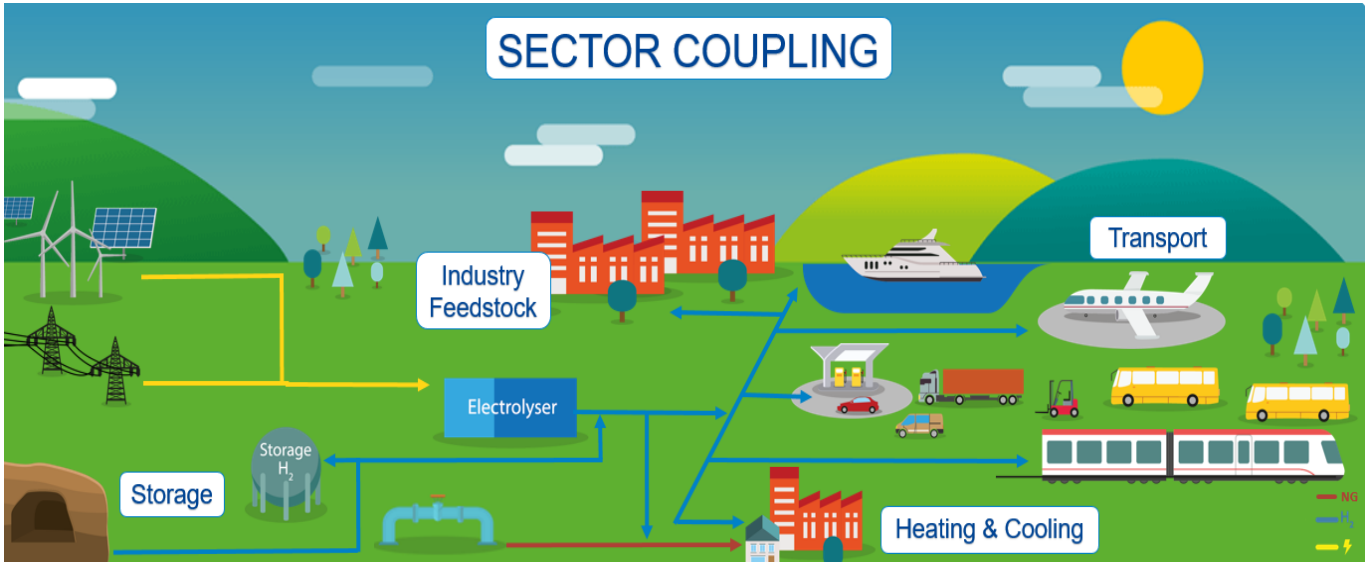
“Hydrogen Valleys”: The focus of the workshop

*A **“Hydrogen Valley”** can be defined as a geographical area - city, region, island or industrial site - where **several hydrogen applications** are combined together into an **integrated hydrogen eco-system** that consumes a significant amount of hydrogen. A Hydrogen Valley should ideally cover the entire hydrogen value chain (production, storage, distribution and final use).*



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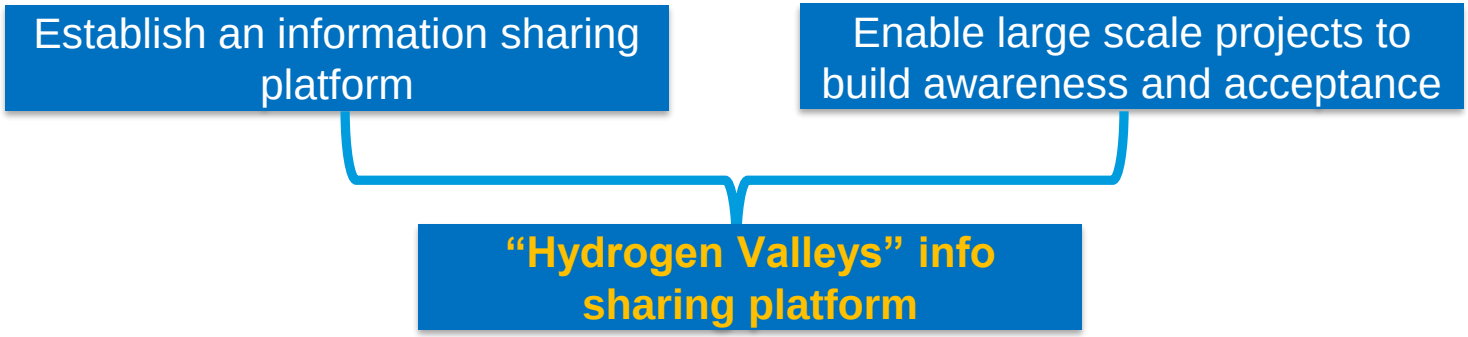
“Hydrogen Valleys”: The focus of the workshop



- Many demonstration projects have successfully shown the maturity and benefits of individual hydrogen technologies (typically either in isolation or in limited size)
- The viability of hydrogen as a **systemic solution** has not yet been showcased at scale
- The objective of IC#8 information sharing platform is to consolidate the learnings of the first emerging “H2 Valley” projects from MI members in order to accelerate the shift towards large-scale multi-application hydrogen projects

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Objectives of the workshop

1. Take stock of the status of and exchange information about the first "H2 Valley" type of projects from MI countries
2. Discuss and agree on the concept of the information-sharing platform around H2 Valleys (e.g. Where is collaboration needed most? Where is it possible? Which actions are most urgent? Etc.)
3. Final step in fixing IC#8's work-plan (government session only)

!!!! WE NEED YOUR INPUT!!!

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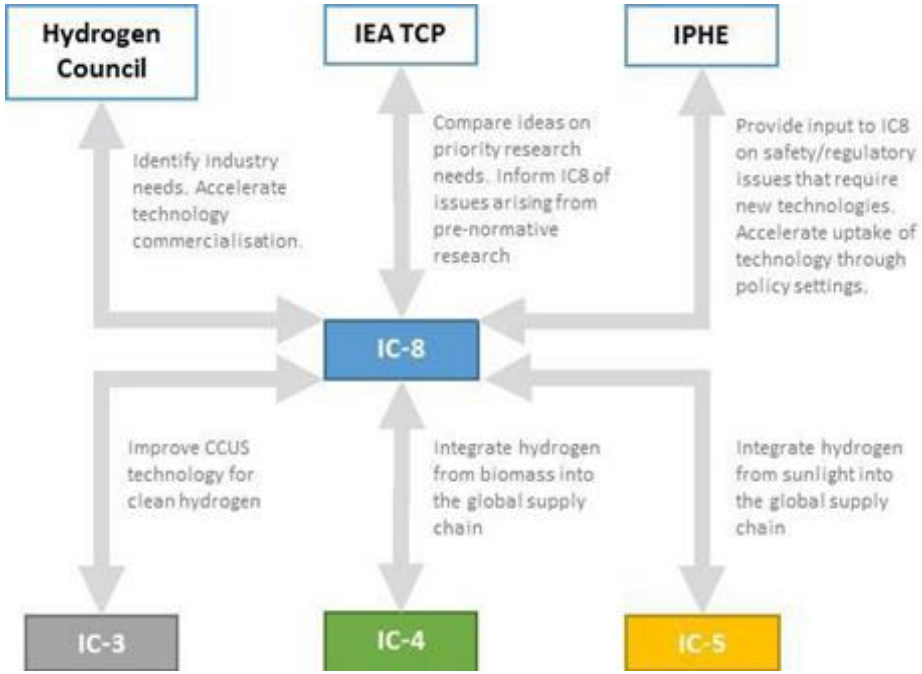
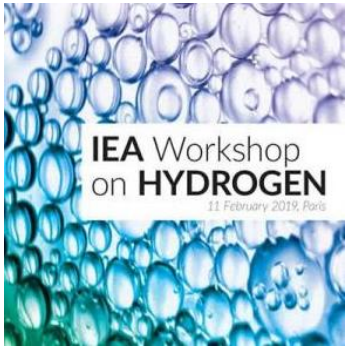
It is all about collaboration and coordination!



Mission Innovation IC#8 can provide a platform for coordination of stakeholders efforts' and for a high-level public-private dialogue.

Taking place back-to-back with Clean Energy Ministerial it is ideally placed to increase the awareness regarding the potential impact of hydrogen in the context of global CO2-reduction targets.



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House-keeping

- Please keep your badges for Day 2
- Please respect the registration list for parts of the workshop to participate in (in particular the Energy Observer breakfast)
- Last session on Day 2 is government representatives only
- The materials will be made available at the FCH JU website (link to be circulated)
- Questions?

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Thank you very much for your attention !

« A rising tide lifts all boats » …But we need to know where we are sailing to!

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