



APVentures
ADVANCE & PIONEER

Developing PGM Powered Technologies in China

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Anglo American Platinum

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Developing PGM Powered Technologies in China

- AP Ventures
- Fund rationale
- Addressing global challenges
- Creating value for the PGM industry
- Strategic importance of China's mobility sector for PGM demand
- Encouraging the ecosystems
- Summary

AP Ventures

- Independent Venture Capital Fund spun out of Anglo American in July 2018
- Investing in technology companies across three distinct sectors
 - Renewable Energy Integration
 - Resource Scarcity
 - Ageing Population
- Investment strategy
 - Early stage spanning B round through growth
 - 12 year fund, 6 years' investment period, focused platforms established within 4 years
- Strong track record
 - 5 years' experience developing existing portfolio
 - Net IRR over 40%¹
 - Strong global network spanning both mining and automotive
- Supportive investors, Anglo American and the Public Investment Corporation (South Africa) in globally recognized structure

¹audited IRR - December 2017

Fund's rationale

Strategic

- Significant opportunities for emerging PGM powered technologies
- Unique position to identify and address the industry's roadblocks
- PGM technologies as a solution to global challenges

Financial

- New applications for PGMs create differentiated high margin businesses due to the unique characteristics of these metals
- Investing in emerging minor PGM applications addresses "Catch 22"
- Deeper and earlier understanding of demand trends provides economic value to integrated market participants

How PGM Powered Technologies address Global Challenges

RENEWABLE ENERGY INTEGRATION

- Hydrogen infrastructure
- Fuel cell electric vehicles
- Energy storage

RESOURCE SCARCITY

- Water treatment
- Food preservation
- Sensors & durable electronics

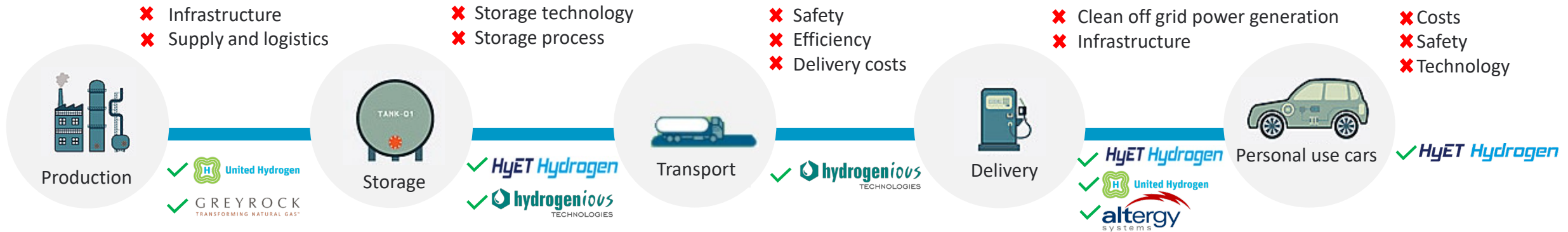
AGEING POPULATIONS

- Biomedical applications
- Dental alloys & applications
- Healthcare sensors & electronics

Two fold strategy to create value for the PGM industry



Strategy 1: Address the constraints that indirectly limit demand for major metals



Strategy 2: Directly impact demand for minor metals

- Identify earlier stage opportunities with potential for meaningful share of global demand
- Utilize broad global perspective of value-in-use across existing and emerging applications to guide investment decisions

Fund I current investment portfolio

Diverse investments made in companies delivering unique solutions to key global challenges



PEM fuel cells
Majors



Food preservation
Majors

Hydrogen-focused portfolio



Hydrogen storage & logistics
Majors & minors



Hydrogen production & logistics
Indirect impact



Direct fuel production
Minors



Hydrogen compression
Majors



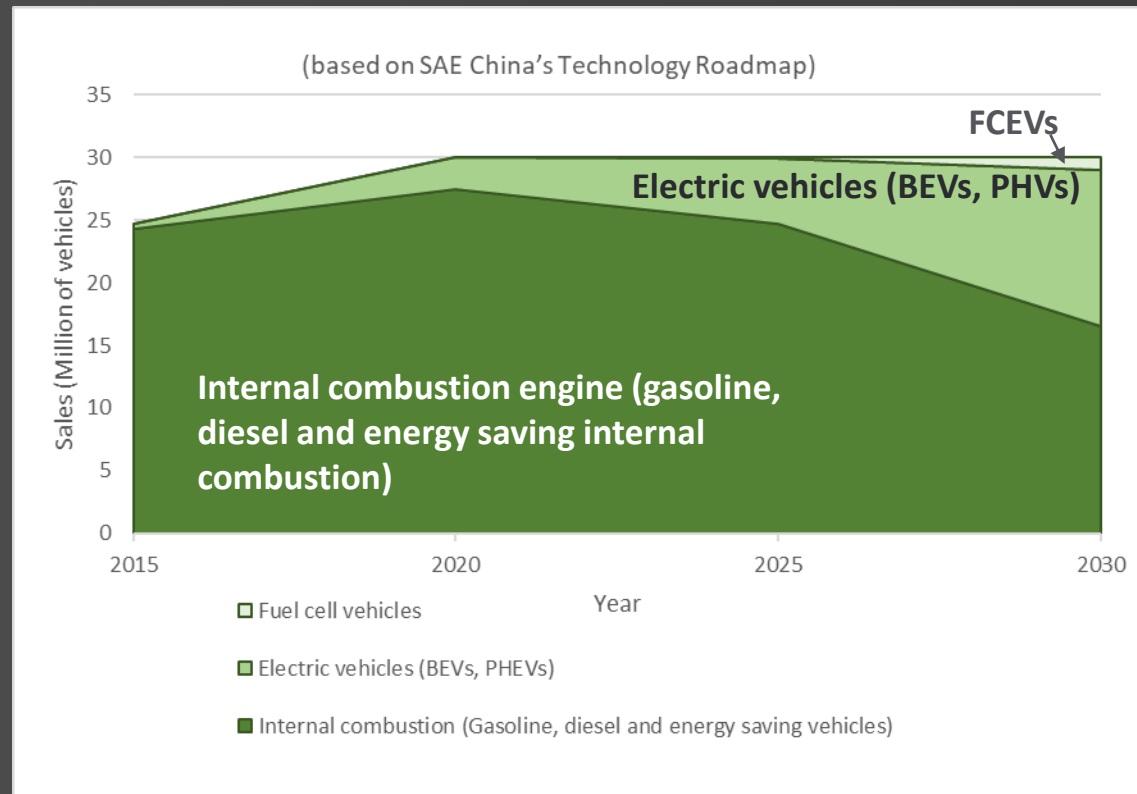
Greyrock > \$100M projects in progress & \$1B+ in project pipeline



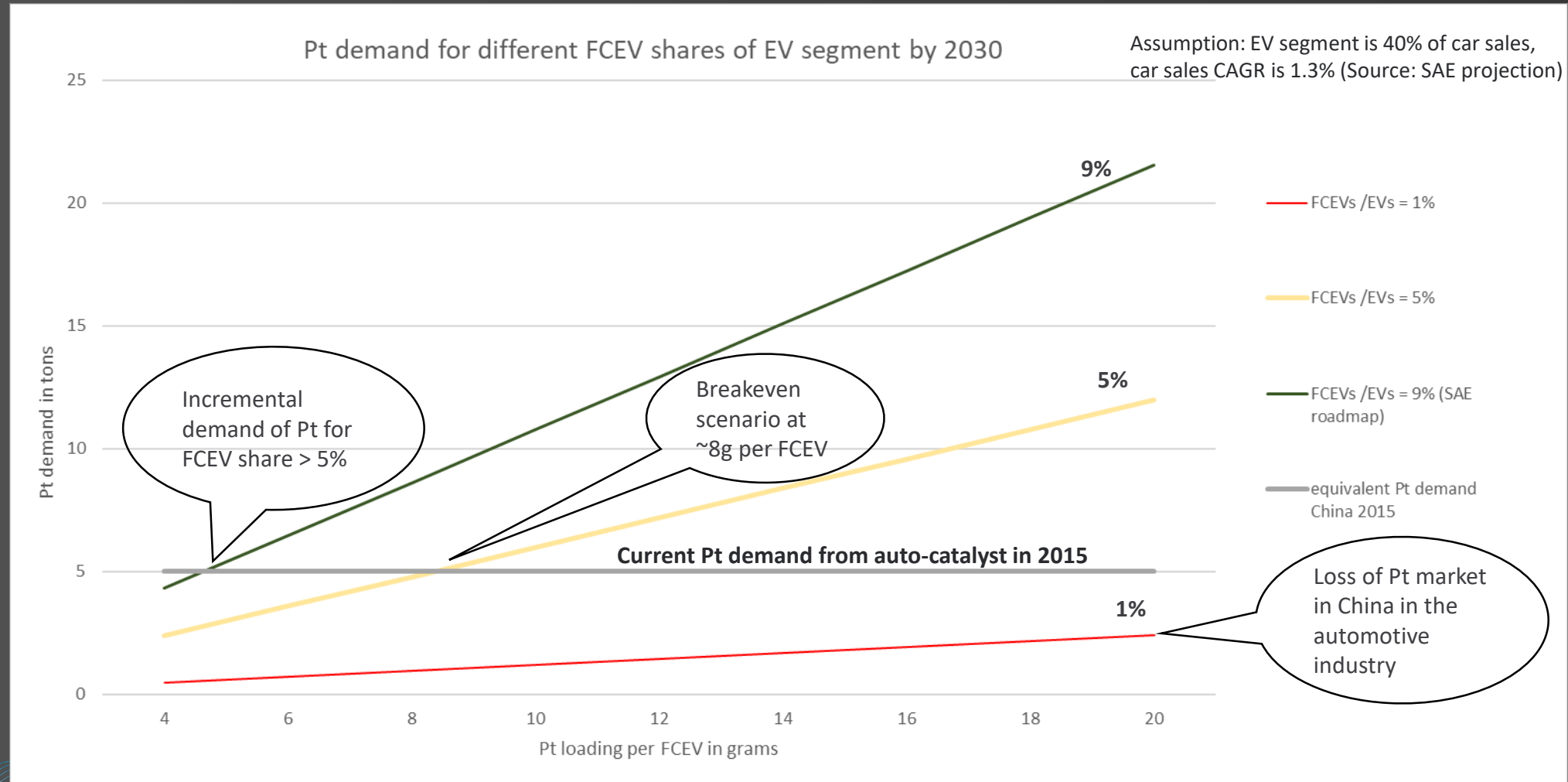
A closer look at the mobility sector in China....

China currently accounts for 30% of the global market for cars and announced an ambitious green mobility plan in 2015. **China's transition to green mobility is likely to have an impact on technology adoption worldwide.**

Roadmap to Green mobility in China - number of vehicles per powertrain technology in millions



...and how different FCEV market shares impact the Pt demand



Hydrogenious enables emission-free mobility using low cost game changing technology

Hydrogen storage and transportation – safe and efficient, using carrier oil and existing diesel fuel infrastructure

Stationary application

Enabling **commercial-scale hydrogen refueling** stations

- Low cost supply and bulk storage – 5x increase of hydrogen transported per truck
- Existing infrastructure used – carrier oil fully compatible
- No molecular hydrogen!



Mobile application

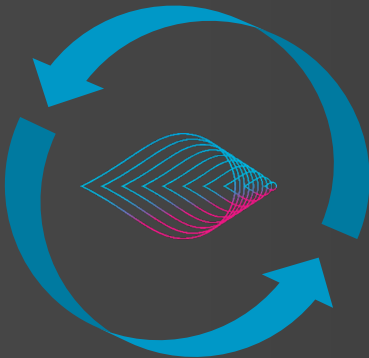
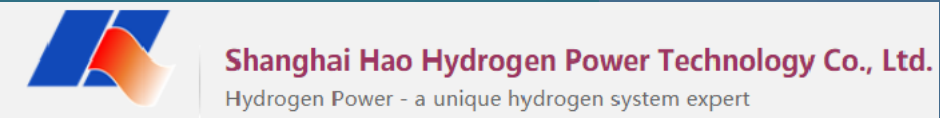
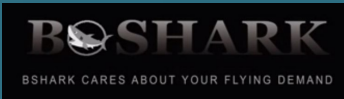
The **game changer** in emission-free mobility!

- Use of liquid fuels on-board – easy refueling and storage, just like with today's fuels
- High efficiency – Direct LOHC fuel cell (patented by Hydrogenious) enables transformative range
- 'Hydrogen-free' hydrogen use – no molecular hydrogen!



China represents not only market opportunity but also a source of innovation and capital

H2 Innovators



Market participants

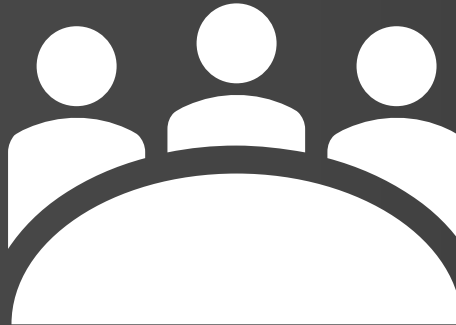
Capital sources



Supporting our portfolio

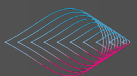
Supply Side

- Benefit from an efficient value chain
- Benefit from long-term supply and price risk mitigation strategies
- Access to innovative technology from other portfolio companies

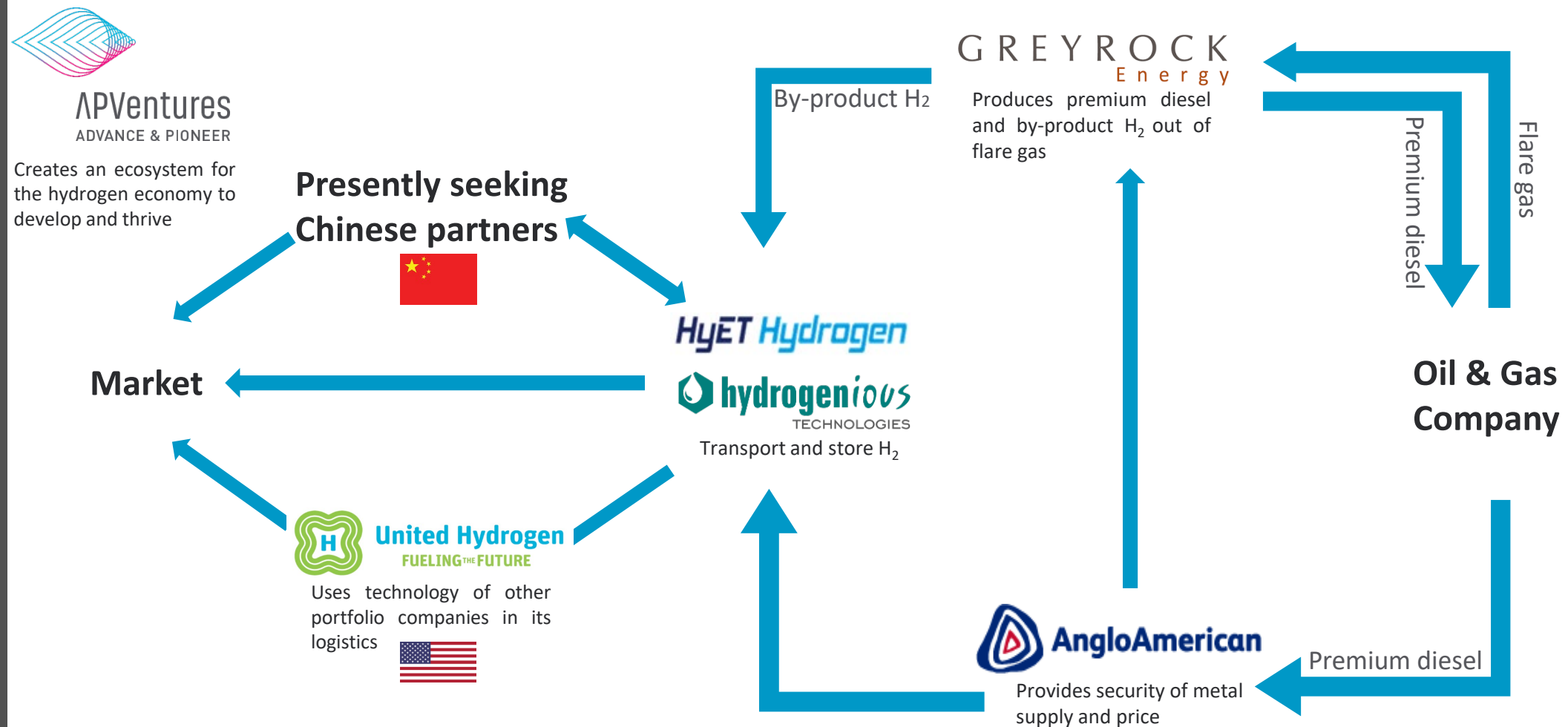


Demand Side

- Access to global recognized customers through offtake agreements with our investors
- Access to our investors' political and economic networks for market development advantage



An example of how AP Ventures enables the H₂ economy



The hydrogen opportunity in China

- AP Ventures is a uniquely positioned fund
- Strong expertise and network in the PGM industry critical to unlocking the H₂ value chain
- Exciting opportunities to scale these applications in the Chinese market through existing portfolio companies as well as new ventures

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