NEXTCHEM

UNFOLD
STAMICARBON
15TH SYMPOSIUM 2026

INTEGRATION OF AMMONIA, UREA AND NITRATES FOR SUSTAINABLE FERTILIZER PRODUCTION

Luca Amicucci

AGENDA

01

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15TH SYMPOSIUM 2026

INTRODUCTION

INTEGRATION FOR SUSTAINABLE FERTILIZERS

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INTRODUCTION

FROM NG/ELECTRICITY TO NITROGEN FERTILISERS

NX CPO

NX Reform

NX AdWinHydrogen

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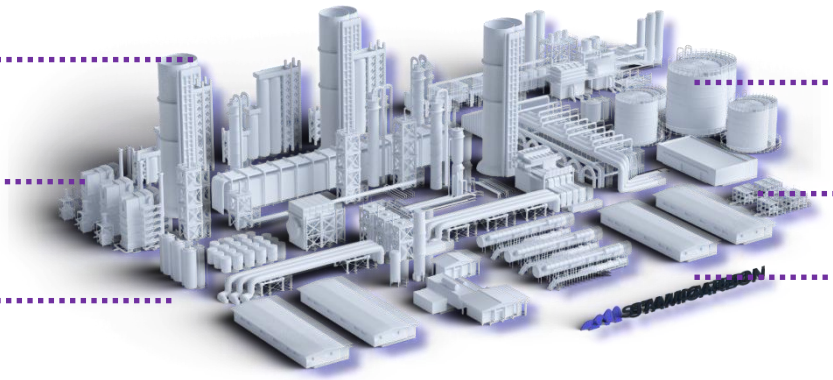

NX STAMI ammonia

NX STAMI urea

NX STAMI Nitrates

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INTRODUCTION

PROCESS & UTILITY INTEGRATION

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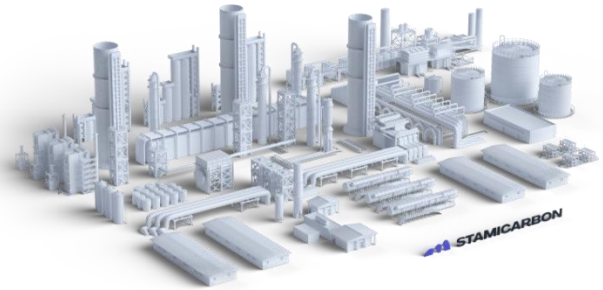
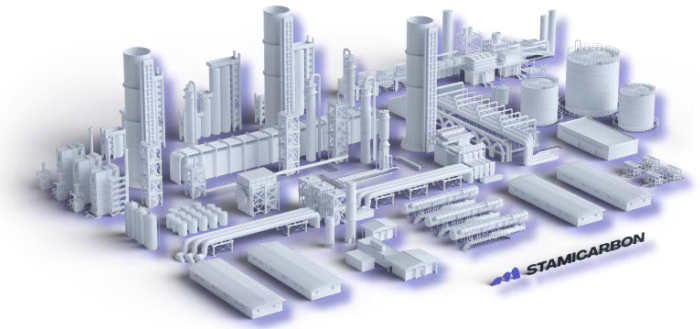


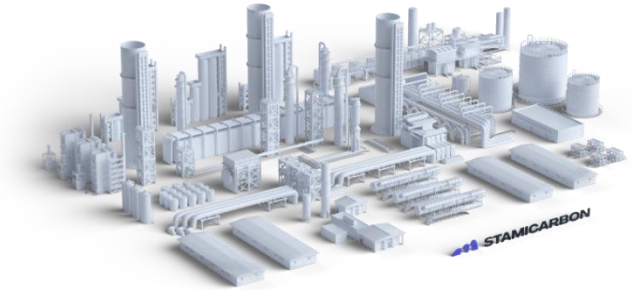
HPU

AMMONIA



UREA

NITRATES



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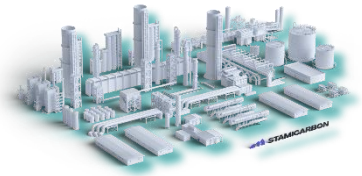
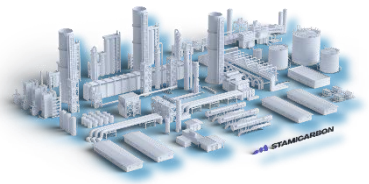
INTRODUCTION

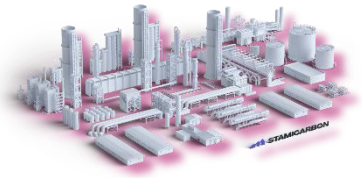
Examples from existing projects



DEF → 615 MTPD DEF (32.5 wt%)



CAN → 500.000 TPY CAN



Small-scale Urea → 100 MTPD urea granules

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INNOVATIVE APPROACH TO DEF PRODUCTION

INNOVATIVE APPROACH TO DEF PRODUCTION

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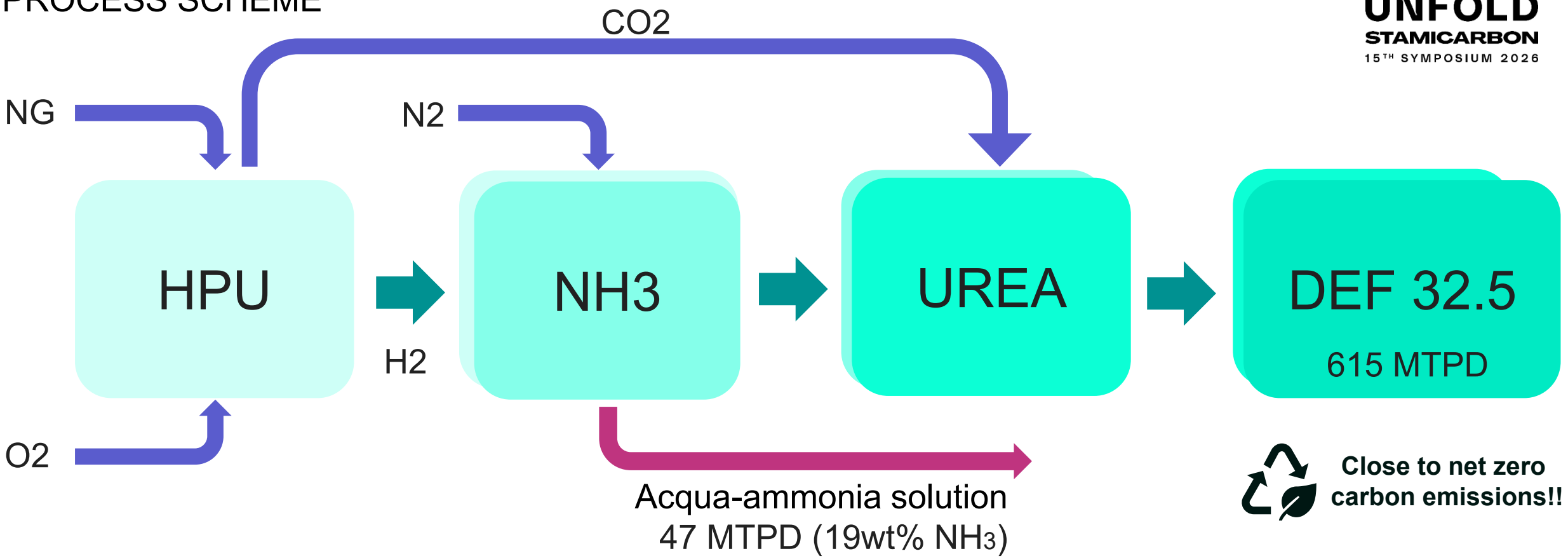
PROCESS SCHEME



Close to net zero carbon emissions!!

More details about HPU tech. available at “Syngas production & Carbon capture (Front-end ammonia)” from Cristina Guazzotti & Alexander Schulz
More details about NH3 tech. available at “Enabling Decentralized Ammonia Production with NX STAMI™ HP Synloop, Beyond the Base Case” from Mahal Patel
More details about urea tech. available in urea process presentation

INTEGRATION FOR DEF PRODUCTION

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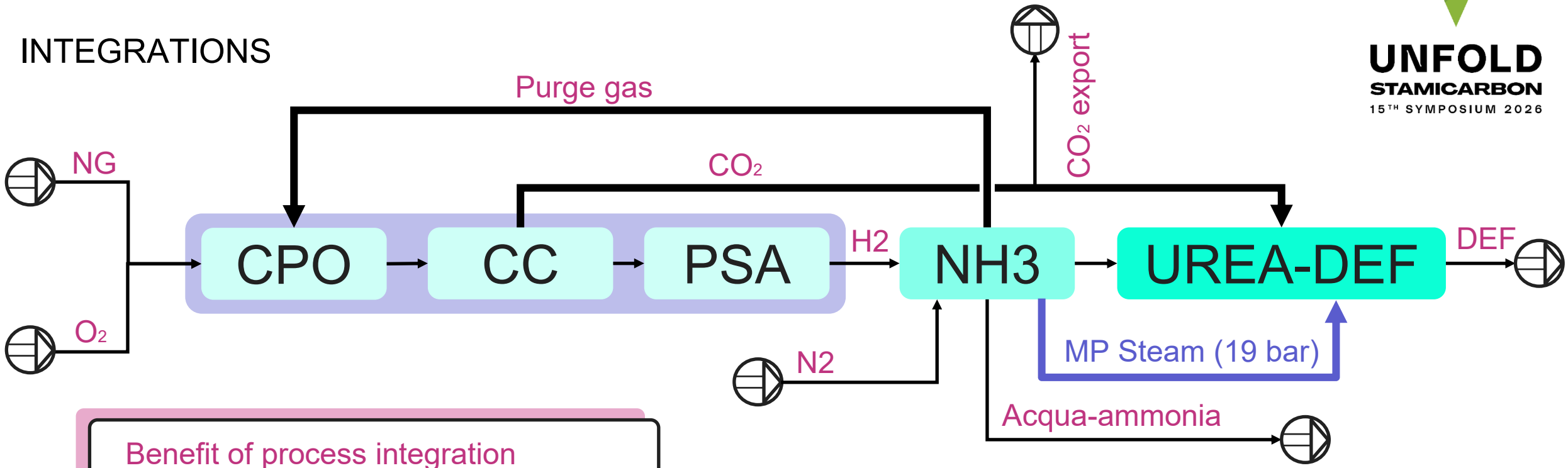
INTEGRATIONS



Benefit of process integration

- Minimized carbon footprint & efficient CO2 supply for urea production. CO2 urea demand met entirely from HPU.
- Low NG Consumption. Ammonia purge gas stream as supplementary feedstock for CPO reactor.

Benefit of steam integration

- Self-sufficient steam production across HPU, ammonia, urea. No need of steam import.

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DECARBONIZING FOOD VALUE CHAIN – SUSTAINABLE CAN PRODUCTION

SUSTAINABLE CAN PRODUCTION

PROCESS SCHEME

FertigHy

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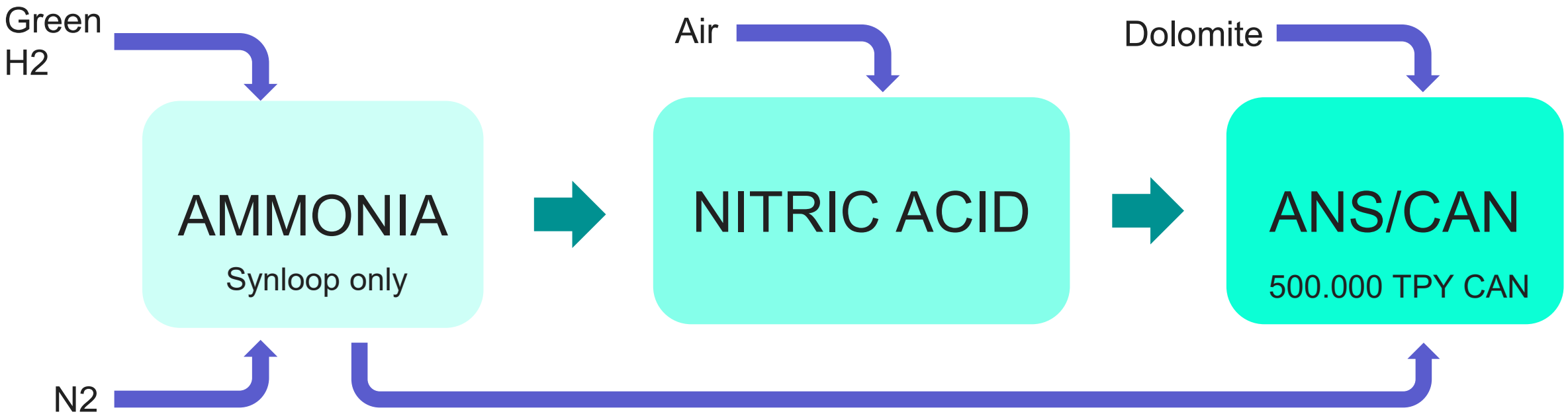

More details about ammonia tech. available at “Enabling Decentralized Ammonia Production with NX STAMI™ HP Synloop, Beyond the Base Case” from Mahal Patel
More details about nitric acid tech. available at “Next generation Nitric Acid production: Total recycle and alternative concepts” from Paz Munoz
More details about ammonium nitrate tech. available at “Back-end nitrates (finishing technology)” from Massimo Gori

INTEGRATION FOR CAN PRODUCTION

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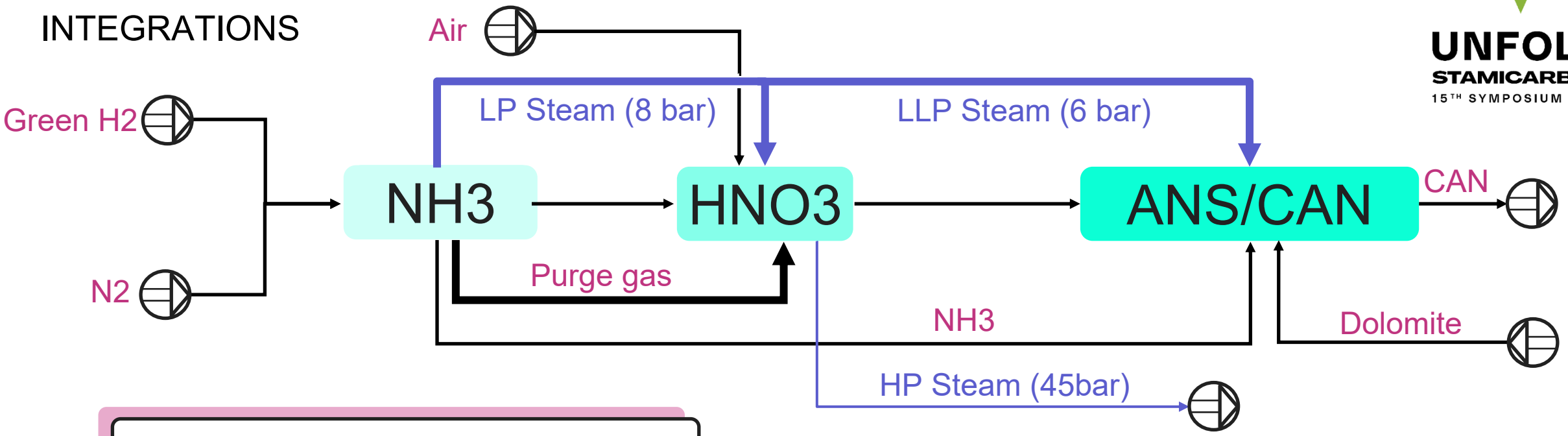
INTEGRATIONS



Benefit of process integration

- Ammonia recovered from purge gas in HNO3 burner. No need of purge gas absorber and ancillary equipment. Capex/Opex adv.
- Optional: Possibility of O2 integration from electrolyser to HNO3 plant.

Benefit of steam integration

- Maximizing HP steam export for power generation, via production of LP steam for nitric acid plant & LLP steam for ANS/CAN plant. No need of steam import

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IDENTIFYING SYNERGIES IN SMALL-SCALE UREA PLANT

SUSTAINABLE SMALL SCALE UREA PRODUCTION

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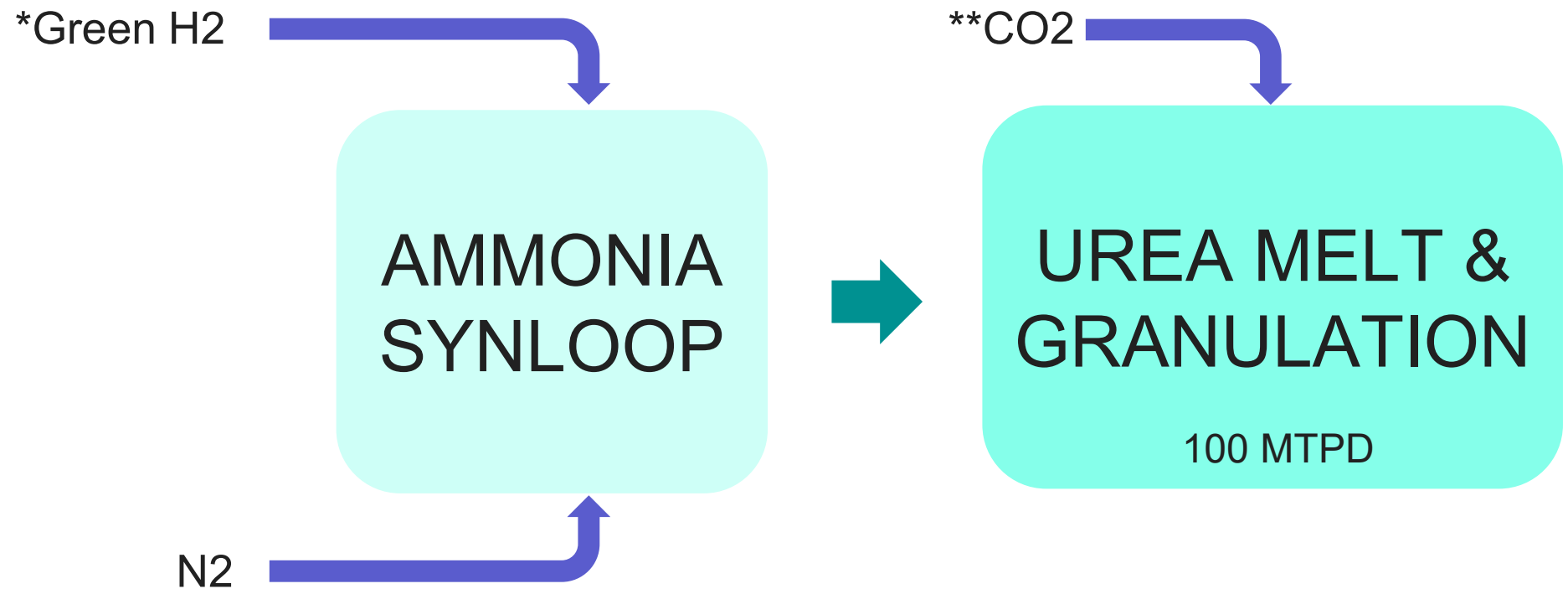
PROCESS SCHEME



*derived from electrolysis via renewables
**from CO2 pipeline/close by factory

More details about ammonia synloop tech. available at “high pressure ammonia synloop” from Mahal Patel
More details about urea tech. available in urea process presentation

INTEGRATION FOR SMALL SCALE UREA PRODUCTION

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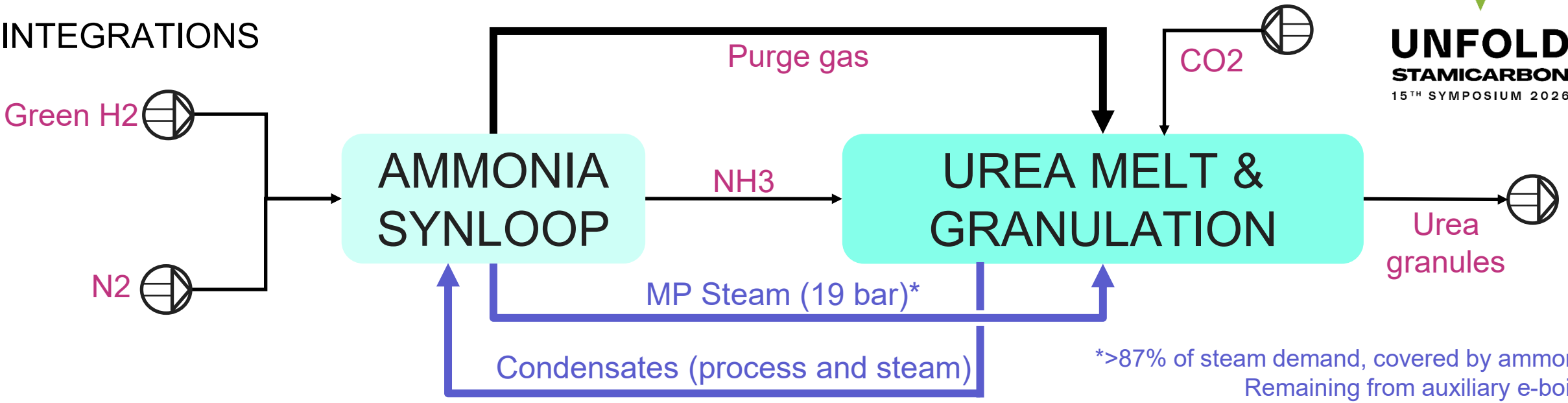
INTEGRATIONS



*>87% of steam demand, covered by ammonia
Remaining from auxiliary e-boiler

Benefit of process integration

- Ammonia recovered from purge gas in LP absorber. No need of purge gas absorber and ancillary equipment. Capex/Opex adv

Benefit of steam & utility integration

- Self-sufficient steam production. Entire steam demand covered with support of small e-boiler. Purified process and steam condensate from urea process used as BFW for ammonia plant.

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CONCLUSION

INTEGRATION FOR SUSTAINABLE FERTILIZERS

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CONCLUSIONS

ONE STOP SHOP

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- **Higher degree of confidence to investors**
- **Integrated performance guarantees for the whole complex**
- **High degree of integration in terms of process, utility & energy usage**

PROCESS & UTILITY INT.

DEF

Integration for production of DEF from NX CPO, NX STAMI Ammonia, NX STAMI Urea

SMALL-SCALE UREA

Integration for production of Urea from NX STAMI ammonia, NX STAMI Urea

CAN

Integration for production of CAN from NX STAMI ammonia, NX STAMI Nitrates

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THANK YOU