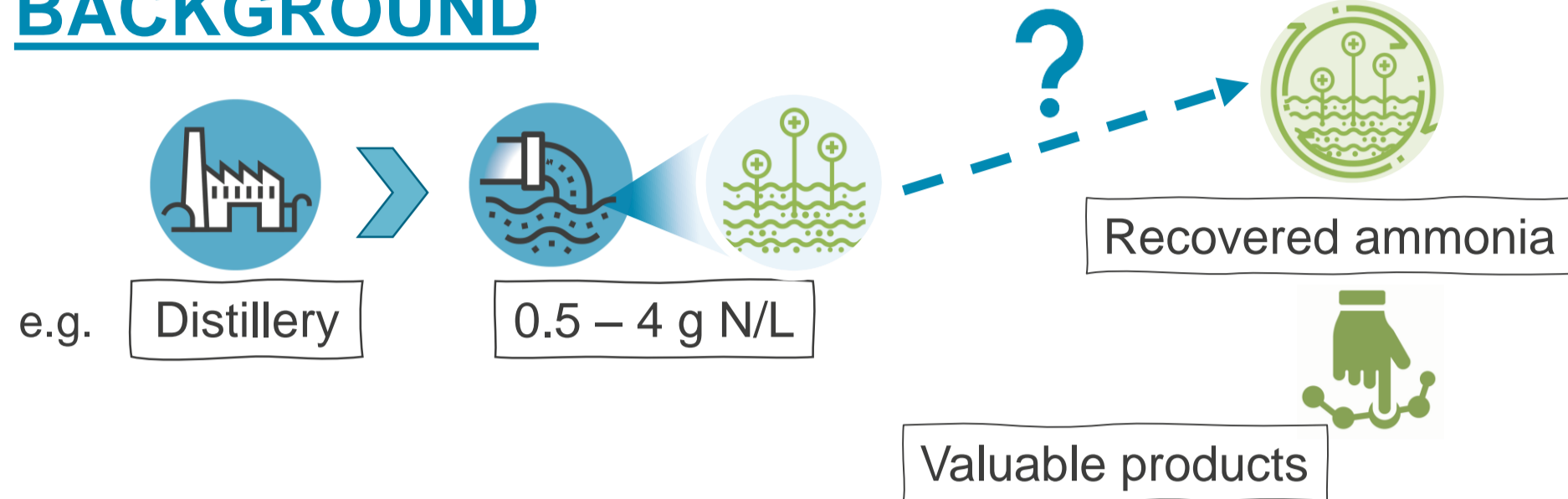


CS7 – AMMONIA RECOVERY FROM INDUSTRIAL WASTEWATER

The case of pre-treated whisky distillery effluent

BACKGROUND

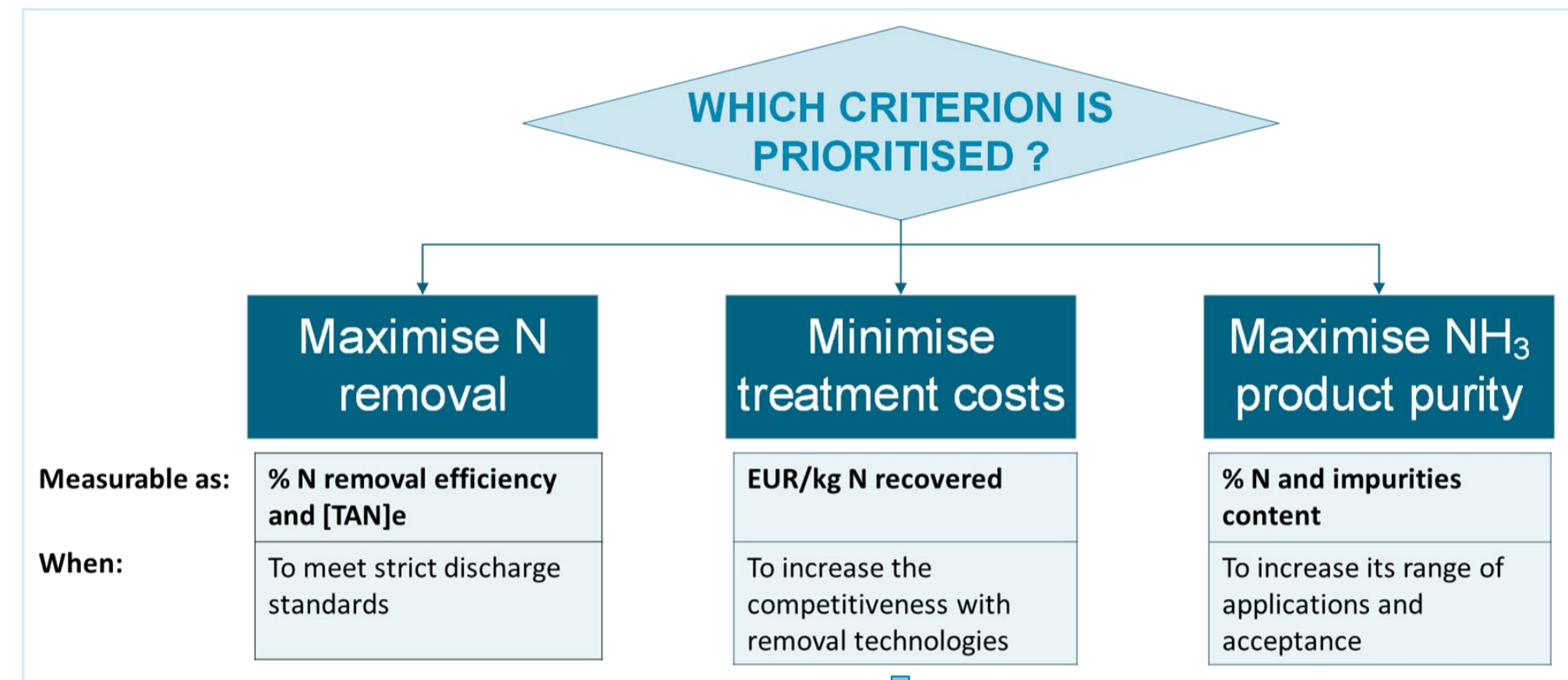
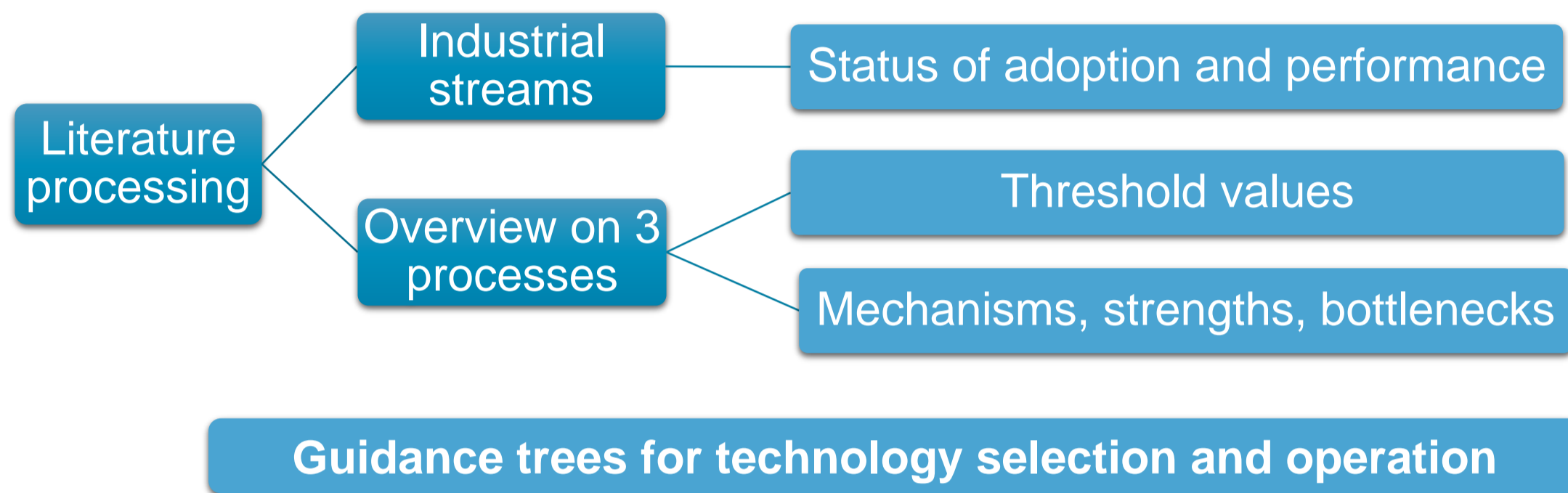


OBJECTIVES

- Provide preliminary guidance for ammonia harvesting **technology selection** and **operation**, based on wastewater physico-chemistry.
- Highlight processes **bottlenecks**, **opportunities**, **research areas**.



METHODOLOGY

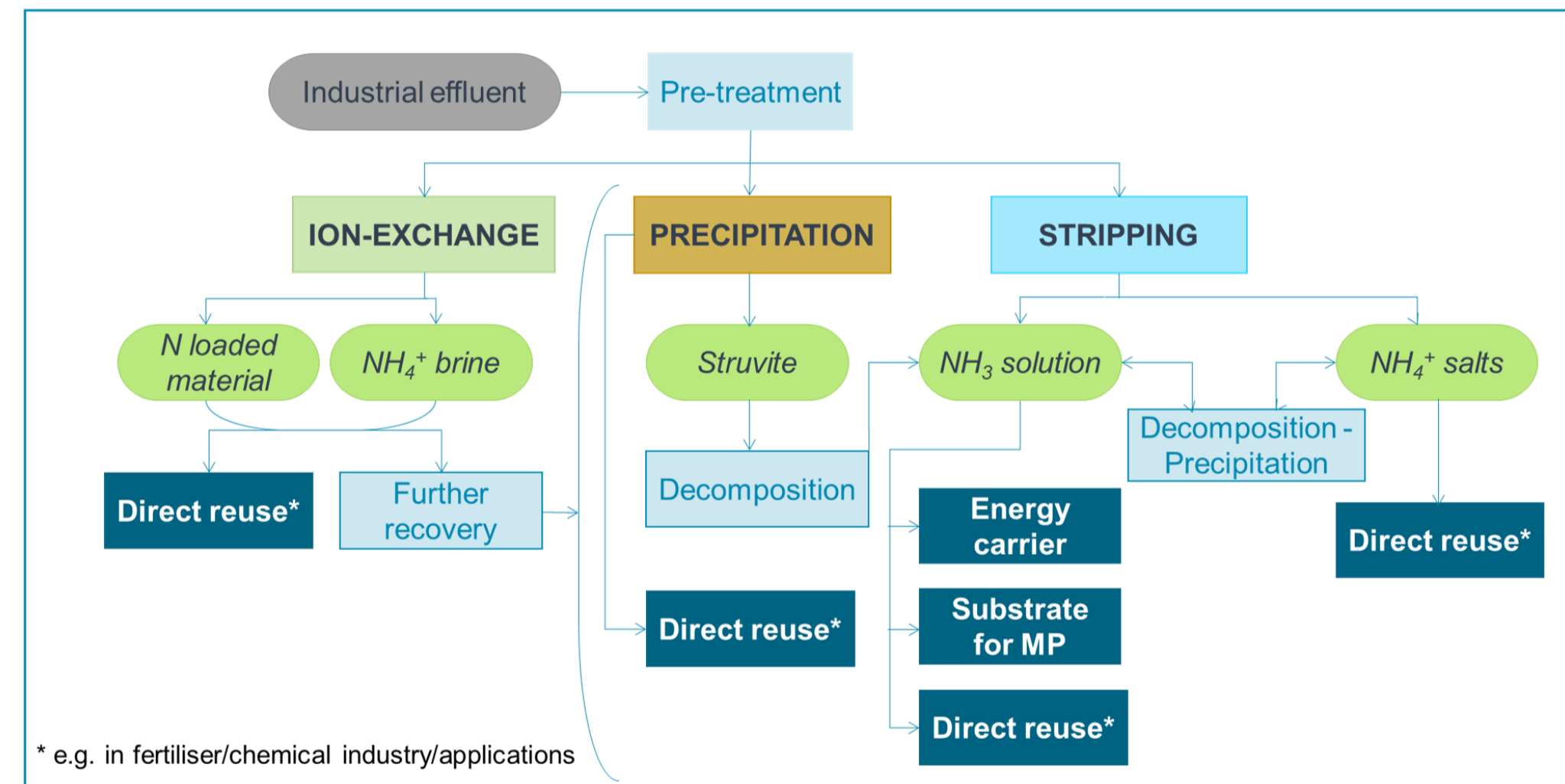


Profile of the anaerobically treated distillery wastewater in Tain (CS7)

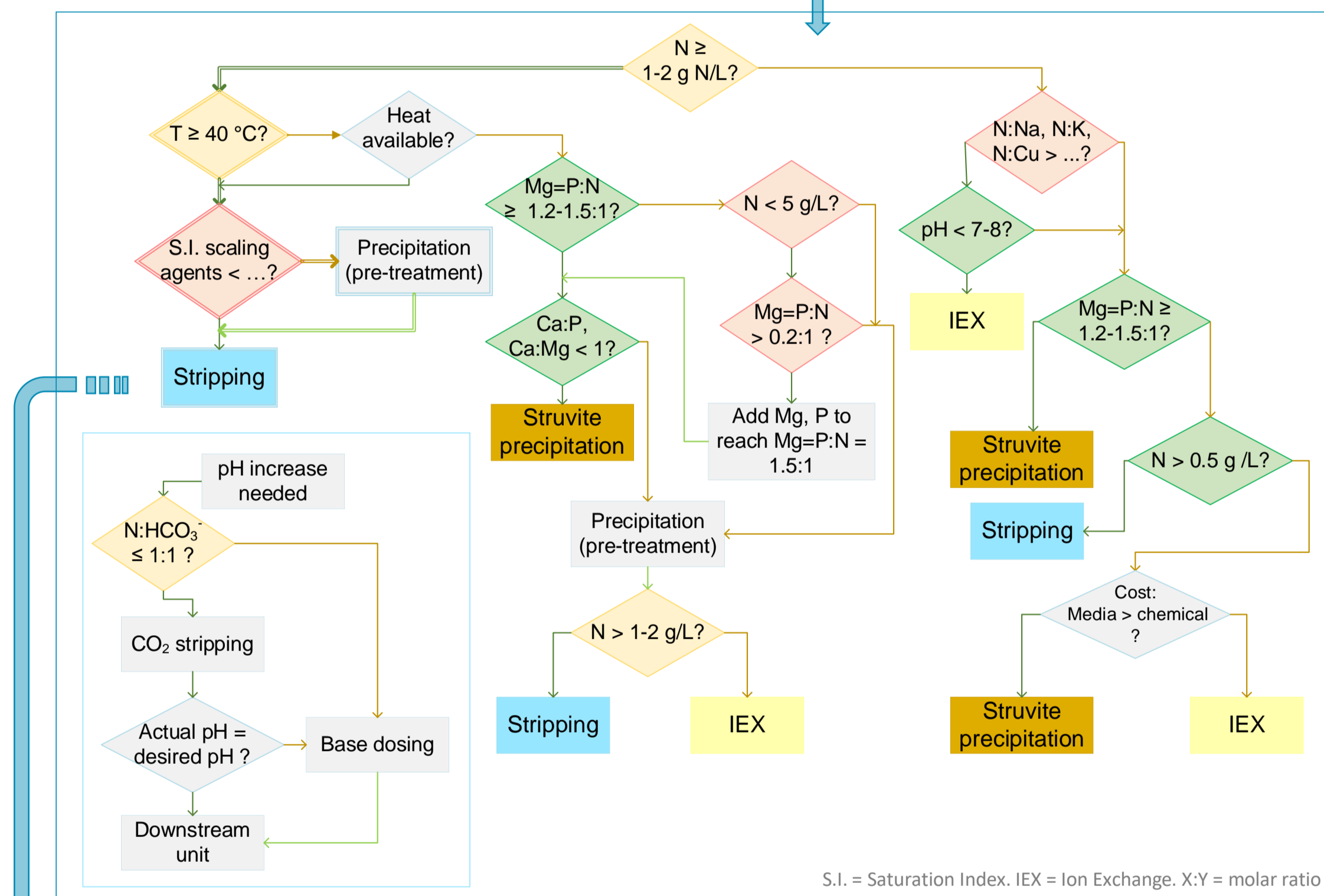
	Avg ± St.dev *	n		Avg ± St.dev *	n		Avg ± St.dev *	n
pH	7.16 ± 0.34	33	[TN]	824 ± 76	32	[Alk] _t	3265 ± 791	33
Temp. (°C)	37.8 ± 2	619	[TAN]	801 ± 96	33	[SO ₄]	532 ± 572	22
EC (mS/cm)	5.88 ± 0.63	33	[PO ₄ -P]	210 ± 23	33	[Cl]	246 ± 30	22
[TSS]	85 ± 135	33	[Mg]	40 ± 30	33	[Na]	406 ± 103	33
[COD] _t	554 ± 195	33	[Ca]	368 ± 121	33	[Cu]	0.99 ± 0.71	271

* mg/L

Ammonia harvesting technology products



Technology guidance (selection and operation)

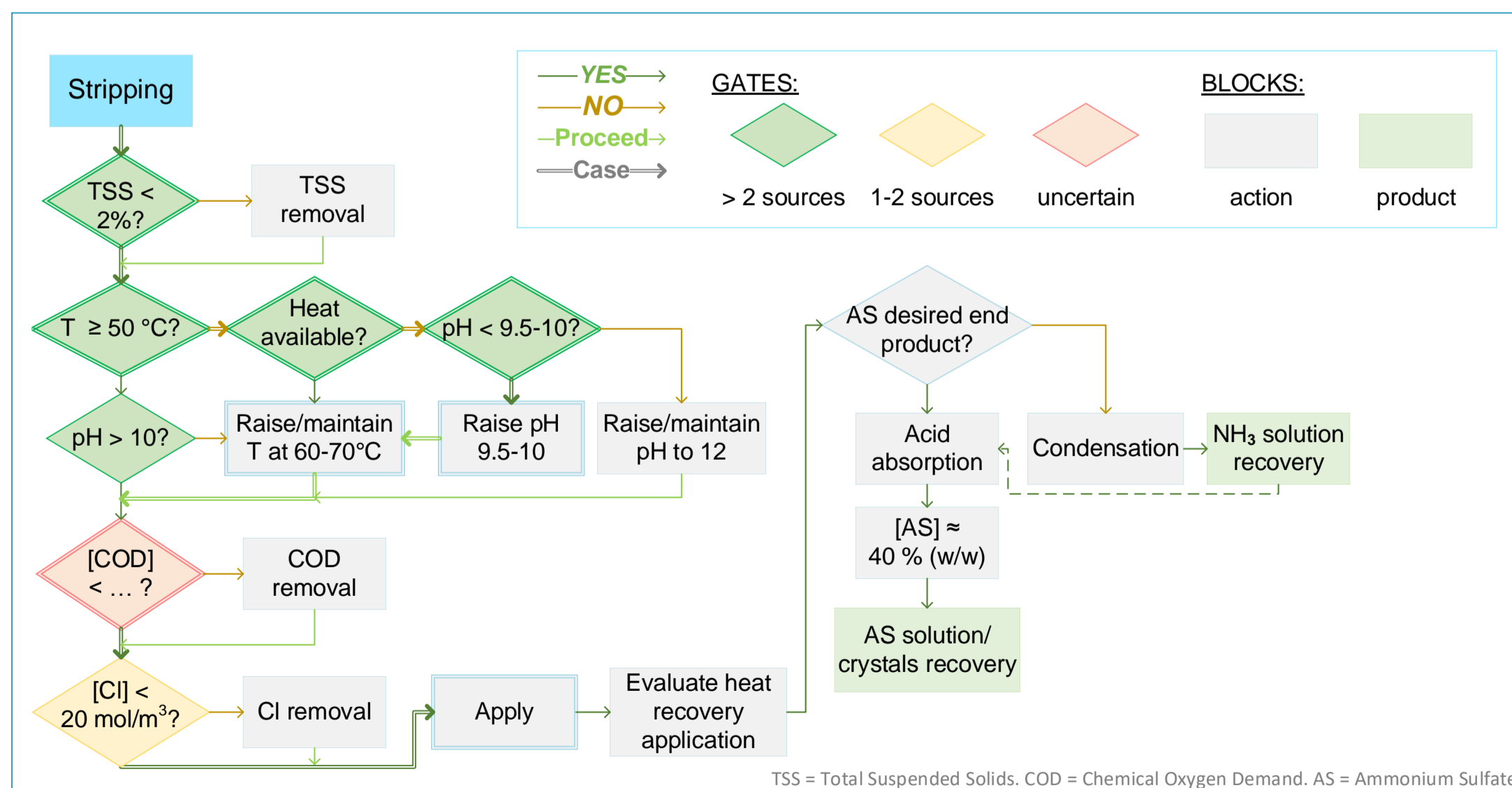


GAINED INSIGHTS

- Identification and relation between technologies' major **bottlenecks**.
- Identification of areas for further **research investigation** e.g. impact of metals, VOCs on technology performance.

Status of adoption and performance:

- Most **popular segregation routes** to harvest ammonia from industrial streams were **precipitation, stripping**:
 - IEX improvement → potential complementary - competing technology.
- Major trends in peer-reviewed articles = **lab scale**, **lack** of **economic** data:
 - Need for demonstration scale studies and economic assessment.
- Mostly **fertiliser** products (struvite, ammonium salts) generated:
 - Purity and form of the harvested NH₃ can promote recovery and broaden its uses.



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