

WaterBackpack “PAUL[®]” for **disasters** and for **permanent water supply**

Distribution of PAUL[®] and PAUL[®] stations



sponsored by



Deutsche
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Franz-Bernd Frechen, IWA Fellow
Chair, IWA Specialist Group „Membrane Technology“
2014-2017

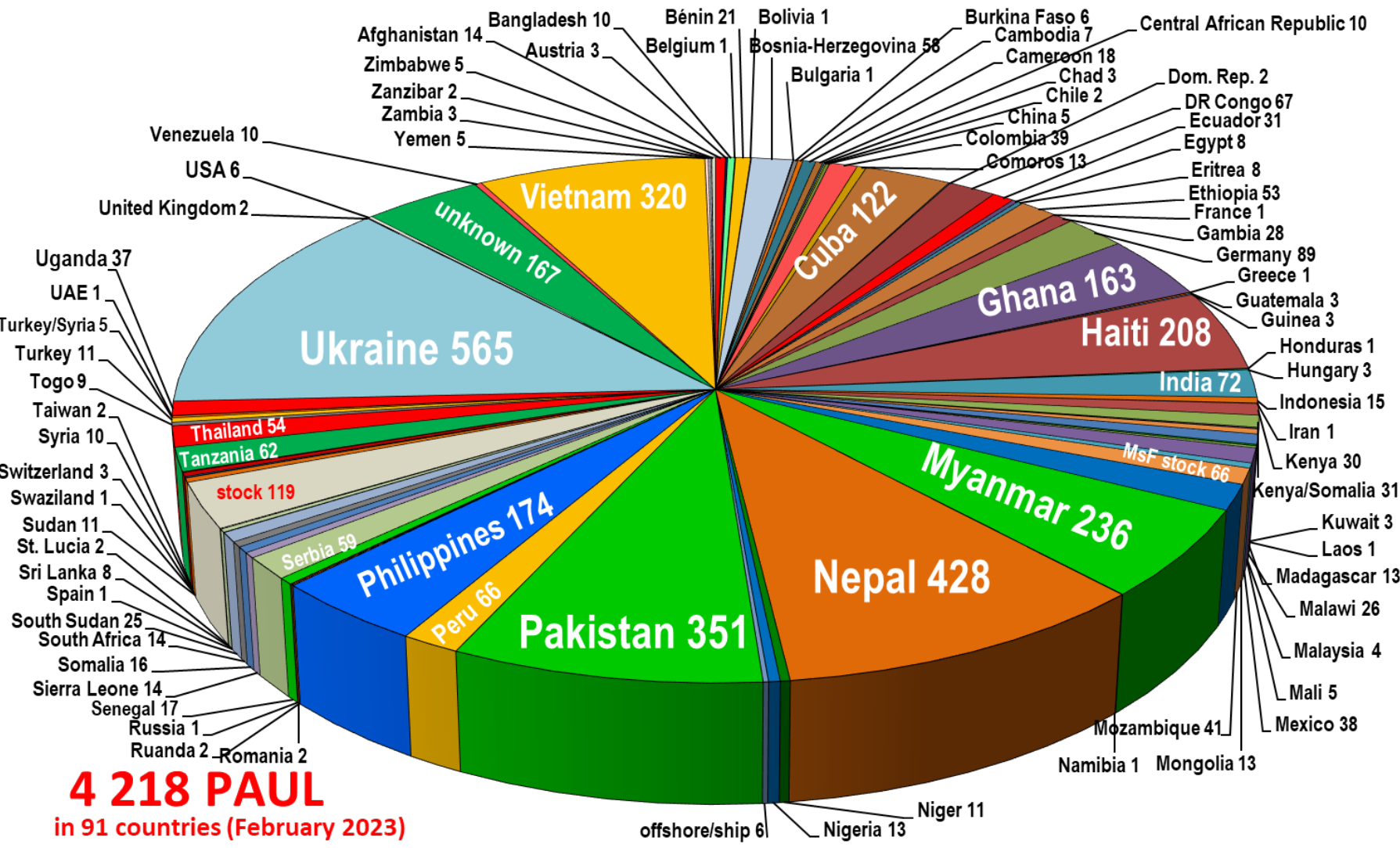
Former Chair, DWA Committee on
„Membrane Bioreactors“



timeline of PAUL development

- ➔ 2001: started tests
- ➔ 2002: first appearance in a television broadcast in Germany
- ➔ 2005:
Frechen & Waldhoff:
Water supply from surface waters with a small gravity flow membrane filtration unit for use in cases of disasters
IWA Specialty Conference “Wastewater Reclamation & Reuse for Sustainability (WRRS 2005)”, Nov. 8-11.2005, Jeju, Korea
- ➔ 2006: sample **PAUL** unit presented
- ➔ ... many presentations (but unfortunately not enough publications)
- ➔ 2010: **NGOs start distribution** of **PAUL** for emergencies
- ➔ 2013: creating the acronym “**ULP-UF**” for **Ultra Low Pressure Ultrafiltration**
- ➔ 2013: explaining **cake layer control** at the 7th IWA-MTC in Toronto
- ➔ 2014: beginning of usage for **permanent supply**: “**PAUL station**”
- ➔ 2022: **4,000+** units in **90** countries, **800+** for permanent supply

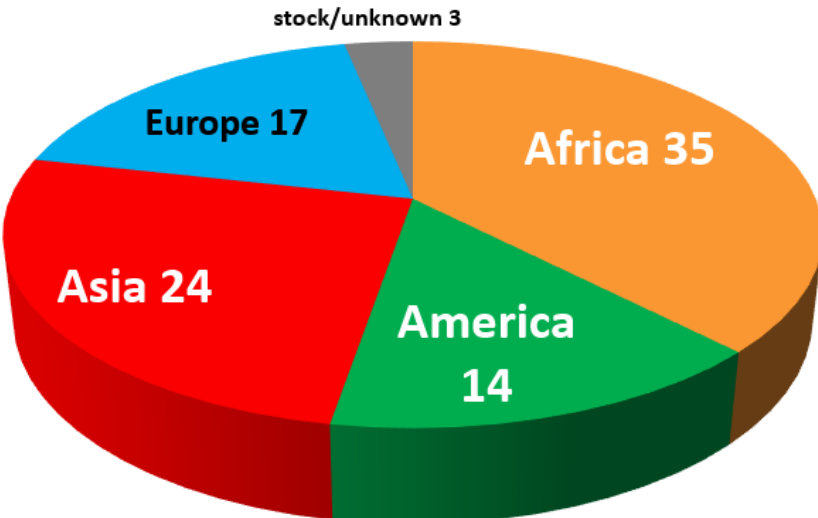




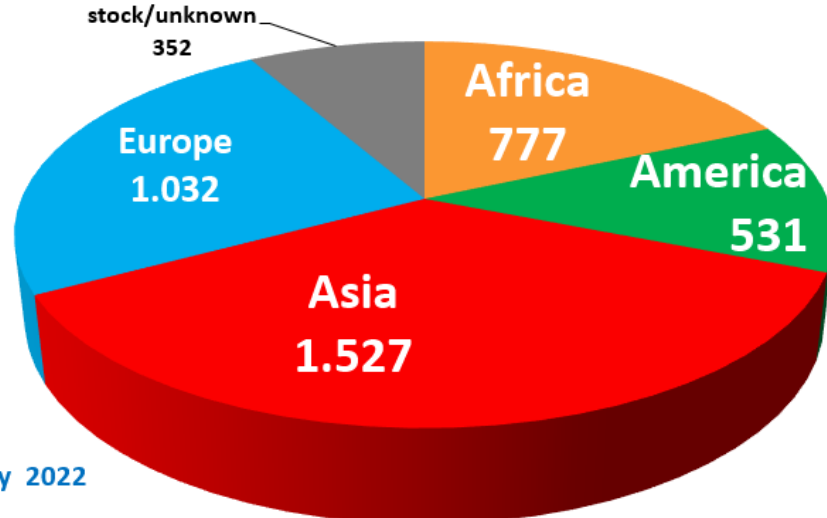
4 218 PAUL
in 91 countries (February 2023)



91 Countries



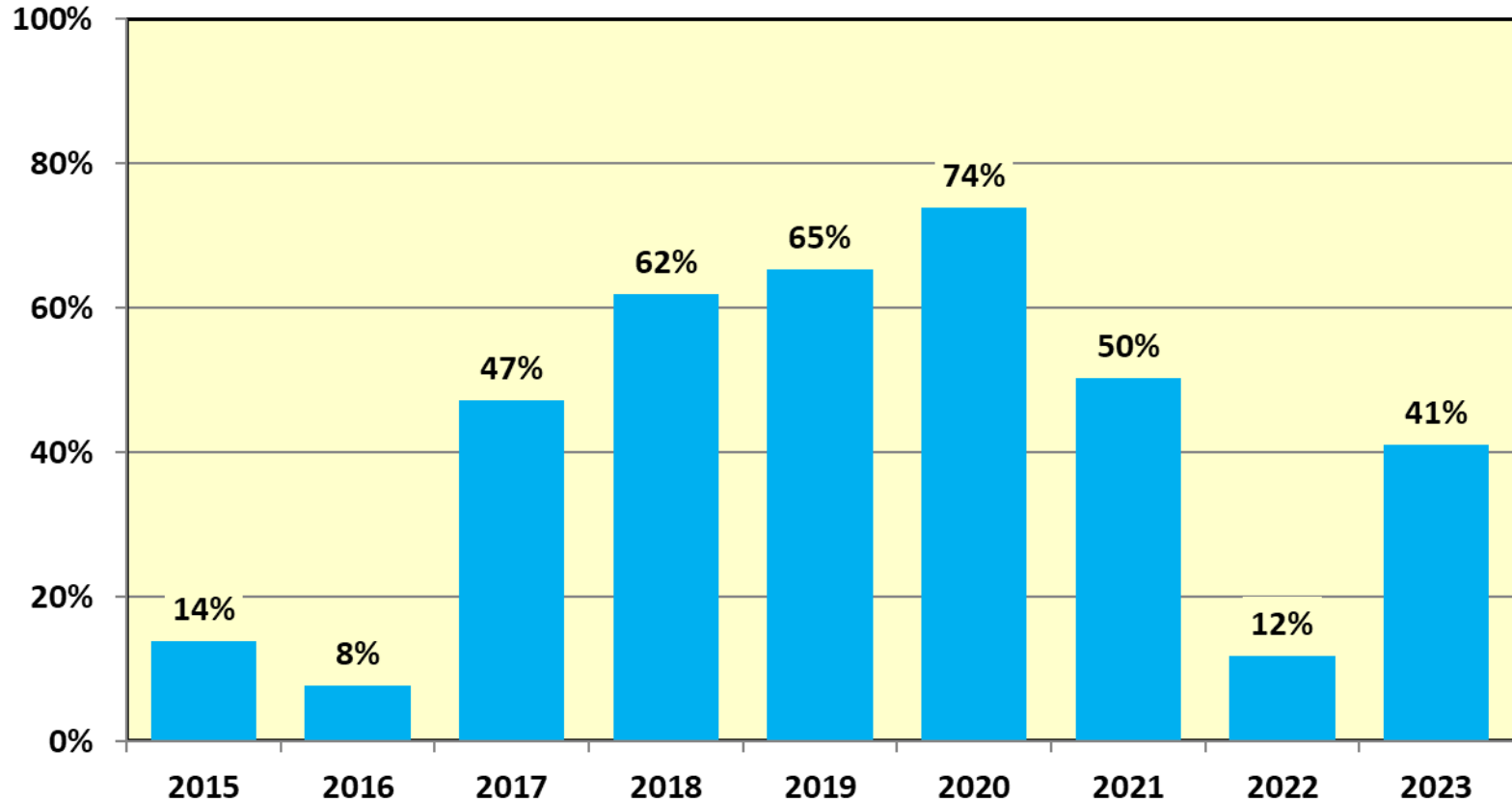
4 218 PAUL in 91 countries



February 2022



percentage of PAUL[®] stations



➡ Note: in 2022 most units were brought to the Ukraine as mobile emergency measure. Thus, number of stations is lower



Credits and awards

PAUL[®] was developed at the

U N I K A S S E L
V E R S I T Ä T

Selected awards won by PAUL[®]

Research was sponsored by



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Winner 2011 in the category „society“

All diagrams presented in this document are presented by
The WaterBackpack Company



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2019 Melvin Jones Fellow

