POLICY STRATEGIES FOR PHARMACEUTICALS IN WATER

Recipharm Environmental Award

28 August 2018

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Outline
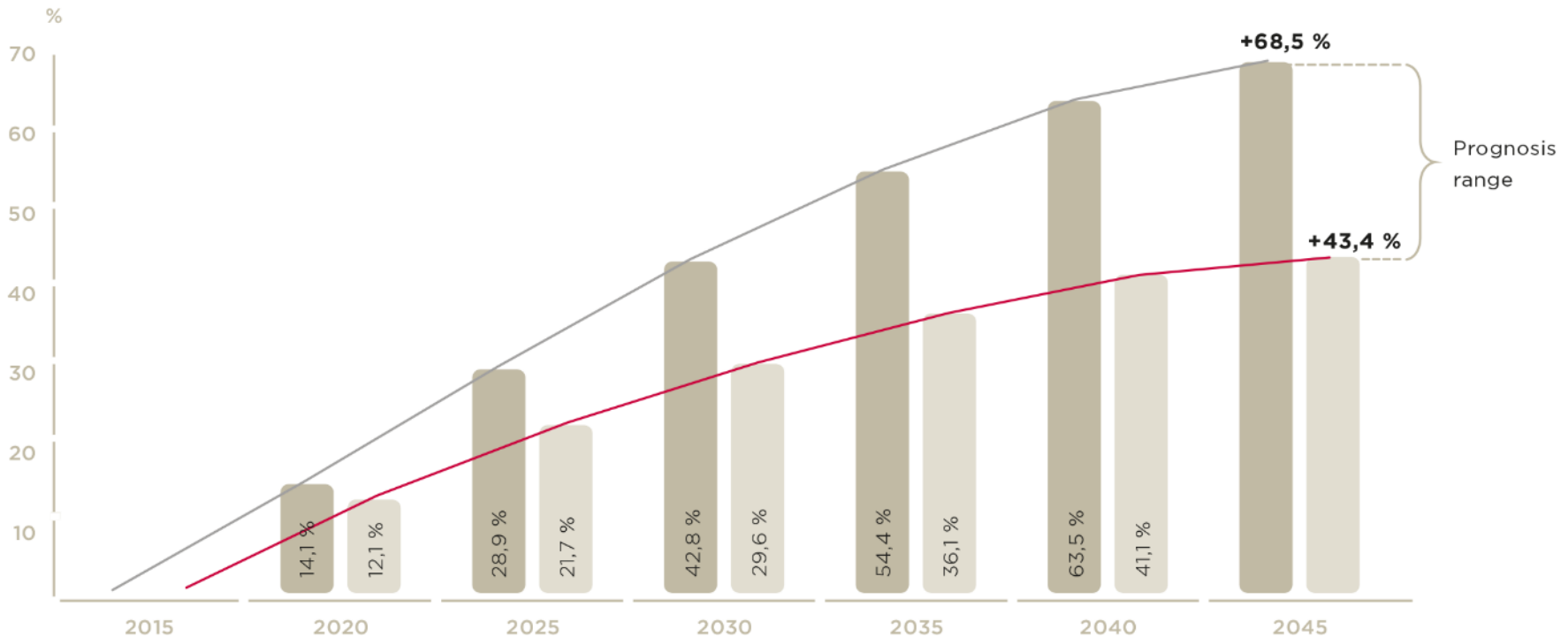
- Why should we be concerned?
- Current management and demands
- Barriers to action
- Case study – Rhine River
- Preliminary policy recommendations
- Questions for discussion

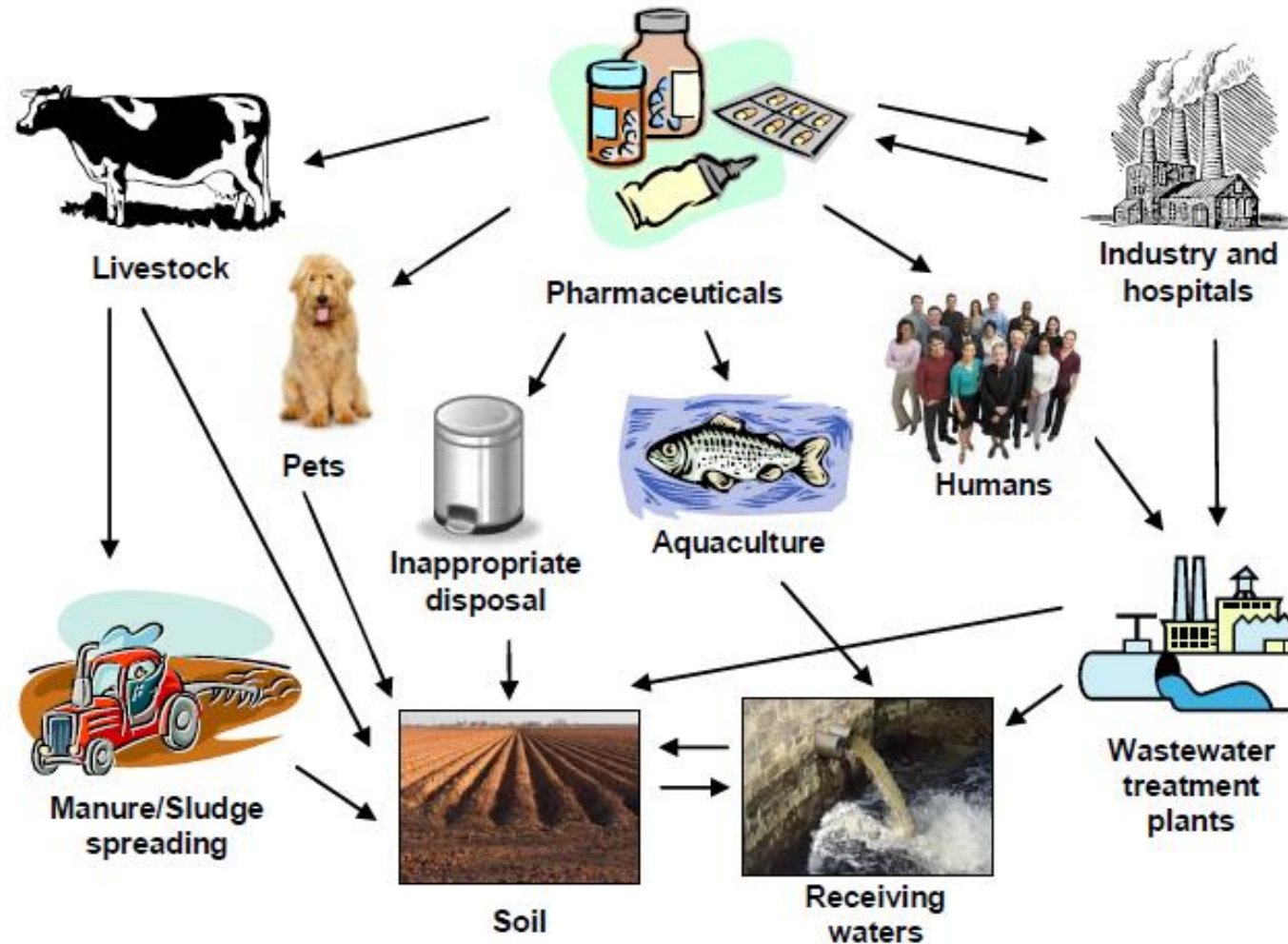# The use of pharmaceuticals is growing

Prognosis range

+68,5 %

+43,4 %

Year	Upper-end scenario	Lower-end scenario
2020	14,1 %	12,1 %
2025	28,9 %	21,7 %
2030	42,8 %	29,6 %
2035	54,4 %	36,1 %
2040	63,5 %	41,1 %

Upper-end scenario
Lower-end scenario

Source: civity analysis 2017

# Sources of pharmaceuticals in the environment

Source: Boxall, A. B. A. 2004. The environmental side effects of medication - How are human and veterinary medicines in soils and water bodies affecting human and environmental health? *Embo Reports,* 1110-1116.

Why should we be concerned?

- Large knowledge gaps on occurrence and human and ecosystem health impacts (e.g. long-term effects and cocktail effects)
- What we do know:
  - Detection in environment
  - Drinking water health risks may be low
  - Antimicrobial resistance (AMR): a global health crisis
  - Impacts on ecosystems and wildlife
  - Traditional water quality policy regulations inadequate
  - Existing wastewater treatment plants not designed to remove pharmaceuticals
  - Increasing public awareness and expectations for improved drinking water quality and freshwater ecosystems
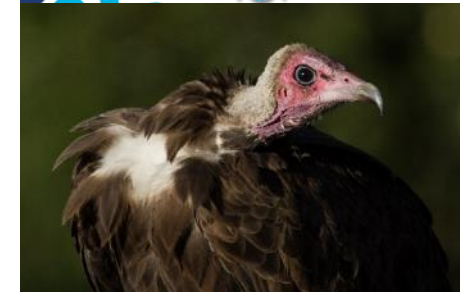
Status quo

- Current mgt: reactive, substance-by-substance, resource intensive, always new substances
- Disconnect between complexity in environment and speed of assessing chemicals > quality of RA needs improvement
- Challenges due to uncertainties
  - Diversity of contaminants, sources, inputs
  - "Unknowns"
  - "Cocktail (mixture) effects"
  - Constant engineering of new pharmaceuticals

> Need to commit to action, accepting some uncertainties

Demands on policy solutions

- Flexibility to adjust to new knowledge
- Ability to deal with uncertainties
- Coordination between multiple levels of government (utilities, regulators, regional and central government)
- Integration of policy sectors (environmental protection, chemical, agricultural, human health)
- Coordination across political boundaries

Barriers to action (OECD questionnaire results)

- Cost and lack of available resources
- Knowledge-related barriers
  - Lack of robust evidence / poor understanding
  - Lack of systematic approach for risk assessment
- Legislative barriers
  - Lack of framework to develop legislation
  - Legislation not flexible
  - Lack of control of internet purchases
- Reluctance to apply the Polluter Pays Principle
- Resistance from industry
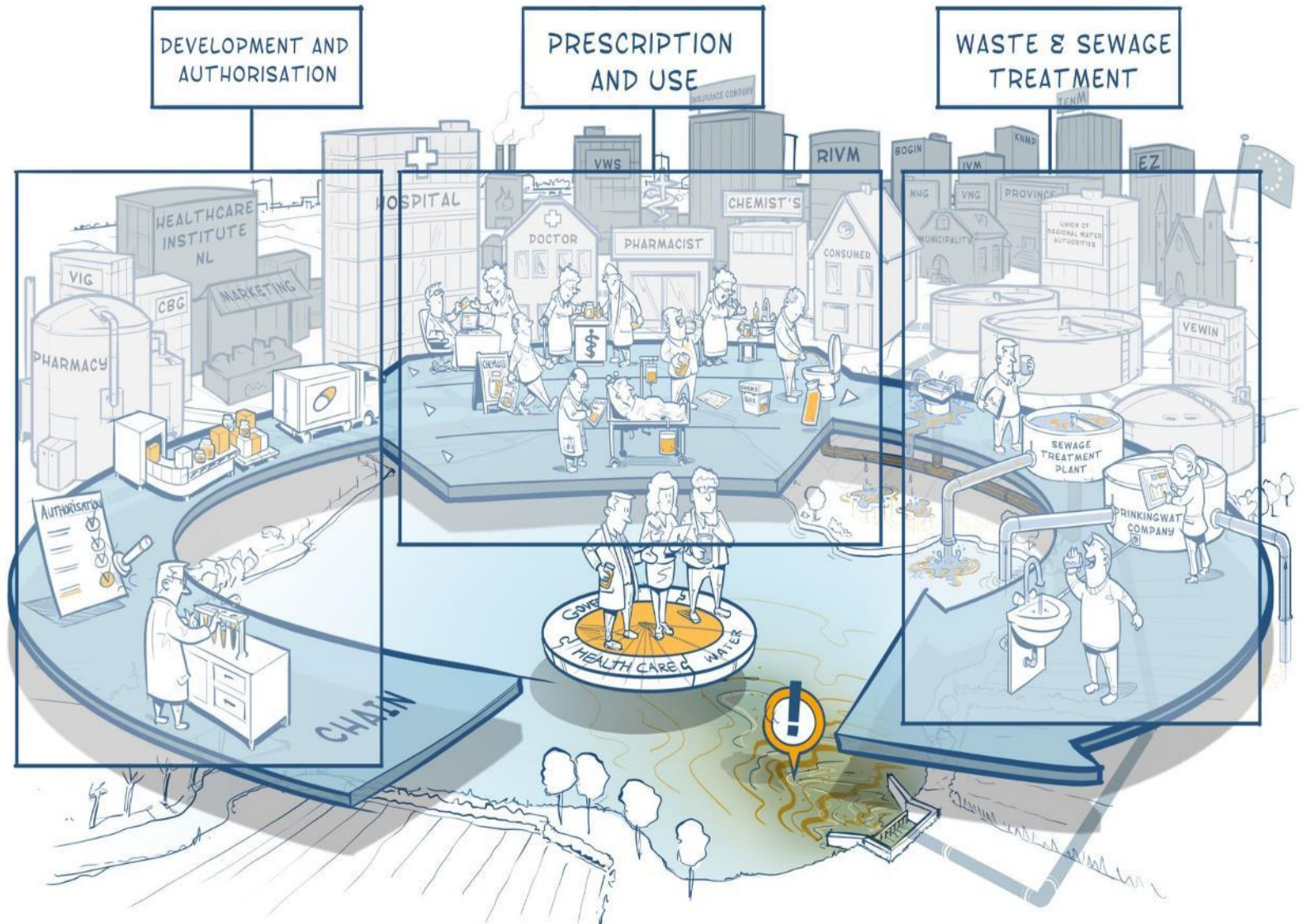
An uncoordinated approach – The Rhine River

- France – monitoring and reporting
- Germany – monitoring and reporting
- The Netherlands – voluntary measures to reduce and treat pharmaceuticals.

- Switzerland – technical standard for WWTPs, wastewater effluent charge, subsidies for technical upgrades of 100 WWTPs (ca. €1 billion)
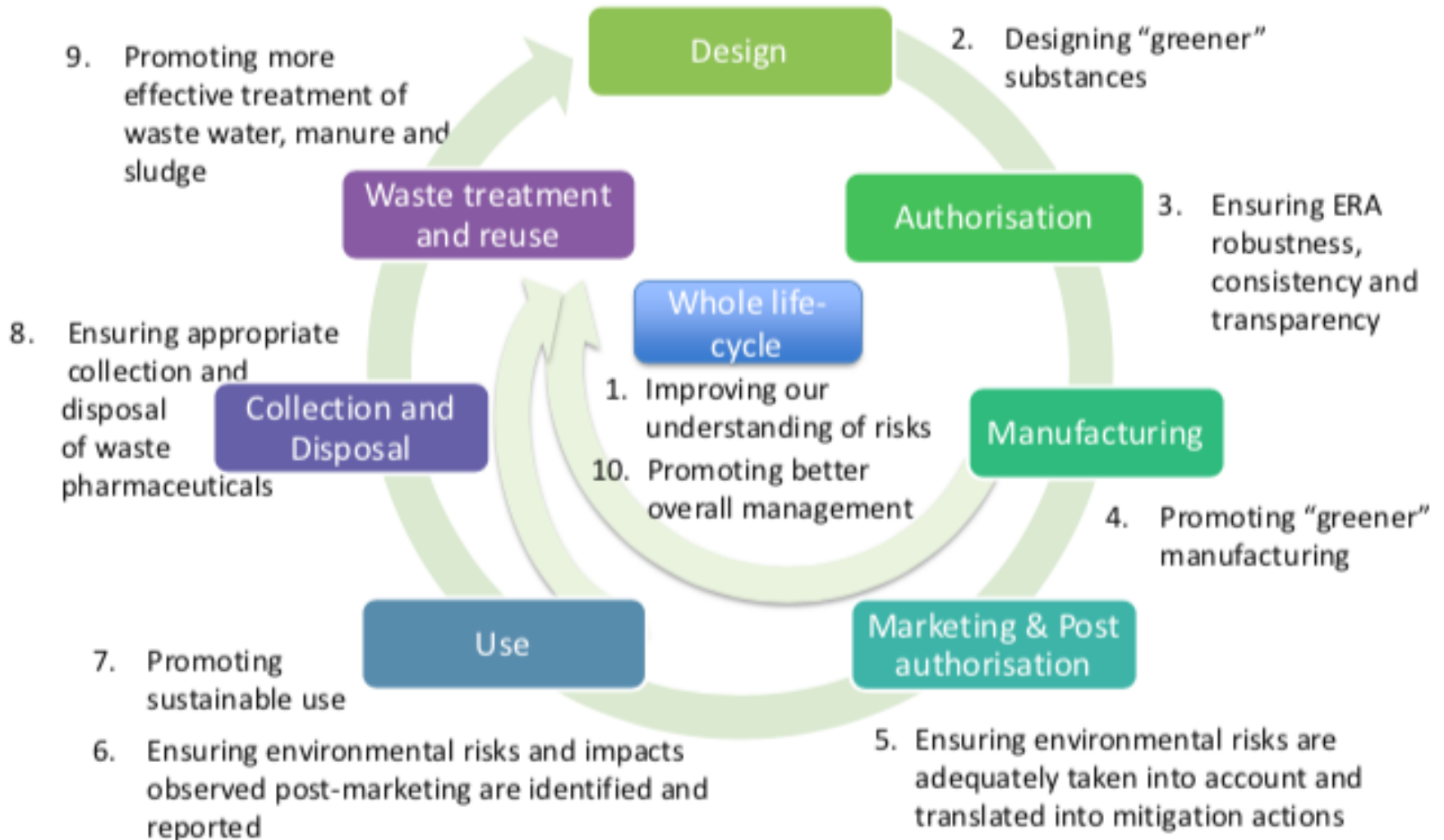
A whole-of-chain approach, Netherlands

Ten action areas across the life cycle of pharmaceuticals

Preliminary policy recommendations (1)

- Solely implementing end-of-pipe measures in the water industry falls short

- Holistic approach/strategy involving all stakeholders is necessary

- Voluntary participation will not deliver – need market and regulatory drivers

- Adaptive management, publically available information – cope w uncertainties

- Need for data sharing, uptake of new monitoring methods and decision-support tools.

- Pay attention to diffuse pollution sources

- Focus on hotspots: environmental monitoring and regulation

- Take action to reduce impacts as much as reasonably possible throughout the pharmaceutical chain

Preliminary policy recommendations (2)

- Expand monitoring, fill knowledge gaps and prioritise pharmaceuticals

- Environmental health risk assessment in authorisation, and post-authorisation for at-risk pharmaceuticals

- Develop drinking water safety plans, monitoring programmes and incidence reporting

- Engage with health professionals to raise awareness of the environmental impacts

- Educate and engage with the public to manage perceived and actual risks, and raise awareness regarding appropriate disposal

- Factor in financing measures for upgrades and O&M of WWTPs, policy transactions costs and the capacity of government officials and stakeholders to implement policies.

Preliminary policy recommendations (3)

- Prevent spread of infection with basic sanitation, wastewater treatment, quality drinking water and hygiene
- Reduce unnecessary use and release of antibiotics
- Ban antibiotics as growth inhibitors in the livestock and aquaculture sectors
- Reduce self-prescription and illegal sales of pharmaceuticals
- Reduce unknowns on relationships between pharmaceuticals, and human and environmental health

For discussion

- What are the future research priorities?
- What policy responses can reduce pharmaceuticals at lowest cost to society?
- Who should pay for the cost of pollution and how should this be characterised?
- How do we deal with decision-making under the uncertainty surrounding pharmaceuticals in the environment?
- Can green pharmacy give us hope?

Thank you

http://www.oecd.org/water

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