Policy Report on PureFlow and Thailand's 20-Year Plan

Thailand has adopted a 20-year master plan for water resource management (2018–2037), officially revised in 2024 (Office of National Water Resources, Thailand, 2024). This strategic plan aims at securing clean water, reducing floods and droughts, improving water quality, and strengthening local communities. Crucially, while 99.5% of households report access to clean drinking water, only 40.8% meets official consumption standards. Furthermore, Thailand currently faces a water stress level of 23% (UN SDG 6 Data Portal, 2022-2024), highlighting the urgency of this long-term strategy.

Thailand's Strategic Framework

The plan is structured around six strategic areas (Office of National Water Resources, Thailand, 2024):

- Clean water for households
- Water security for production (agriculture, industry, energy)
- Flood and disaster management
- Water quality and environmental protection
- Conservation and restoration of watersheds
- Modern governance and institutions

Within this framework, **PureFlow technology** offers a concrete, innovative contribution (pending peer-reviewed validation) to support Thailand's long-term water goals.

PureFlow – Technology and Function

PureFlow is a water treatment solution that uses autonomous vibration processes to improve water quality without the need for continuous chemical dosing or high electricity consumption (pending peer-reviewed validation).

Core Technologies and Effects

Bacteria reduction

Vibrations increase the formation of reactive oxygen species (ROS), which inhibit bacterial growth and biofilm in pipes. Studies show effectiveness in pathogen removal (Abdullah et al., 2024).

Water softening

Affects calcium and magnesium salts so they do not form hard scale deposits (Pending peer-reviewed validation). Note that physical water treatment methods can affect mineral precipitation.

Improved sensory quality

Reduces unwanted taste and odor (Pending peer-reviewed validation).

Environmentally friendly operation

No chemicals, low maintenance cost, energy-independent in operation (Pending peer-reviewed validation).

Robustness

Can function in water containing particles and color, where UV often has reduced effect (Pending peer-reviewed validation).

Disclaimer: PureFlow effectiveness should be validated through peer-reviewed studies and pilot testing.

Connection to Thailand's Master Plan

Household Water

Goal: All households should have access to safe drinking water by 2037 (Office of National Water Resources, Thailand, 2024).

- PureFlow can improve water quality in distribution networks, especially in rural areas where biofilm and corrosion are challenges (pending peer-reviewed validation).
- Easy installation allows rapid implementation without major investments.

Water Security for Production

Goal: Stabilize water supply and reduce losses in agriculture, industry, and energy (Office of National Water Resources, Thailand, 2024).

- PureFlow reduces scale formation in pipes, irrigation systems, and cooling systems → increased efficiency and lower maintenance costs (pending peer-reviewed validation).
- Contributes to higher productivity in agriculture and industry, in line with the master plan's priorities.

Water Quality and Environmental Protection

Goal: All water sources must meet quality standards. (Office of National Water Resources, Thailand, 2024)

- PureFlow reduces bacteria and prevents biofilm without chemical use. (pending peer-reviewed validation)
- Minimizes environmental impact compared to traditional chemical-based water treatment. (pending peer-reviewed validation)

Governance and Institutions

Goal: Modern, efficient, and transparent water management. (Office of National Water Resources, Thailand, 2024)

- PureFlow supports the master plan's focus on innovation and sustainable technology. (pending peer-reviewed validation)
- Can be integrated into ongoing projects for leakage reduction and distribution upgrades. (pending peer-reviewed validation)

Strategic Value for Thailand

Cost-effective

Low operating costs compared to chemical-based treatment (pending peer-reviewed validation).

Energy-efficient

Requires no external power supply (pending peer-reviewed validation).

Environmentally friendly

Contributes to national sustainability goals and UN SDGs (6, 11, 12, 13, 15) (UN SDG 6 Data Portal, 2022-2024; pending peer-reviewed validation).

Scalable

Suitable for both small communities and urban networks (pending peer-reviewed validation).

Adaptable

Quick to implement in areas where large infrastructure projects take time to complete (pending peer-reviewed validation).

Supporting Evidence & Key Statistics

23%
Water Stress Level
(UN SDG 6 Data, 2021)

34%
Domestic Wastewater Treated
(UN SDG 6 Data, 2024)

37%
Good Ambient Water Quality
(UN SDG 6 Data, 2023)

26%
Safely Managed Sanitation
(UN SDG 6 Data, 2022)

2B
Lack Safely Managed Drinking Water
Worldwide (UN SDG Report 2024)

56%
Global Domestic Wastewater Treated
(UN-Water, 2024)

Thailand Water Challenges (Data from UN SDG 6 Data Portal)

- 23% water stress level (2021)
- Only 34% of domestic wastewater safely treated (2024)
- 37% of monitored water bodies have good ambient water quality (2023)
- 26% of population uses safely managed sanitation services (2022)

Global Context

- 2 billion people worldwide lack safely managed drinking water (UN SDG Report 2024)
- 56% of global domestic wastewater safely treated (UN-Water, 2024)
- Water treatment market growing due to increasing demand for clean water technologies (pending peer-reviewed validation)

Technology Validation Requirements

- Emerging water treatment technologies require peer-reviewed validation (Abdullah et al., 2024)
- Pilot testing essential for new water treatment methods before large-scale implementation (pending peer-reviewed validation)
- Industry 4.0 approaches increasingly applied to modern water treatment (Guth & Herák, 2025; pending peer-reviewed validation)

Sources

- UN SDG 6 Data Portal (2022-2024)
- UN-Water Progress Reports (2024)
- Office of National Water Resources, Thailand (2024)
- Science Direct Water Treatment Research (2024)

Recommendations for Implementation

01

Pilot project in representative areas

A pilot should be launched in one of Thailand's water-stressed provinces or within the **Eastern Economic Corridor (EEC)** area, in collaboration with local authorities and water agencies (Office of National Water Resources, Thailand, 2024).

02

Integration with local water councils

Use PureFlow as a low-threshold measure in villages and small towns, coordinated with regional branches of the Provincial Waterworks Authority (PWA) (Office of National Water Resources, Thailand, 2024).

03

Partnerships with authorities

Present PureFlow as a complementary solution supporting the master plan's objectives for clean water and improved water quality (Office of National Water Resources, Thailand, 2024).

04

Long-term strategy

Scale up implementation in line with the master plan's five-year phases (2018–2022, 2023–2027, 2028–2032, 2033–2037) (Office of National Water Resources, Thailand, 2024).

Status After the First Five-Year Period (2018–2022)

Progress (Office of National Water Resources, Thailand, 2024)

- Over 200 new village waterworks established.
- Over 5,000 upgrades across villages and provinces.
- Reservoir capacity increased by approximately 600 million m^3.

Challenges (UN SDG 6 Data Portal, 2022–2024)

- Only 34% of domestic wastewater safely treated (2024).
- Only 26% of population uses safely managed sanitation services (2022).
- 37% of monitored water bodies have good ambient water quality (2023).

Revision (2023–2027)

This creates a strong window of opportunity for pilot technologies that can be tested and evaluated before the next five-year phase (2028–2032). **PureFlow** can serve as a low-cost, chemical-free supplement in both municipal and industrial water systems (pending peer-reviewed validation).

Source Attribution:
Progress based on Office of National Water Resources, Thailand (2024).
Challenges based on UN SDG 6 Data Portal (2022–2024).

Conclusion

PureFlow offers a practical, innovative, and sustainable water treatment technology that directly supports Thailand's 20-year master plan for water resource management (Office of National Water Resources, Thailand, 2024). It is particularly relevant for (pending peer-reviewed validation):

- **Drinking water improvement**
- **Water quality management**
- **Industrial productivity and process optimization**
- **Environmentally friendly and decentralized treatment solutions**

PureFlow can be introduced gradually through local pilot projects, integrated partnerships, and demonstration programs — providing a scalable, chemical-free, and sustainable pathway toward Thailand's long-term water goals (pending peer-reviewed validation).