

Water Consumption

Currently, Thailand and other parts of the world are facing water related issues, such as flooding, drought, poor water quality, inadequate supply, and stakeholder conflicts caused by water withdrawal and consumption. Water management and sanitation is set as the SDG 6 aiming to ensure adequate water supply and sustainable water management for everyone. Bangchak, as one in the energy industry consuming high quantity of water, recognizes the importance of water management as well as the increase in efficiency improvement of water consumption. Therefore, the company set targets for the reduction and control of new water withdrawal, including water management through the use of innovative tools and technology. In addition, the company uses Water Stress Index (WSI) of 25 Watersheds level in Thailand and the world class WSI(1) to assess the water scarcity footprint of the company’s products. The WSI from water resources that the company used is tap water, which was brought to consideration in the assessment. The 2019 average of WSI from Chao Praya River Basin was 0.339 or at the moderate stress. Moreover, the company has begun to review guidelines for evaluating water-related risks with tools, such as Water Scarcity Footprint in accordance with the ISO14046 guidelines. As regard to the cooperation with external organizations to solve the issues of water consumption, the company also formed a Community of Practice (CoP) to share experiences and discuss water issues through CoP Knowledge Sharing with external organizations to find proactive ways to overcome water issues and to reduce impacts on the nation from water consumption.

<h3 style="margin: 0;">Strategies</h3> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="text-align: left;"> <p style="margin: 0; color: white;">Use the 3Rs (Reduce, Reuse & Recycle) principle to increase efficiency of water reduction, water reuse and water recycling</p> </div> </div> <hr style="width: 80%; margin: 10px 0;"/> <div style="display: flex; align-items: center;">  <div style="text-align: left;"> <p style="margin: 0; color: white;">Water management with innovative tools and technologies</p> </div> </div> </div>	<h3 style="margin: 0;">2019 Targets</h3> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="text-align: left;"> <p style="margin: 0;">Use water efficiently to control the new water intake in the production process with no more than 56.6 cubic meters per thousand barrels equivalent to the production unit</p> </div> </div> <hr style="width: 80%; margin: 10px 0;"/> <div style="display: flex; align-items: center;">  <div style="text-align: left;"> <p style="margin: 0;">Reducing water withdrawal by 15%, equivalent to base year 2015</p> </div> </div> </div>
--	---

2019 Performance

Bangchak used 2.47 million cubic meters of tap water from the Metropolitan Waterworks Authority and 27,667 cubic meters of groundwater as a part of the management plan to reduce the use of tap water during the drought. The company also used 195,187 cubic meter of river water from Chao Phraya River as reserved water for tank maintenance, testing fire extinguisher equipment and annual rehearsal of emergency plan. In 2019, the company withdrew water totaling 2.69 million cubic meters (Disclosure 303-1), equivalent to 0.065 cubic meters per barrel of oil produced. This was an increase from last year at 0.0027 cubic meters per barrel equivalent to oil production. The overall water volume had increased because of the use of ground water. Furthermore, the number of oil tanks for maintenance increased compared to the previous years. The company was able to discharge 1.66 million cubic meters into surface water. The amount of water used for the production process is 1.03 million cubic meters or 24.9 cubic meters per thousand barrels of oil equivalent.

However, the company continues to implement the 3Rs continuously to reduce water consumption and to reduce wastewater to the public. These measures helped reduce the total water consumption by 1.21 million cubic meters or 31.01 % of total water use. The implementation was done through the following projects (Disclosure 303-3):

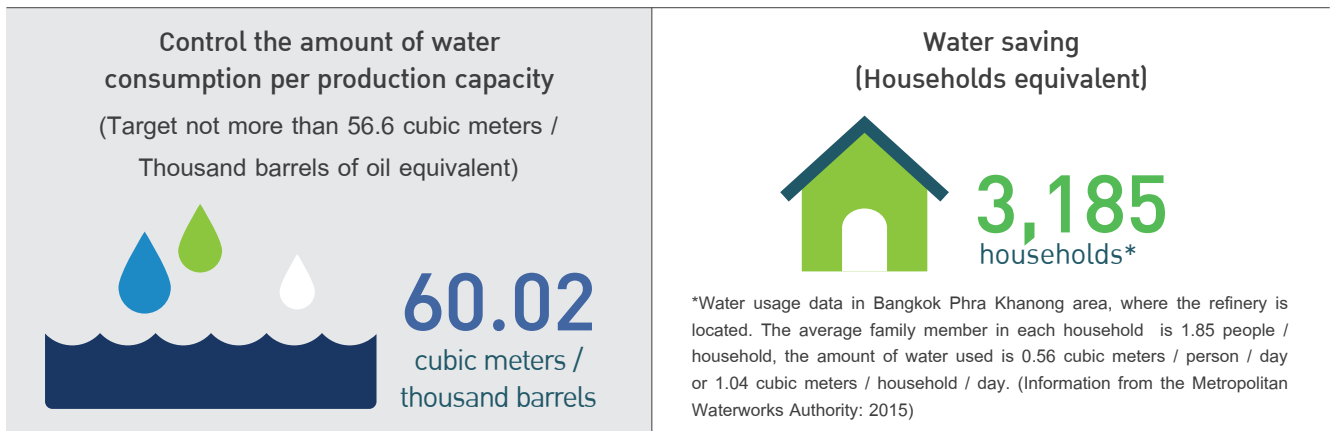


Bangchak is the first refinery in Thailand to receive the Water Footprint of Products certificates.

⁽¹⁾ Based on the WSI database of Pfister et al. (2009)

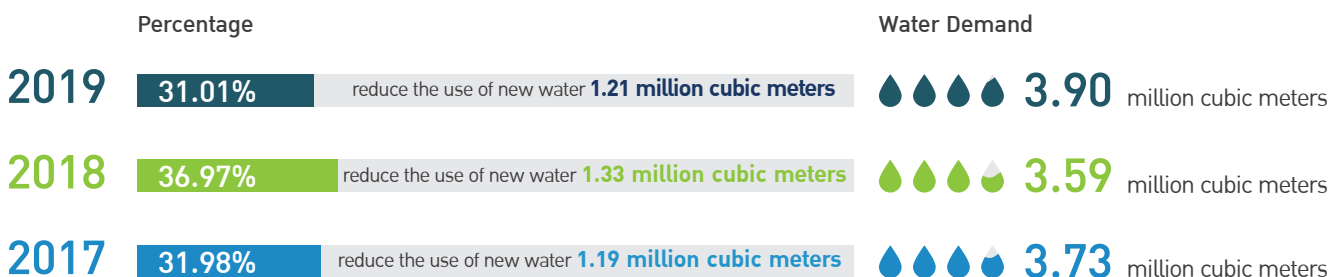
No.	2019 Action Plans	Results
Water Reduction		
1	Use the process to improve the quality of tap water by micron level fine filtering system. (Micro-filtration System) and Reverse Osmosis System together with water quality units with Reverse Osmosis System and Electro De- Ionization System) to improve raw water quality before entering into the demineralized water production system. (Demineralization System) at the Power Plant.	Reduced water consumption by 50,650 cubic meters / year * (1.30% of total water demand and 1,223 cubic meters per million barrels of oil equivalent)
Water Reuse		
2	Use good quality condensate water from the production process instead of water for steam boilers	Reduced water consumption by 546,122 cubic meters / year (14.01% of total water demand and 13,183 cubic meters per million barrels of oil equivalent)
3	Take the Stripped Water from the Sour Water Stripping Unit and the Stripping Steam wastewater of the 3rd distillation unit instead of water supply in the salt removal unit from crude oil (Desalter)	Reduced water consumption by 87,317 cubic meters / year (2.24% of total water demand and 2,108 cubic meters per million barrels of oil equivalent)
Water Recycle		
4	Use slightly contaminated condensate water from the refining unit plant 4 to improve the quality of condensate water for the reuse in Boiler Feed Water	Reduced water consumption by 353,038 cubic meters / year (9.05% of total water demand and 8,522 cubic meters per million barrels of oil equivalent)
5	Improve the quality of treated water from the wastewater treatment unit through the micro-filtration system and reverse osmosis system which are the very fine filtering systems to micro level for the reuse in cooling process	Reduced water consumption by 172,141 cubic meters / year (4.41% of total water demand and 4,155 cubic meters per million barrels of oil equivalent)

Success Indicators



Percentage of new water usage reduction compared to water demand in that year

(Percentage and amount of water that can be reduced)



*Compared to baseline year 2015 from reusing condensate water in boilers and the 4 refinery unit plus treated water from oil treatment unit using RO, and include treated water from wastewater treatment units using RO for cooling towers