



Xylem Global Student Innovation Challenge



WATER

impacts our lives every day, from meeting our personal needs to influencing the global economy and the well being of our planet. Factors like climate change, pollution and aging infrastructure threaten global water supplies and water security.

Xylem is a leading water technology company committed to "solving water" by creating innovative and smart technology solutions to meet the world's water, wastewater and energy needs.



Reducing the Water Footprint of Everyday Products

CHALLENGE STATEMENT

Many of us have never considered how much water is used to produce everyday products. Consider this: what water footprint does your favorite product leave behind? How much water is involved in the process, production and creation of these items? Are your favorite products created with water conservation or sustainability in mind?

1. Analyze the life-cycle water consumption, including the sourcing, manufacturing, production, and marketing processes, for one of the following consumer products:
 - a) Smartphone
 - b) Leather bag or shoes
 - c) Electric car
 - d) A product of your choice
2. Develop a solution to reduce the water footprint of the selected product, or one of its components.
3. Analyze the benefits of your solutions to the consumer, manufacturer, seller, and community.



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PAIN POINTS

- Some of the most water-intensive processes required to create both smartphones and electric vehicles are semiconductor manufacturing, etching of microchips, and mining-related processes for electronic components.
- Smartphones are a critical part of global e-waste problems, with less than 20 percent of broken or retired phones being recycled.
- The rare materials used in electric car batteries and electronic systems mean that their supply chains are much more global than typical internal combustion engine cars.
- The cattle industry, including meat, dairy and leather-producing cattle, shares many challenges with the wider livestock industry. Waste & effluent water is generated from fields – taking time to manage and money to treat, clean or remove. Environment factors such as sewers, yard floods, overflowing tanks, air pollution, pest infestations, and local complainants can also hinder livestock operations.
- Leather tanning requires large amounts of water to facilitate steps from treating raw hides, to dyeing and conditioning leather. When efforts are made to reduce water use, the concentration of chemicals in water can increase, causing more dangerous working conditions and pollution and requiring complicated treatment processes.



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OPPORTUNITY AREAS

- Many smartphone and component manufacturers, including Apple, Intel and more, have pledged to become water neutral in the coming decades. That means the support and investment is there, but new innovations are still needed to help achieve that goal.
- Cattle farmers are always seeking to achieve less downtime, more production made, better control of their facility and a more consistent leather product being made, while minimizing waste. Recycling wastewater is a key area of investment to reduce costs in the industry. Wastewater needs to be treated to ensure local consents are adhered to.
- In general, manufacturing processes often have the biggest impact on their local community. How much water are they using, and what are the effects of factories, waste and wastewater on the community? In some cases, water management practices that are successful in one place may only need to be transferred to other communities.
- Downtime in manufacturing processes results from inefficient or old equipment - and downtime can result in wasted water and energy. Smarter technologies can give greater visibility to how equipment is operating, the quality of the process water or wastewater, and create more optimized operations. Where is there opportunity to use “smart” tools to improve process water use?



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GENERAL NOTES

- There are a lot of factors that contribute to a product's water footprint! In your solution, we encourage you to focus on a single problem. Innovation doesn't have to solve every single problem at once!
- Is there a company or factory in your community? Consider reaching out to companies or organizations that could give you more information about a specific water management challenge they face!

RESOURCES AND DATA

There are a number of publications and websites about current challenges in product water sustainability. Here are a few to get started:

- Sustainability in Xylem Operations ([Link 1](#))
- Cleaning up electronic waste (e-waste) ([Link 2](#))
- Water usage in leather tanneries ([Link 3](#))
- Environmental cost of electric car batteries ([Link 4](#))