



Draft EIS Advice for SOPA DA Submission

Urbn Surf (Sydney) - Wave Park Group

11 April 2017

Summary

- The SOPA Design Review process indicated a preference for the environmental credentials of the Urbn Surf (Sydney) proposal to be validated by an established “rating tool” such as Green Star or One Planet Living.
- Presently, there isn’t a comparable sustainability benchmark for wave pools in Australia. This presents an opportunity for Urbn Surf (Sydney) to set the sustainability standard for wave pool facilities and the broader commercial recreational industry in Australia. Kinesis has been engaged to understand the energy and water demands the facility will have on Sydney and recommend best practice sustainability measures.
- Kinesis were asked to independently review the technical reports and draft submission material provided by Urbn Surf (Sydney) to establish a clear benchmark of its sustainability performance and suggested mitigation strategies. The core of our brief was to:
 - Perform an evaluation of the environmental performance (energy + water) of the proposal.
 - Make recommendations for improved performance compared to BAU.
 - Make recommendations for a response to the concerns relating to SOPA Design Panel questions.
- In simple terms the annual resource demand of the wave pool (excluding facilities) is estimated to be:
 - Energy: Equivalent to the electricity demand of 600 homes in the same area or heating a similar sized aquatic centre.
 - Water: Evaporation losses are equivalent to the consumption of 200 homes in the same area.
- The resource demands of the on-site facilities are a small fraction of the wave park itself and can be easily mitigated from connecting to the recycled water scheme and the collecting rainwater from roofs in addition to installing an appropriately sized solar array.
- On the energy side, Kinesis recommends ensuring efficient thermal performance of the building fabric, installing energy efficient lighting and efficient space conditioning for the on-site facilities. The proposed 100 kW solar PV array would supply 35% of the on-site facilities and wave pool lighting energy demand. This would be considered best practice when benchmarked against most non-residential facilities.
- Urbn Surf (Sydney) should enter green power purchase agreements to meet the remainder of Urbn Surf (Sydney)’s on-site facilities and wave pool’s energy demand to achieve carbon neutrality.
- Evaporation and other water losses from the wave pool account for 83% of the facility’s total water demand. Only 32% of these losses are replenished with rainfall. Non-potable water is, however, used exhaustively to satisfy 76% of the on-site facilities and irrigation water demand.
- Urbn Surf (Sydney) should aim to be carbon and water neutral by 2025. Kinesis recommends engaging a private utility service provider to help Urbn Surf (Sydney) achieve this target.

Energy analysis

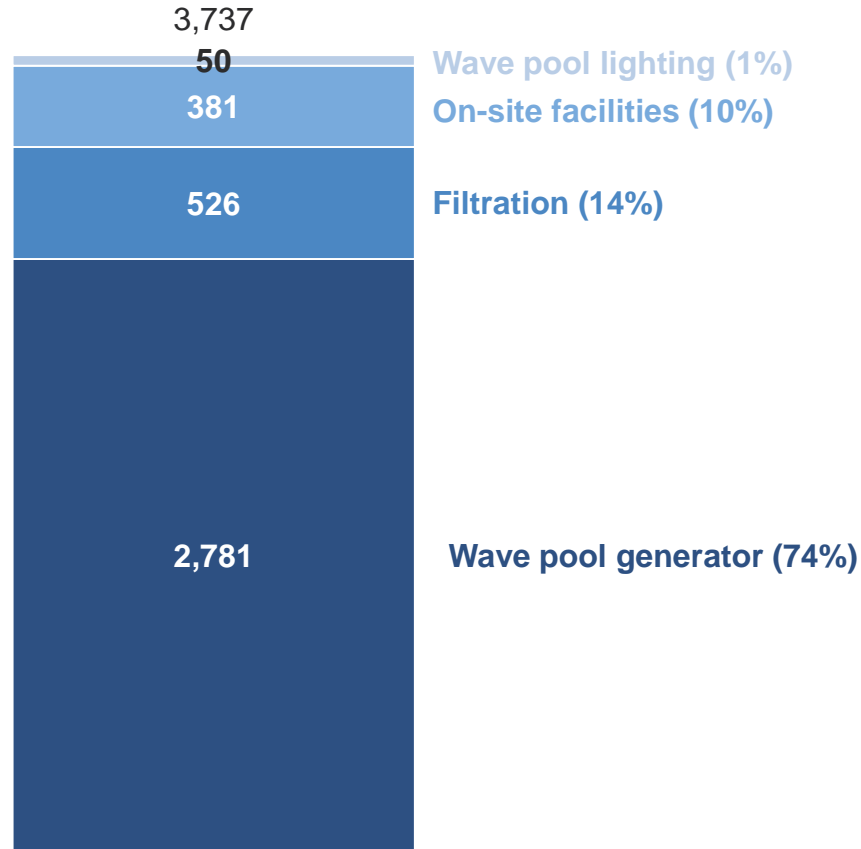
Energy Analysis

- The energy analysis was undertaken based on figures provided by Urbn Surf (Sydney) using Kinesis' CCAP Precinct modelling tool. CCAP Precinct is a land use and planning tool that models key environmental, economic, social and infrastructure implications and requirements for precinct-scale development projects.
- Allowing for different occupancy rates and usage patterns to traditional commercial facilities, the modelled energy demand for the on-site facilities were comparable to figures that Urbn Surf (Sydney) provided and as such, we have used Urbn Surf (Sydney)'s figures as the "source of truth".
- To satisfy SOPA's demand it might be appropriate to respond with a "worlds best practice" approach to establishing Urbn Surf (Sydney)'s environmental credentials.
- For the purpose of simplifying our response, the on-site facilities (including wave pool lighting) and the wave pool were considered as two separate entities in the Urbn Surf (Sydney) park. Kinesis has developed recommendations for each of them:
- **On-site facilities (including wave pool lighting)**
 - The energy demands of the on-site facilities and wave pool lighting are a small fraction (11%) of the proposed wave park (See page 5).
 - The application of best practice thermal performance for the building fabric, installing energy efficient lighting and efficient space conditioning for the on-site facilities would reduce the electricity demand of the facilities by approximately 15%. This would lead to an average energy intensity of 150 kWh per m2 per year which is readily achievable with current design and technology options available.
 - The proposed 100kW solar PV array would then supply approximately 35% of the on-site facilities' and wave pool lighting's energy demand. This would be considered best practice when benchmarked against most non-residential facilities.
- **Wave Pool**
 - Nearly 90% of the facility's energy demand is from the operation and maintenance of the wave pool. In simple terms, the annual energy demand of the wave park itself (excluding facilities) is estimated to be the equivalent of the electricity demand of 600 homes in the same area or heating an aquatic centre of the same size.
 - Urbn Surf (Sydney) should enter green power purchase agreements to supply the remainder of Urbn Surf (Sydney)'s on-site facilities and wave pool's energy demand.
 - Our advice would be to stage this "offset" approach so that you are carbon neutral by 2025. This could only be deemed as leading industry practice and would more than favourably compare to Australia's leading property companies. We think this would be a cost effective approach given the leverage you would achieve on your total retail energy consumption.
 - Additionally, Urbn Surf (Sydney) should consider a collaboration or a commercial agreement with a private utility or sophisticated embedded network provider to establish all of the above off their own balance sheet.

Facility on-site facilities and wave pool lighting contribute to 11% of UrbnSurf Sydney's total electricity demand.

URBNSURF (SYDNEY) PROJECTED ANNUAL ENERGY DEMAND

MWh per annum



Operating just the wave generator + filtration is equivalent to the electricity demand of approximately 600 homes in the Sydney Olympic Park region or heating a similar sized aquatic centre.

Projected annual energy demand

Kinesis recommends improving the thermal performance of the on-site facilities, install efficient lighting and space conditioning measures and entering green power purchase agreements

MAKING URBN SURF (SYDNEY) CARBON NEUTRAL

- The energy demand for Urbn Surf (Sydney)'s on-site facilities including wave pool lighting is estimated at **431 MWh per annum**.
- This is comparable to what Kinesis models for similar non-residential buildings to meet the National Construction Code.
- Applying improved thermal performance of the building fabric, installing energy efficient lighting and efficient space conditioning, the **energy demand** could potentially be **reduced by ~15%**.
- The proposed **100 kW** solar PV array would then be able to supply **over a third of the energy demand**.
- Kinesis recommends entering green power purchase agreements to supply the remainder of the park's energy demand (both on-site facilities and the wave pool) by 2025.
- Implementing this would make Urbn Surf (Sydney) the sustainability benchmark in the commercial recreational industry.

Water analysis

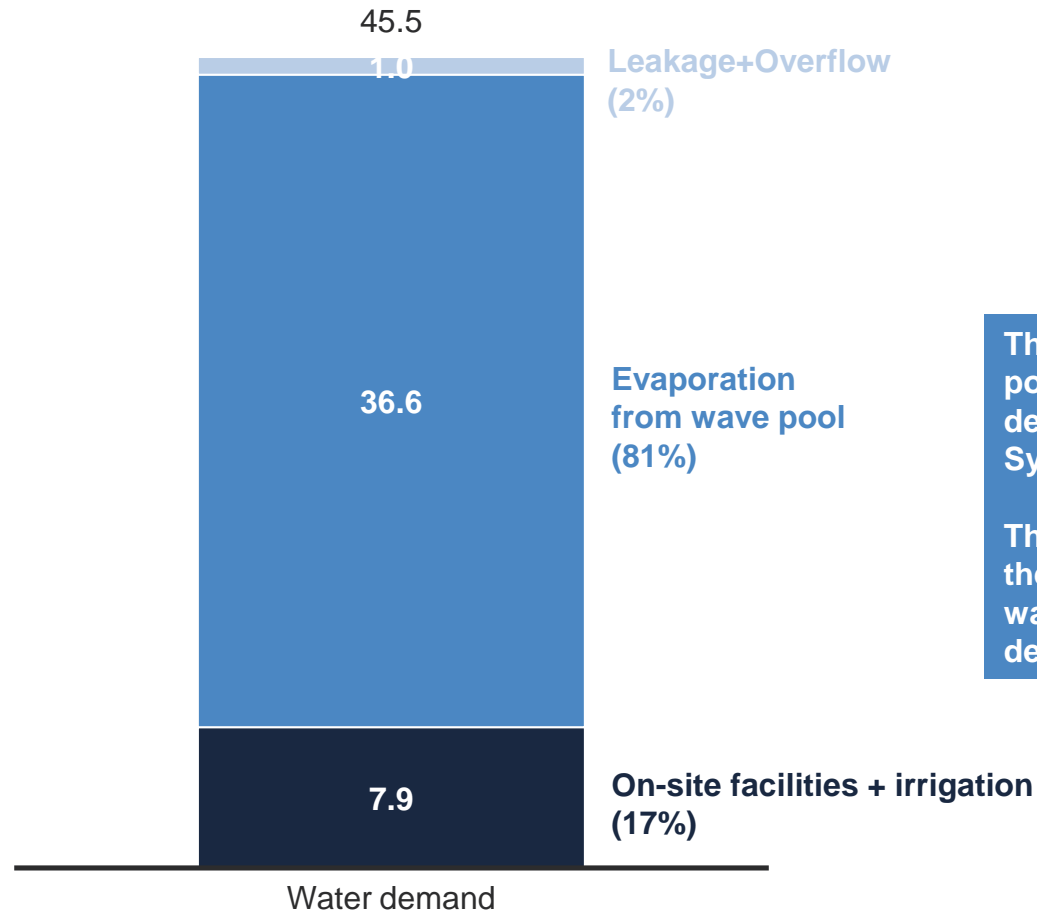
Water Analysis

- The water analysis was, once again, undertaken based on figures provided by Urbn Surf (Sydney) using Kinesis' CCAP Precinct modelling tool. Allowing for different occupancy rates and usage patterns to traditional commercial facilities, the modelled water demand for the on-site facilities and the evaporation losses from the wave pool were comparable to figures that Urbn Surf (Sydney) provided and as such, we have used Urbn Surf (Sydney)'s figures as the “source of truth”.
- To satisfy SOPA's demand it might be appropriate to respond with a “worlds best practice” approach to establishing Urbn Surf (Sydney)'s environmental credentials.
- For the purpose of simplifying our response, the on-site facilities and the wave pool were considered as two separate entities in the park. Kinesis has developed recommendations for each of them:
 - **On-site facilities (including irrigation)**
 - The water demand of the on-site facilities and irrigation is a small fraction (17%) of the proposed wave park (See page 9).
 - More than 75% of this demand is met using rainwater for the toilets and recycled water for irrigation (See page 11).
 - **Wave Pool**
 - Evaporation and other water losses from the wave pool account for 83% of the wave park's demand (See page 9). In simple terms, the annual evaporation and other water losses from the wave pool itself (excluding facilities) is estimated to be the equivalent of the water demand of 200 homes in the adjacent local government area. Thought from a recreational infrastructure lens, the evaporation and other water losses from the wave pool are only about a third of the irrigation demand of a typical golf course.
 - Only 32% of these losses would be replenished through rainwater (See page 11).
 - Our advice would be to plan for future infrastructure upgrades and a future regulatory environment which would allow for additional uses for recycled water.
 - Additionally, Urbn Surf (Sydney) should consider a collaboration or a commercial agreement with a private utility or recycled water system provider to establish all of the above off their own balance sheet.

Evaporation and other losses from the wave pool account for 82% of the total annual water demand from the facility.

URBNSURF (SYDNEY) PROJECTED ANNUAL ON-SITE FACILITIES WATER DEMAND & EVAPORATION LOSS

ML per year



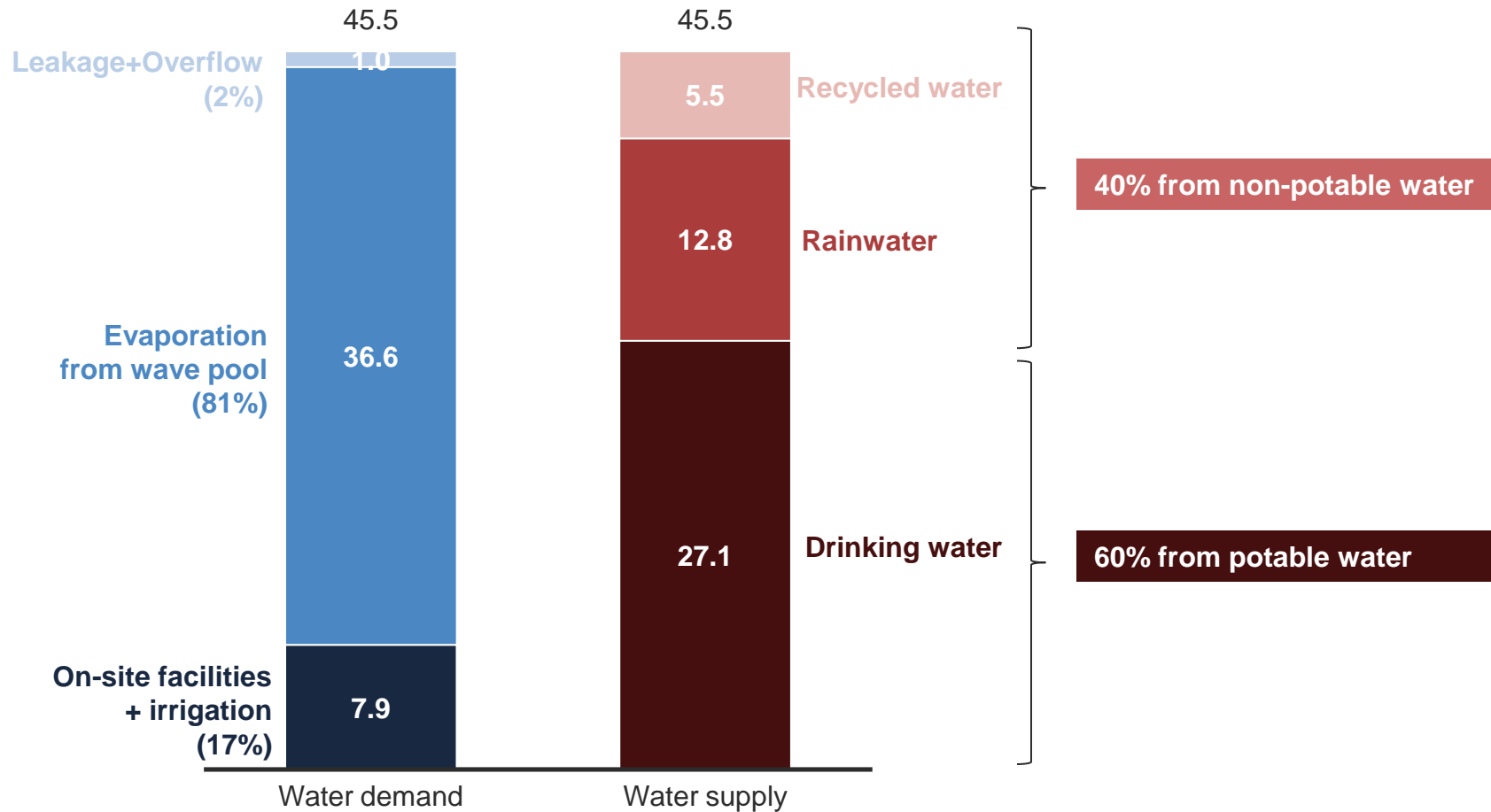
The evaporation and other losses from the wave pool each year is equivalent to the water demand of approximately 200 homes in the Sydney Olympic Park region.

Thought from a recreational infrastructure lens, the evaporation and other water losses from the wave pool are only about a third of the irrigation demand of a typical golf course.

60% of the water demand is met using potable water.

URBNSURF (SYDNEY) PROJECTED ANNUAL on-site facilities WATER DEMAND & EVAPORATION LOSS

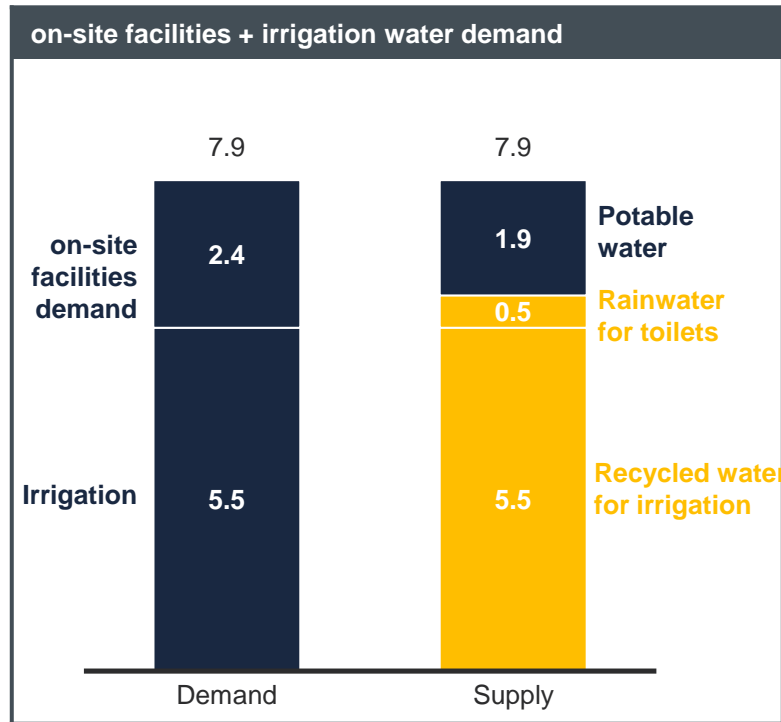
ML per year



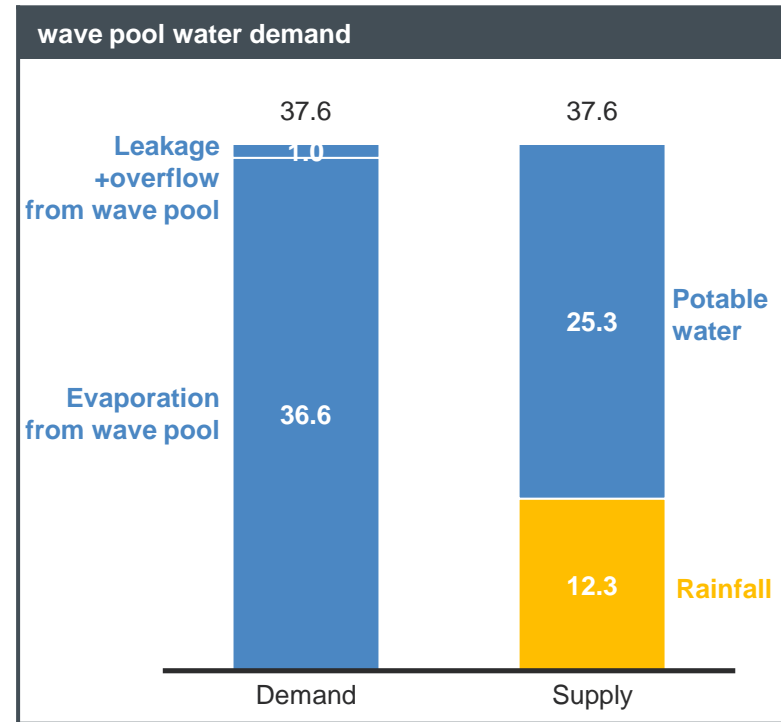
More than 75% of the building and irrigation water demand is met using non-potable water sources. Only 32% of the wave pool's losses are replenished with rainwater.

URBNSURF WATER DEMAND – DRINKING WATER VS RECYCLED WATER

ML per year



76% of the on-site facilities water demand is met using non-potable water sources



Only 32% of the wave pool's losses are replenished with rainfall

If the identified measures are implemented, Urbn Surf (Sydney) can set itself as the sustainability benchmark for wave pools and the broader commercial recreational industry in Australia.

CONCLUSIONS AND NEXT STEPS

- Presently, there isn't a comparable sustainability benchmark for wave pools in Australia. There is an opportunity for Urbn Surf (Sydney) to set the sustainability standard for wave pool facilities and the broader commercial recreational industry in Australia.
- Kinesis recommends ensuring best practice thermal performance of the building fabric, installing energy efficient lighting and efficient space conditioning for the on-site facilities. The proposed 100 kW solar PV array would then supply 35% of the on-site facilities' and wave pool lighting energy demand. This would be considered best practice when benchmarked against most non-residential facilities.
- Evaporation and other losses from the wave pool contributes to 83% of the facility's annual water demand. Only 32% of the loss is replenished using rainwater.
- The facilities are substantially serviced using non-potable water - All the irrigation demand is serviced using recycled water and some rain water is used for toilets.
- Future regulation may permit recycled water (of appropriate quality) to be used for other purposes including the wave pool. Urbn Surf (Sydney) should have the necessary infrastructure in place for such an opportunity.
- Urbn Surf (Sydney) should aim to be completely carbon and water neutral by 2025. This can be achieved through green power purchases and engaging a private utility service provider to operate and maintain the wave generator and filtration system. This would set Urbn Surf (Sydney) as the sustainability benchmark amongst wave pools and the broader commercial recreational industry. As such, its environmental performance would be at par with some of Australia's leading property developers and asset owners typically associated with the use of rating tools.