A Low GHG Desalination/Water re-use Process (Booth 4) (/initiative/4Wy4/a-low-ghg-desalinationwater-re-use-process-booth-4)

Forward osmosis (FO) is a membrane filtration process, mimicking the natural process of osmosis. Trevi Systems Inc. has developed an FO process that relies on a source of low-grade heat. Waste heat, rather than electricity, is used to desalinate. This process is at least 4 times more energy efficient than RO in electricity use. FO differs from RO in that osmotic pressure, resulting from the difference in solute concentration. The uniqueness of Trevi System's FO process is in its use of osmotic pressure as a "driving" force to pass water through a semipermeable membrane.

Submitted by Aneliese Ramsay

Comments

Doug Valby 3w, 6d ago NEUTRAL

No source of waste heat in Santa Cruz. Maybe this could work in Moss Landing...

Jim Mekis 4w ago PRO

Intriguing; desalinization with 90% less energy consumption, and pilot projects are running in both California and overseas. Scalable. Could use either waste water or sea water. Worth exploring further.

Fred Martinez 2w, 6d ago PRO

This is on the right track.

Bill Smallman 3w, 6d ago SUGGESTION

I think the word "Desalination" in the title of this report should be changed to "Reverse Osmosis for Recycle or Desal", and people continue to equate reverse osmosis, RO, with Desal. RO works identically with Recycle or Desal. This article states that only 200-400 psi is needed for Recycle, and a huge 800-1000 psi for Desal. Recycle will always use far less energy, less cost than Desal, simply because it has far less chemicals to filter out- no matter what technology is used.

Bill Smallman 3w, 5d ago

I'd like to correct myself. It does include water reuse, i.e. recycling, in the title. I do think however a lot of people feel the technology is solely associated with Desal, and that is the reason why I wanted to point this out.

Michael Lewis 3w, 6d ago NEUTRAL

Could be considered as a technology for waste water recycling.

Colin Young 3w, 5d ago CON

Trevi's claim of half the cost of RO with their FO is still over twice the cost needed for consideration.

Terry McKinney 2w, 6d ago NEUTRAL

Should be looked at for Reclaim Water

Alan K Miller 1w, 6d ago SUGGESTION

If one looks at Trevi's material at the link provided at the SCWS Alternatives site, at first glance Trevi Forward Osmosis sounds like a good alternative. That was my initial reaction. But if one digs deeper into the history, technology, and current status of Forward Osmosis [for example, see the very comprehensive technology report by Sandia National Labs in 2006 (http://prod.sandia.gov/techlib/access-control.cgi/2006/064634.pdf (http://prod.sandia.gov/techlib/access-control.cgi/2006/064634.pdf)) and the very information recent industrial status review http://www.filtsep.com/view/35723/what-s-the-future-for-forward-osmosis/ (http://www.filtsep.com/view/35723/what-s-the-future-for-forward-osmosis/) by Anthony Bennett who appears to be a senior expert in the field] one sees that Forward Osmosis may be best for special situations such as "there is just no other water around" (e.g. desert areas) or "we have to treat this wastewater in order to be able operate our industrial plant at all" (e.g. fracking). It is not obvious that Trevi's Forward Osmosis offering is credible and would be competitive compared to other available alternatives for large-scale drinking water supply in Santa Cruz. A direct look at Trevi's website (http://trevisystems.com/# (http://trevisystems.com/#)) is not exactly confidence-inspiring: Most of the top-of-page links are inactive and very little technical information is available there. Who are these people and where have they gone? I applaud the Santa Cruz WSAC committee for their extensive and excellent work thus far bringing in accessible public view as many water supply alternatives as possible. An informed citizenry is always important. But perhaps the facts on Trevi Forward Osmosis illustrate why actual decisions on which alternatives are best to pursue with public funds in order to assure a reliable future water supply for Santa Cruz are perhaps best reached as a result of due diligence and quantitative engineering trade studies conducted by a team of unbiased, technically-immersed, and experienced individuals, and not by a direct "crowd-sourced" vote of the interested citizenry based on limited advocacy-prone facts provided on a website.

Kelsey Ramage 2d, 12h ago CON

Desal produces great quantities of hyper-salinated water that will kill our kelp forests and much of the coastal life forms. The intake of sea water also kills all the micro-organisms which lead to so many marine life forms, and the tiny life which feeds so many others. Desal creates dead zones. Let's not go there.

Chris Neklason 2d, 12h ago

According to the EIR released as part of the Santa Cruz Desal proposal, this is a false assertion. The brine from desal would be rendered saline neutral by diluting it with the release from the Santa Cruz Neary Lagoon sewage treatment plant which is pumped into Monterey Bay. In many of the desal proposals, the brine release is diluted to saline neutral by diluting it with secondary or tertiary treated water, or in the case of the Moss Landing proposal, by releasing at a depth in below the "life zone" in the Bay trench. Please do not spread these false assertions. They are false. They are contrary to the stated facts in the public documents associated with the desal proposals. They are wrong.

Chris Neklason 2d, 11h ago NEUTRAL

Here's a link to the EIR summary from the Santa Cruz desal proposal: http://www.scwd2desal.org/documents/Draft_EIR/1-0_Exec_Summ_DEIR.pdf (http://www.scwd2desal.org/documents/Draft_EIR/1-0_Exec_Summ_DEIR.pdf) See page 10 of 45 under the section Brine Storage, Disposal, and Conveyance System

Manu Koenig 4w ago PRO

There is no doubt that desal technology overall will continue to improve and costs will continue to come down. Whether or not Trevi is worth implementing would take more info, but they are part of a larger trend.