



THE DENMARKABLE SCORECARD

THE AWBD DENMARKABLE SCORECARD (4/25-4/27)

Destination/Date	Activity/Description	Pros/Savings	Cons/Costs	Is it already in Texas?	Will it work in Texas?
Copenhill (Copenhagen) Monday, 4/25	Also known as Amager Bakke or Amager Slope, opened in 2017, this building is a combined heat and power waste-to-energy plant. It also doubles as a recreational facility featuring a ski slope (no snow required), rock climbing wall, and hiking trail.	Benefits only realized if similar facility was serving an entire region. Don't know the cost benefits over traditional methods.	While not for sure, costs to MUDs would seemingly have to be much higher.	I am not aware of any similar project in Texas.	It could work with the economy of scale but costs would likely be much higher overall.
State of Green (Copenhagen) Monday, 4/25	State of Green is a non-profit public-private that educates people about the world's lack of clean, affordable energy; scarcity of clean water; the growth of cities. See a presentation on the Danish transition to a green economy and how the water sector has led the way.	The concept is great and would benefit districts if they could afford it.	The mindset of MUDs would have to go way beyond voluntary recycling.	It only exists in Texas as a desired concept.	It could work but making it mandatory is a change of mindset and education.
Greater Copenhagen's Energy Center (Copenhagen) Monday, 4/25	The Utility of Greater Copenhagen serves 1.1 million customers. Tour the educational energy center and see a presentation on planning, sewer systems, integrated controls, and water loss reduction initiatives.	Great educational center. Would be of benefit to MUDs again on a large scale. While there is a cost, the education realized is potentially worth it.	Creating the interest and mindset for establishing such a facility would be a challenge.	I am unaware of any such project in Texas.	Such a facility could work in Texas if the educational value and mindset could be generated.

<p>Leif Koch (Copenhagen) Monday, 4/25</p>	<p>Denmark's leading leak detection company, specializing in buried drinking water pipes. We will see a presentation and experience a live leak detection demonstration.</p>	<p>Great company and personnel.</p>	<p>Such technology is of benefit to Districts.</p>	<p>There are leak detection companies in Texas and the Houston area. I don't know if there are any differences.</p>	<p>MUDs do use this technology if the need arises.</p>
<p>Solrødgaard (Hillerød) Tuesday, 4/26</p>	<p>Put into service in 2018, Solrødgaard is a completely covered wastewater treatment plant. Residents can walk on top of the grass-covered facility and use its many walking trails. The plant harnesses heat energy that would otherwise be wasted.</p>	<p>Benefits only realized if similar facility was serving and entire region. Don't know what kind of cost savings there might be.</p>	<p>Such a facility would be quite expensive but if the mindset were to change, the cost might be worth it.</p>	<p>I am unaware of any such facility/project in Texas.</p>	<p>Could work in Texas if the need and desire were there to pay for such a facility. PPP could be established to build and operate such a facility.</p>
<p>DHI Presentation (Hillerød) Tuesday, 4/26</p>	<p>DHI is a leading international water software development and engineering consultancy firm. See a presentation on technical solutions including: digital twins, modeling, process optimization, and feasibility studies.</p>	<p>Interesting presentation.</p>		<p>Not sure but probably.</p>	<p>Yes, it should.</p>

<p>Nye City Tour (Nye) Wednesday, 4/27</p>	<p>Walking tour with Aarhus Vand (Aarhus' water utility) to see the new community of Nye—built with a vision of sustainability and liveability where water is integrated into the urban environment, combing flood protection and recreation and rain-water utilization.</p>	<p>Treatment facility is state of the art. Separation of ground water for drinking and rainwater for toilet flushing and washing machines is very innovative.</p>	<p>Rainwater storage is supplemented by ground water if supply runs low. Cost of overall system seems to be high.</p>	<p>I am not aware of such a facility/project in Texas.</p>	<p>Such a facility could work in Texas. However, rainwater storage would have to be greatly supplemented by other sources.</p>
<p>Truelsbjerg Water Works (Nye) Wednesday, 4/27</p>	<p>This is a state-of-the-art water treatment plant serves 40,000 people. This plant is highly automated and pilots new technologies. Take a tour and presentation from Aarhus Vand and see data analytics, pressure management, and more.</p>	<p>Ground water facility is fantastic. However, was quite expensive along with the O&M.</p>	<p>Just an expensive facility.</p>	<p>I am not familiar with a ground water facility like this in Texas. Typical MUD ground water plants are similar in concept but not on this scale.</p>	<p>Such a facility could work in Texas if the cost could be justified.</p>
<p>Kampstrup Global HQ Tour (Nye) Wednesday, 4/27</p>	<p>Kamstrup is a global leader in system solutions for smart energy and water metering. A factory tour will show the latest advances in ultrasonic water meters, high-performing remote reading solutions, advanced monitoring of pressure and leakages, and data analytics.</p>	<p>DID NOT GET TO VISIT.</p>			

THE AWBD DENMARKABLE SCORECARD (4/28-4/29)

Destination/Date	Description	Pros/Savings	Cons/Costs	Already in Texas?	Will it work in Texas?
AVK's Global Headquarters (Nye) Thursday, 4/28	AVK makes valves, hydrants, and accessories for water and sewer systems and fire protection. Hear about pressure management, smart water initiatives, and the LEAKman Project (leak detection and standards).	Interesting facility and product line.		Don't know if these products are available in Texas but a number of similar products are used in Texas.	Products would work in Texas.
Herning WWTP (Herning) Thursday, 4/28	Herning Vand is the utility company that handles wastewater for the city of Herning's 17,000 customers. Tour energy-positive water utilities. See how struvite extraction from the wastewater are used to produce organic fertilizer.	Fascinating process. While facility is energy positive, I am not sure about the cost savings due to the facility const costs and O&M costs.		I am not aware of such a facility in Texas.	This seemingly could work in Texas if the costs could be justified. A similar sized community or larger to be feasible.
Tour of Lemvig (Lemvig) Thursday, 4/28	Visit Lemvig, a town of about 7,000 inhabitants. Hear about innovative city projects like testing pipes made out of recycled fish nets/plastic; a ground movement tracking satellite system to improve pipe lifespan; and other climatorium projects.	Very interesting facility and great reuse ideas for fish nets/plastic.		I am unaware of such a facility in Texas.	Reuse of plastic is always a good idea but has not been done in Texas that I am aware of.
Dinner at Grundfos (?) Thursday, 4/28	Grundfos, the world's largest pump manufacturer and a global water technology company, will treat us to a dinner in their guest house.	One of the greatest dinners I have ever had anywhere in the world.			

<p>Grundfos (Sønderbro?) Friday, 4/29</p>	<p>Factory tour, showing the latest in water utility pump and data innovation.</p>	<p>Tour, presentations, and product demos were excellent.</p>		<p>Grundfos American HQ is in Sealy, Texas.</p>	<p>Products are already working in Texas.</p>
<p>Billund Biorefinery (Billund) Tuesday, 4/26</p>	<p>See how Billund, a city of 26,000 inhabitants, powers their WWTP with biogas and how they combine municipal waste and sludge from other WWTP's to create electricity, fertilizers, and bioplastics, and scalability.</p>	<p>Wonderful facility. See my comments from the Herning WWTP above.</p>			