

**Organization of Clean Energy and Climate (OCEC)**

**Computing Heat Recycle Technology  
Development Center**

Tao Wu

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# What is computing heat?

- ▶ Nearly 400 TWh power used by data center in 2021. ( 1 TWh lights over 1 million home for a year)
- ▶ 1 MWh computing generates about 4 million BTU Heat.
- ▶ Almost all of computing heat is wasted today.



Global trends in digital and energy indicators, 2015-2021

	2015	2021	Change
Internet users	3 billion	4.9 billion	+60%
Internet traffic	0.6 ZB	3.4 ZB	+440%
Data centre workloads	180 million	650 million	+260%
Data centre energy use (excluding crypto)	200 TWh	220-320 TWh	+10-60%
Crypto mining energy use	4 TWh	100-140 TWh	+2 300-3 300%
Data transmission network energy use	220 TWh	260-340 TWh	+20-60%

Sources: Internet users [ITU (2022)]; internet traffic [IEA analysis based on Cisco (2015); TeleGeography (2022); Cisco (2019), Cisco Visual Networking Index]; data centre workloads [Cisco (2018), Cisco Global Cloud Index]; data centre energy use [IEA analysis based on Malmodin & Lundén (2018); ITU (2020); Masanet et al. (2020); Malmodin (2020); Hintemann & Hinterholzer (2022)]; cryptocurrency mining energy use [IEA analysis based on Cambridge Centre for Alternative Finance (2022); Gellersdörfer, Klaaßen and Stoll (2020); McDonald (2022)]; data transmission network energy use [Malmodin & Lundén (2018); Malmodin (2020); ITU (2020); Coroama (2021); GSMA (2022)].





# Our Center Missions and Goals

## Our Missions:

- ▶ Develop technologies and systems to demonstrate how residential, commercial and industrial can recycle the computing heat waste as a replacement of traditional heating.
- ▶ Perform research and study on more effective ways to use computing heat.

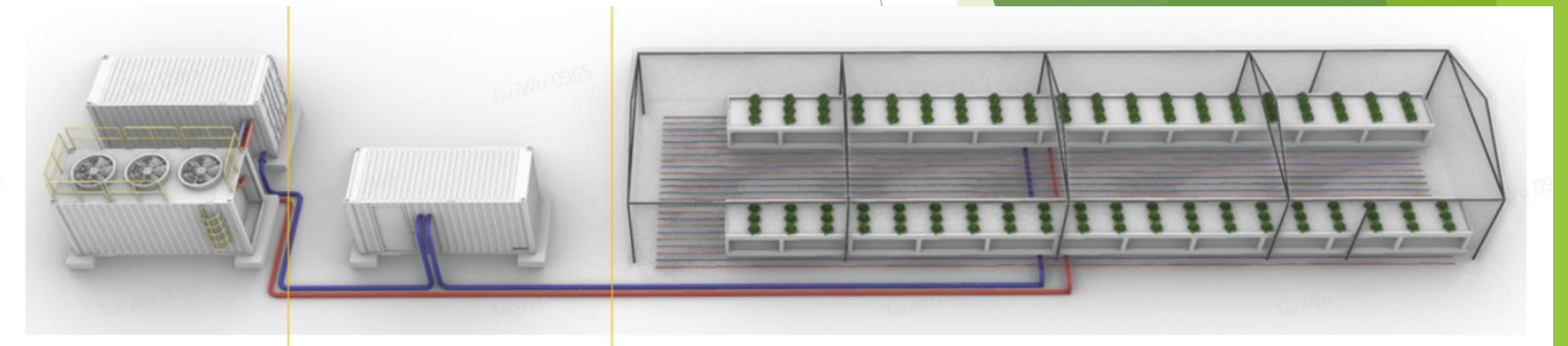
## Our Goals:

- ▶ Build the center in a way to benefit local community.
- ▶ As the first of this kind of R&D center, continue to be the leader of this field in the world and bring the best computing heat recycle solution to the world.
- ▶ Be one of key contributors in achieving carbon neutral efforts.

# Our Center Short Term Development Plans

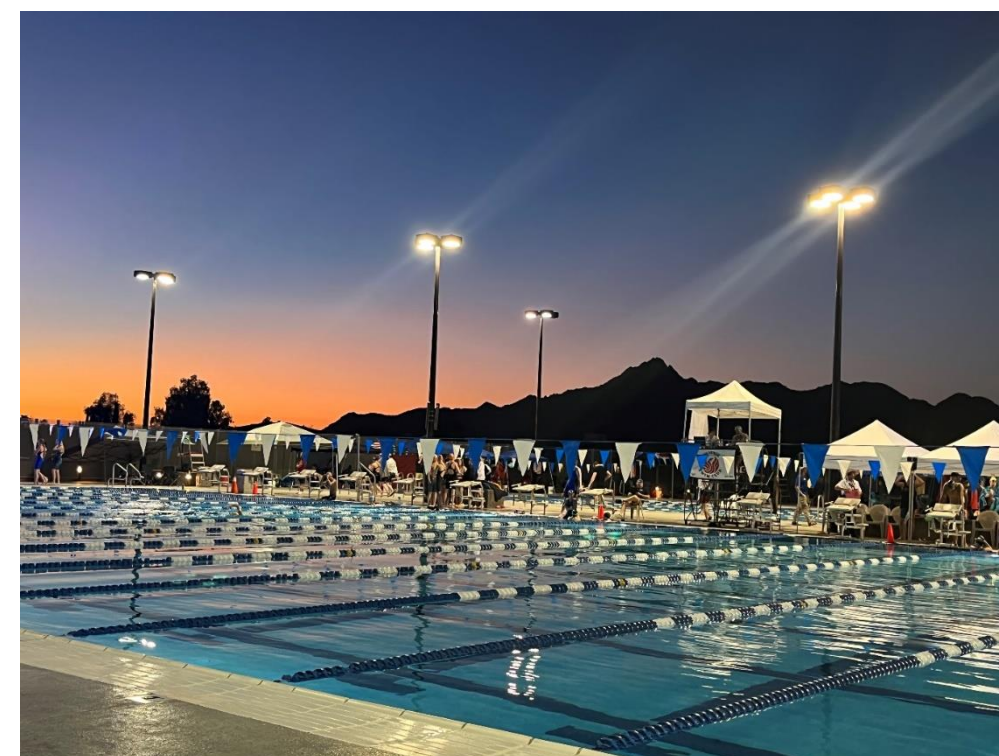
► **Plan I:** Use the greenhouse facility as an open platform for purposed vegetable grow, education and research projects

1. Work with Harvest of Hope for vegetable supply
2. Set up education programs with local academic schools
3. Establish collaboration research projects



► **Plan II:** Build next heat recycle application projects

1. Fish hatchery project
2. Public pool project



Refer to “Wild Rose State Fish Hatchery, Wisconsin”

Refer to Keno Public Aquatic center in Mesa, AZ



# Our Team

Computing Center (OCEC Board Member Committee)

Center Educators  
James York

Director of Center (Tao Wu)

Center Advisory Committee  
Mark Edgell  
George Banziger  
Jesse Roush  
Marcus McCartney

Harvest of Hope  
Coordinator

Center Education  
Coordinator

Center Research  
Program  
Coordinator

New Application  
Build Coordinator

Center Funding  
Coordinator

# Center Funding Sources

- Membership fee of sponsors
  - Annual membership fee: \$5,000
- Grants of research projects
- State and Fed government funds supporting waste heat recycle and carbon neutral projects
- Revenue from onsite collaboration projects
- Donation (we are a Non-profit organization 501(c) (3))

# BACK UP



# OCEC Computing Heat Recycle Technology Development Center

