

Isolated Power Systems Connect

July 28th, 2022

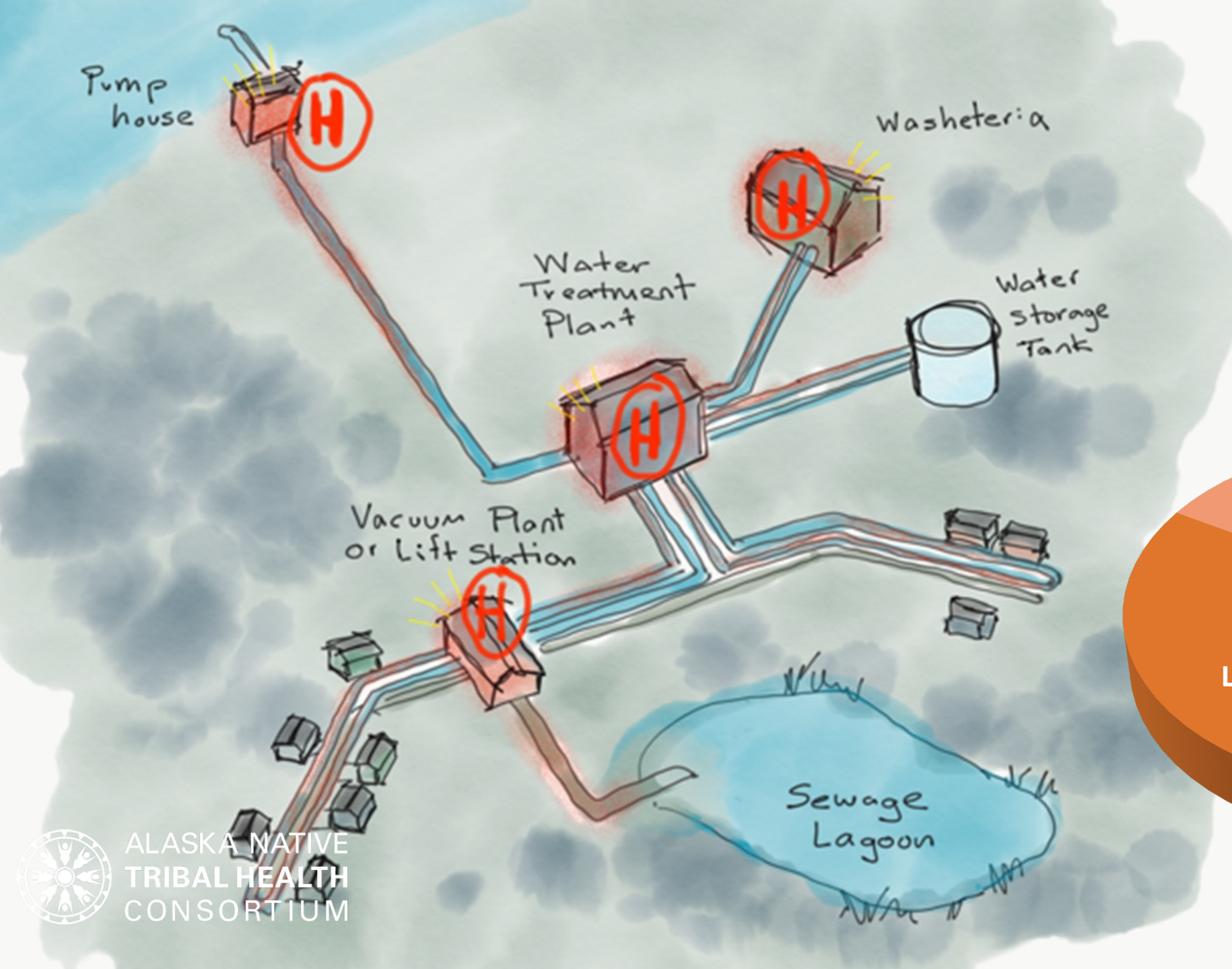
Heating Loads with Diesels Off

Bailey Gamble, PE, Mechanical Engineer III

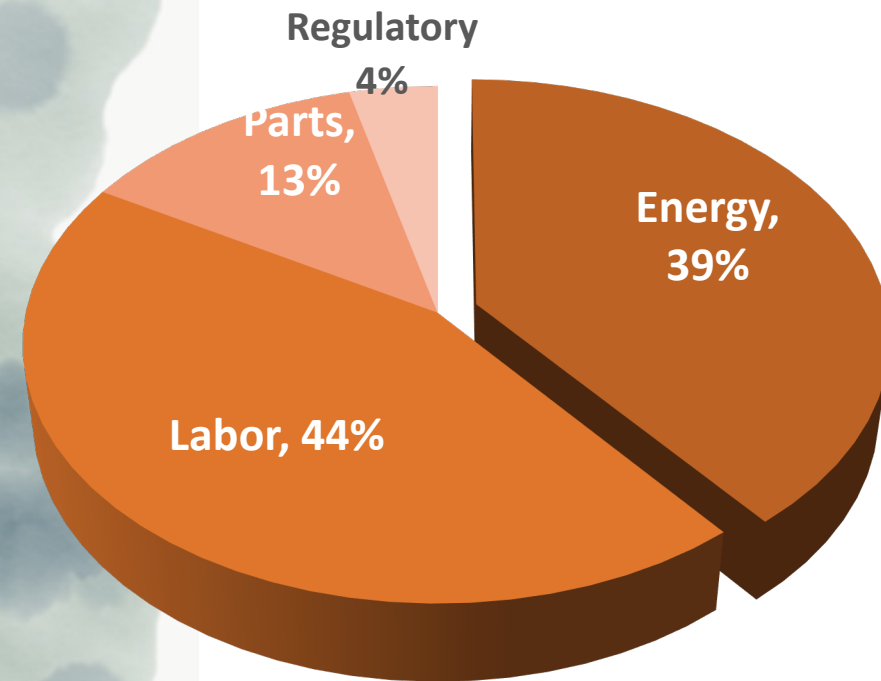
ANTHC - Rural Energy Program



ALASKA NATIVE
TRIBAL HEALTH
CONSORTIUM

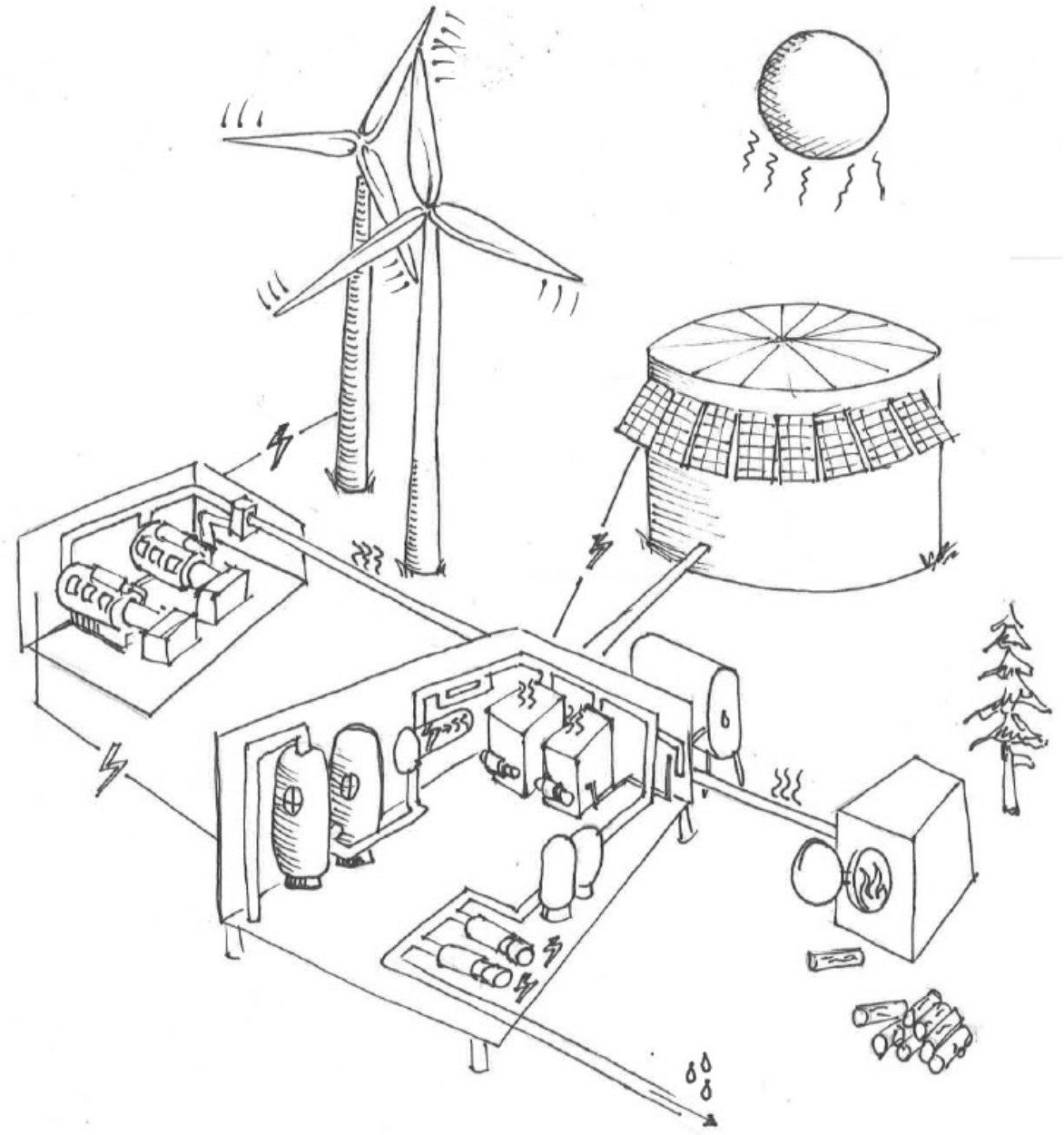


Energy in water and sanitation



High Penetration Renewables and Heating

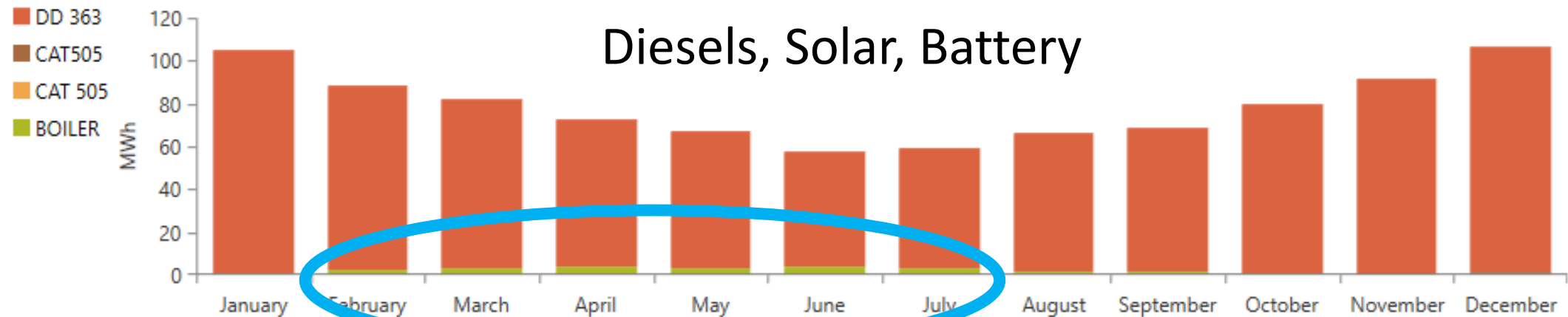
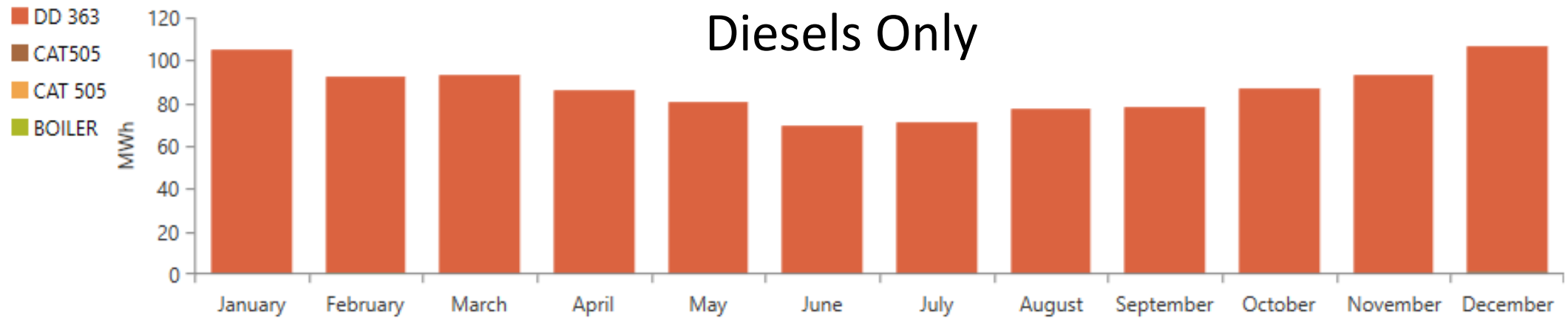
- Energy efficiency first
- Community scale renewables key to stabilizing, lowering energy costs
- Community scale > facility scale
- Community scale renewables can increase wat/san energy cost



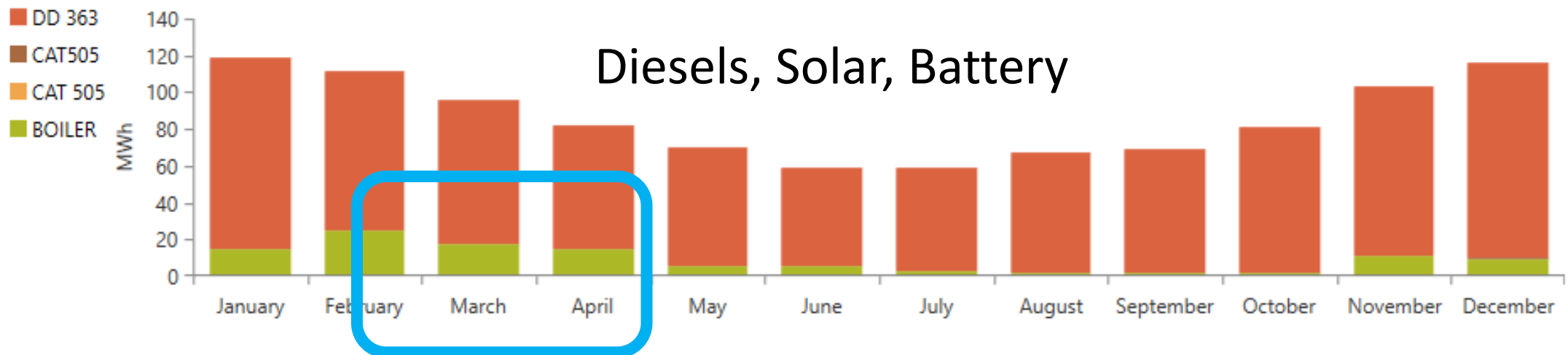
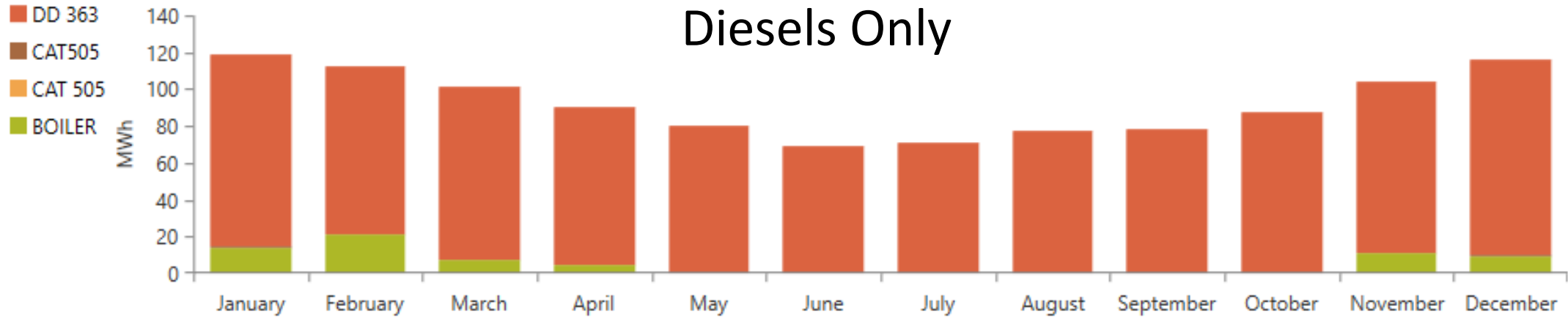


I ❤️ marine manifolds

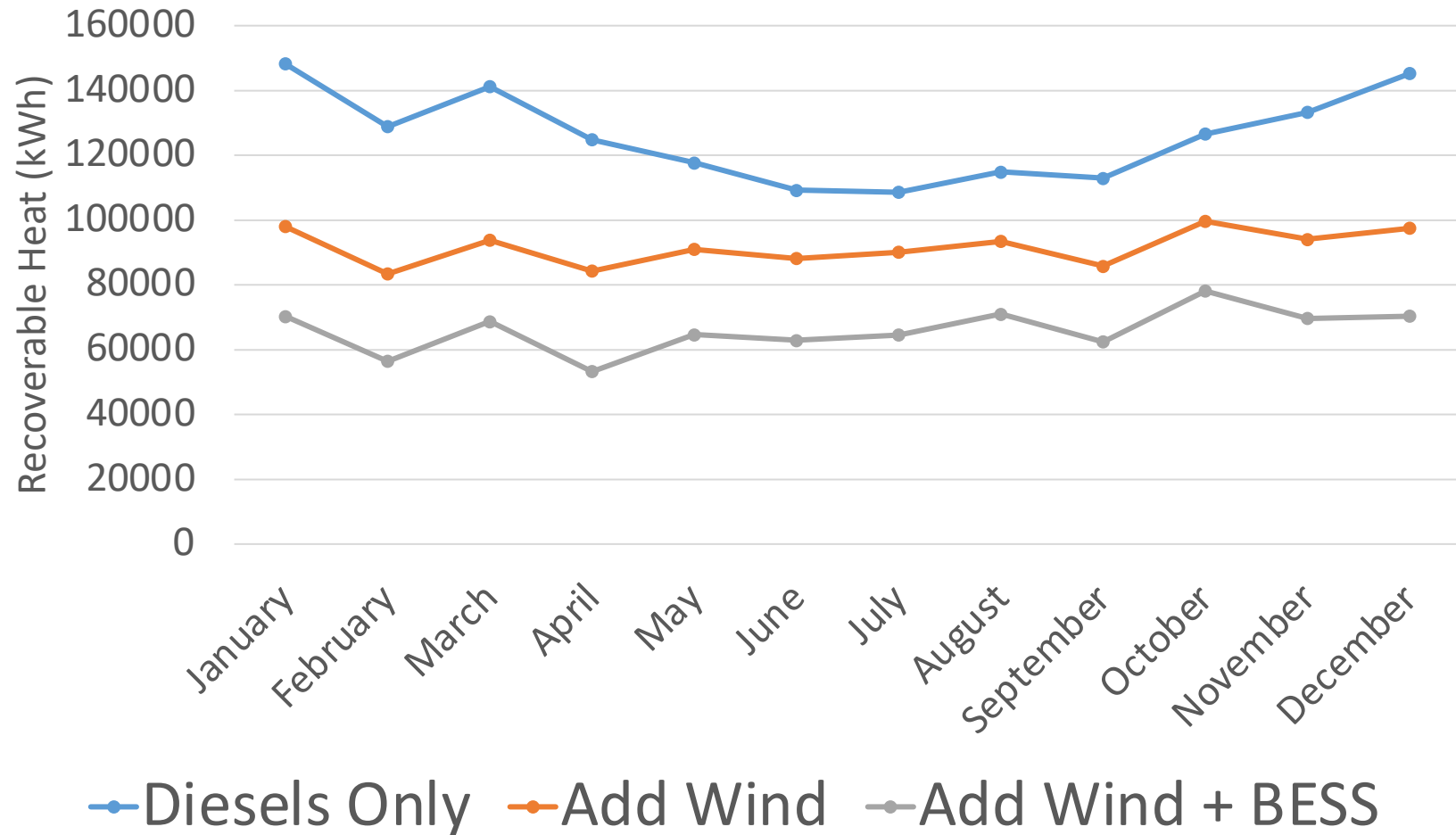
Shungnak HR Serving WTP



Shungnak HR Serving WTP, City Office, VPSO, Cookhouse, Store, and Clinic



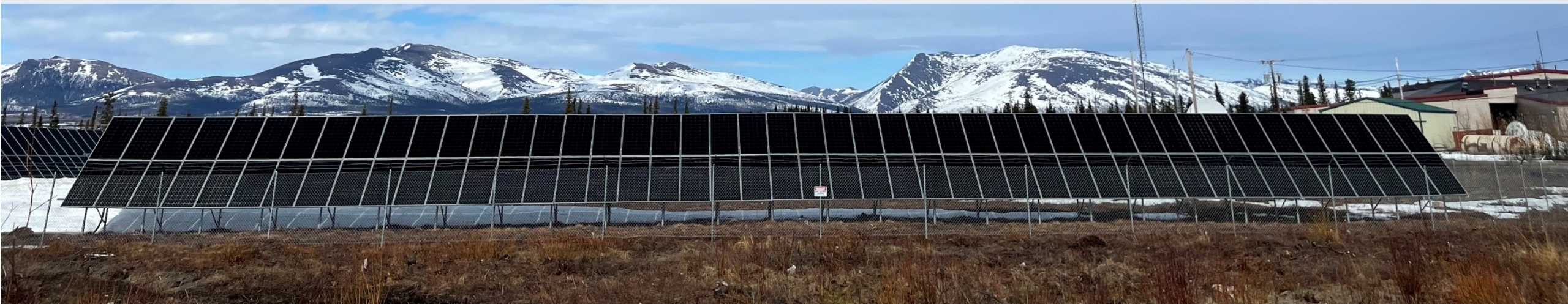
Chevak Recoverable Heat



Avg. Load: 292 kW
Gen 1: 505 kW
Gen 2: 499 kW
Gen 3: 824 kW
Wind: 400 kW
Battery: 512 kWh
500 kW
Diesel Min Load:
25%

Solutions

- Electrify heat - where feasible, use low cost excess renewable power to serve end-user heat loads
- Establish community aligned IPP to own, operate, sell renewables to utility, use revenue to subsidize wat/san, offset increased cost
- Ideas???



Key Points/Next Steps

- Heat must be considered as a critical product of rural PPs. Always consider existing heat loads when developing renewable projects.
- System wide benefit of renewables positive, lost-end user heating still felt by end-users
- Integration of BESS reduces thermal output more than renewable integration alone
- Renewable projects should evaluate replacing lost recoverable heat with excess electricity.
- Need for improved end-user utilization of PP heat – matching heat load to available heat, thermal storage
- When recovered heat loads are considered, does this shift the economic sweet spot for storage size?



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