



Occupancy Fan Controller (OFC™)

Robert Mowris P.E. and Anna Mowris B.S.



SUMMARY

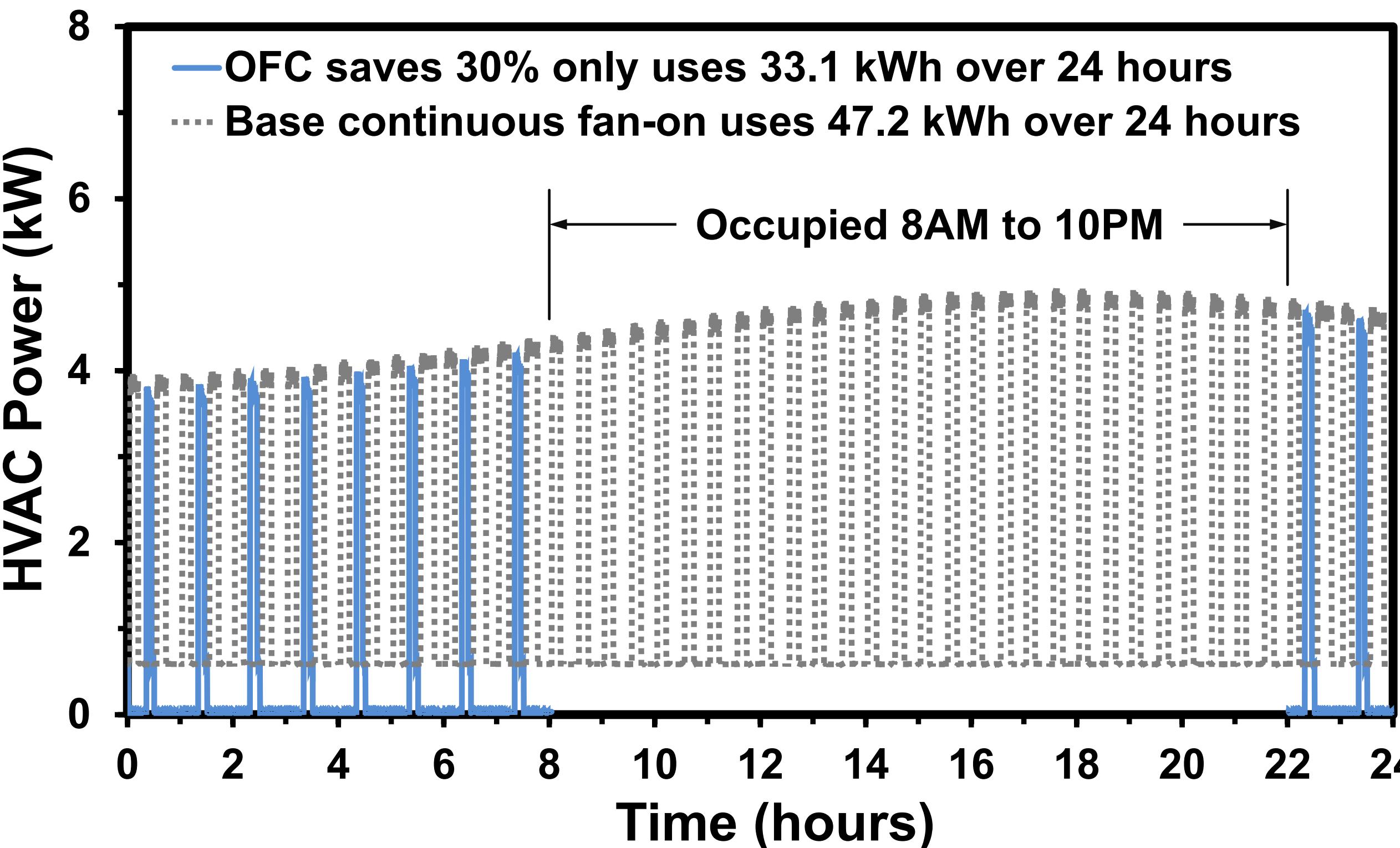
- **OFC** switches fans from “ON” to “AUTO” when buildings are partially or fully unoccupied with dual PIR and ultrasonic sensors (or geofencing, CO2, etc.).
- **OFC** saves 14 to 27% on HVAC energy based on Intertek laboratory tests, field tests, and EnergyPlus simulations of 20 commercial buildings in 16 climate zones.

| HVAC type | OFC Savings kWh/yr | OFC Savings kW | OFC Savings Therm/yr |
|-------------|--------------------|----------------|----------------------|
| AC only | 14% | 2% | |
| AC Gas Heat | 14% | 2% | 14% |
| Heat Pump | 27% | 3% | |
| Var. Volume | 19% | 2% | 22% |
| Average | 19 ± 2% | 2 ± 1% | 18 ± 4% |

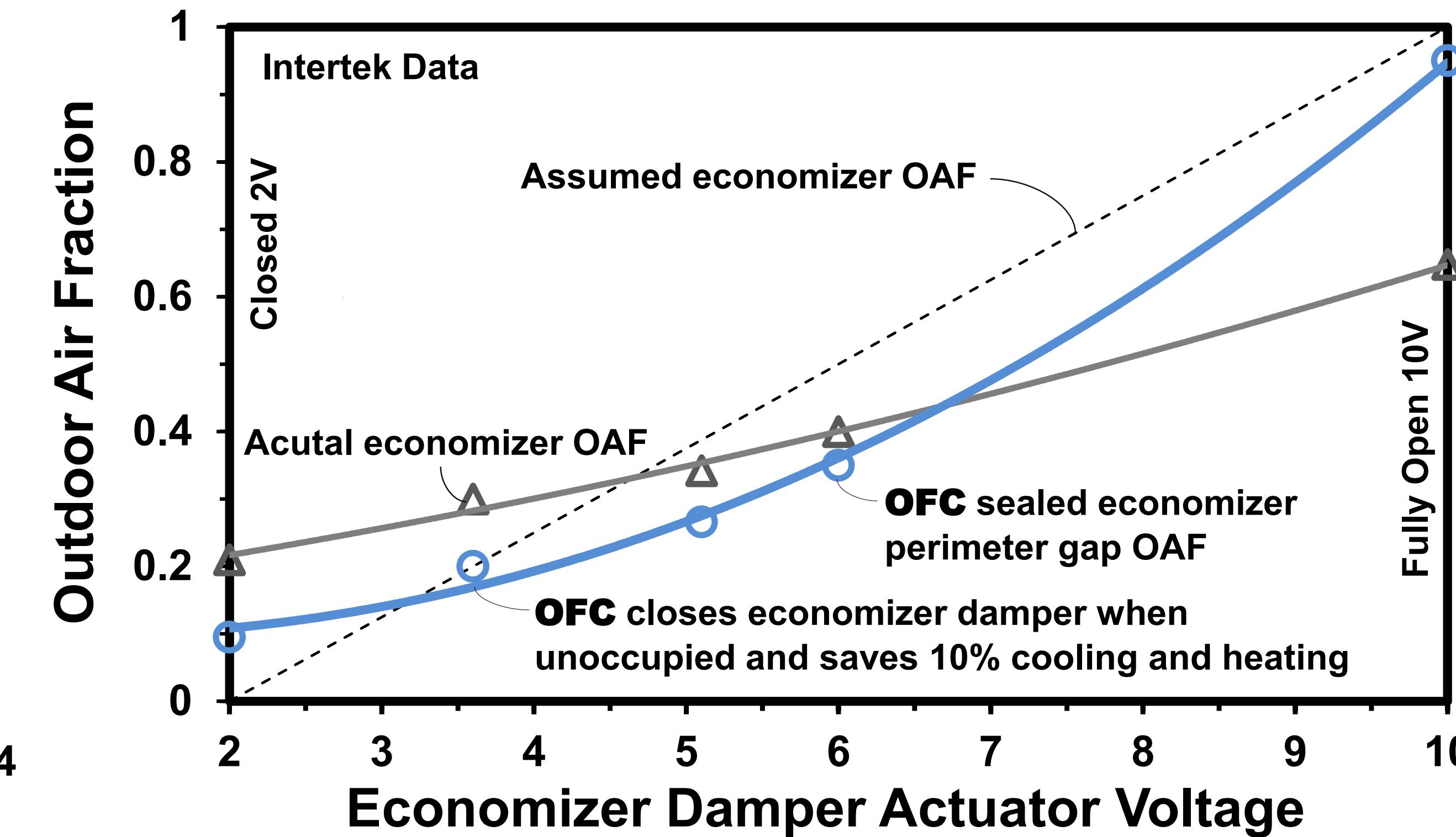
- **OFC** variable delays save 13% on cooling and heating to improve energy efficiency, comfort, indoor air quality, and prevent biofilms biofilm.montana.edu pubmed.ncbi.nlm.nih.gov/31845419/
- **OFC** closes dampers when unoccupied to reduce outdoor airflow by 10 to 20% and with perimeter gap sealing increase economizer cooling by 10 to 30%.
- **CPUC-approved** SWHC062 OFC has average TRC of 4.8 and average savings of 725 kWh/yr-ton, 0.2 kW/ton, and 7.6 therms/yr-ton.

EXPERIMENTAL METHODS, MODELS, AND ARPA-E SENSOR PROGRAM

- **ARPA-E** says occupancy HVAC controls are the most cost-effective energy efficiency measure in buildings.

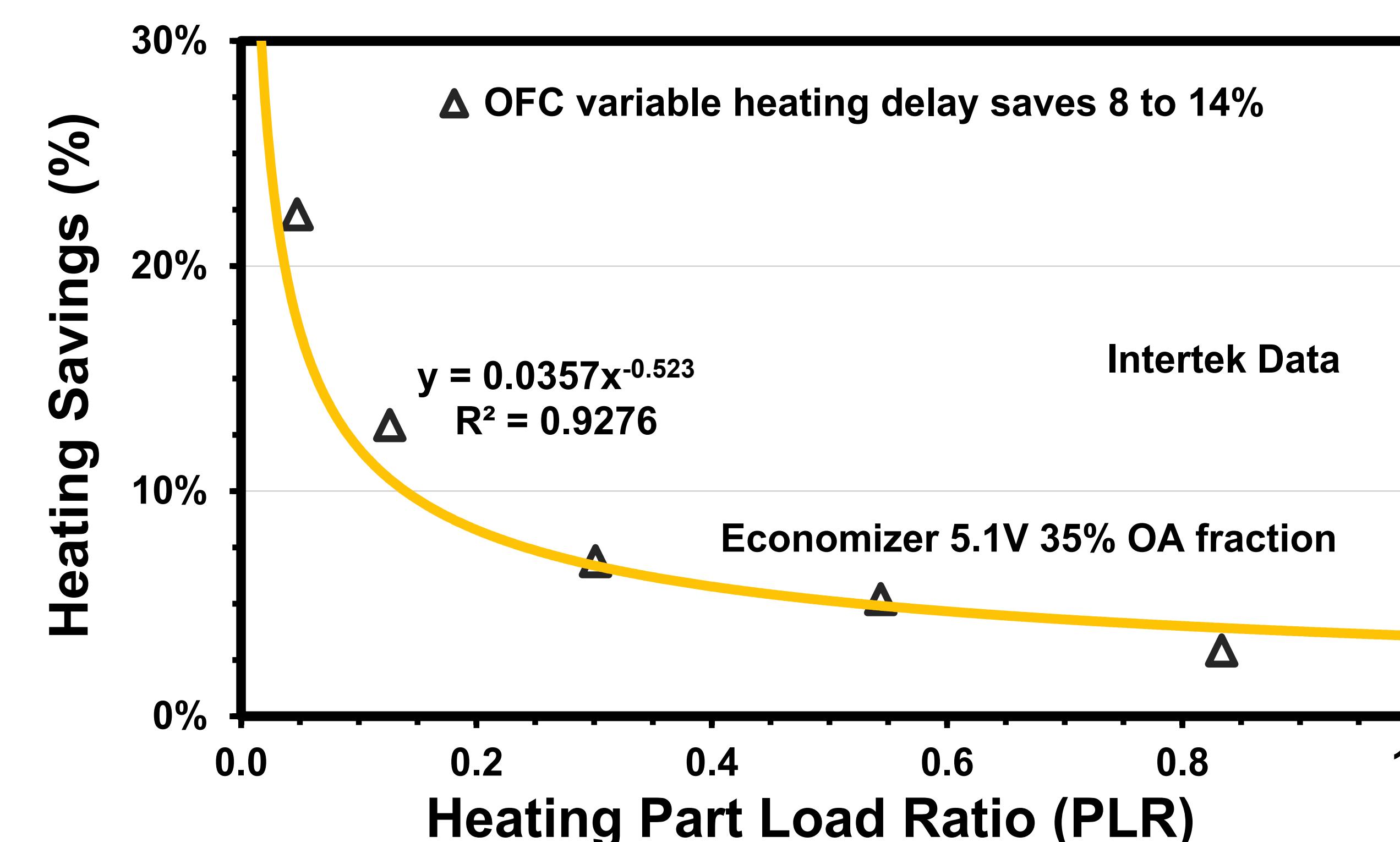
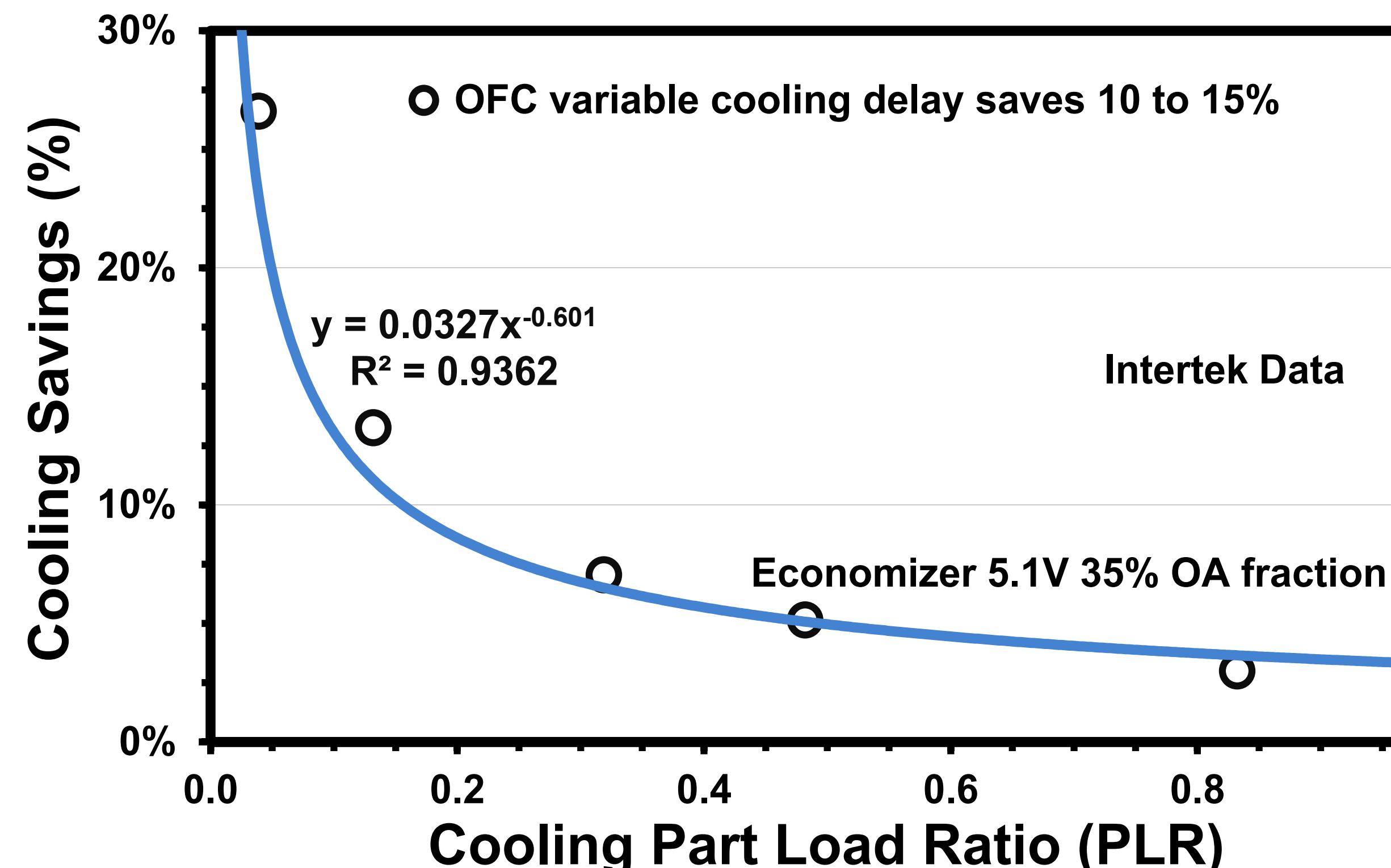
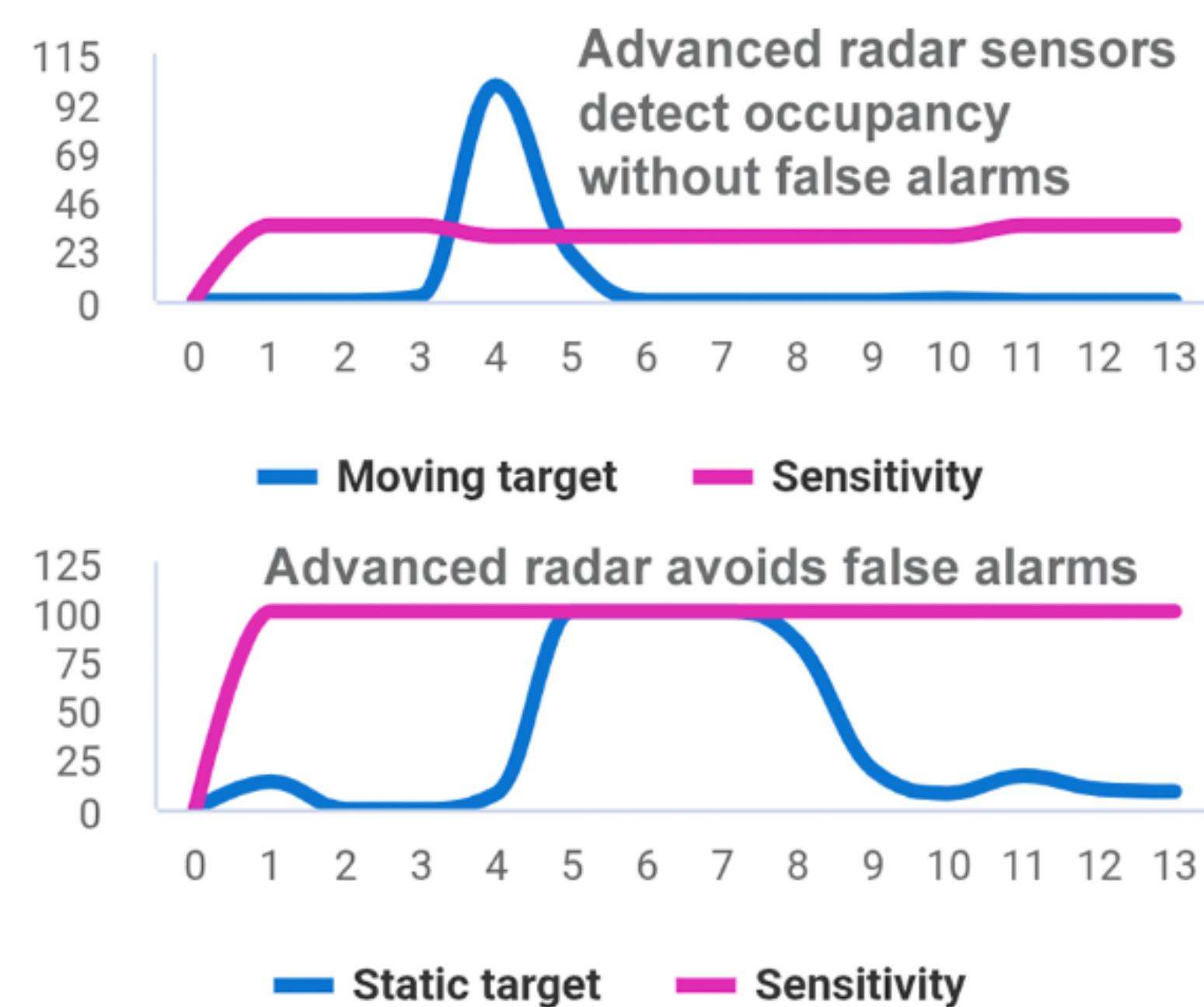


- **Potential savings are 20 to 30% of HVAC** or 2 to 4% of total annual US energy (ARPA-E 2022).



OFC SENSOR TECHNOLOGY

- **OFC** advanced radar detects occupancy without false alarms



- **OFC sensors** allow fan operation in economizer cooling or pre/post purge with adjustable fan-off delays of 20 to 60 minutes before switching fans from ON to AUTO and enabling fan operation for cooling or heating.

- **US Patents** 11879651, 9671125, 10,001,289, 11022335, 11029061, 11029057, 9995493, 11175060, 11,879,651, 11,460,208

www.greenfan.co/OFC