

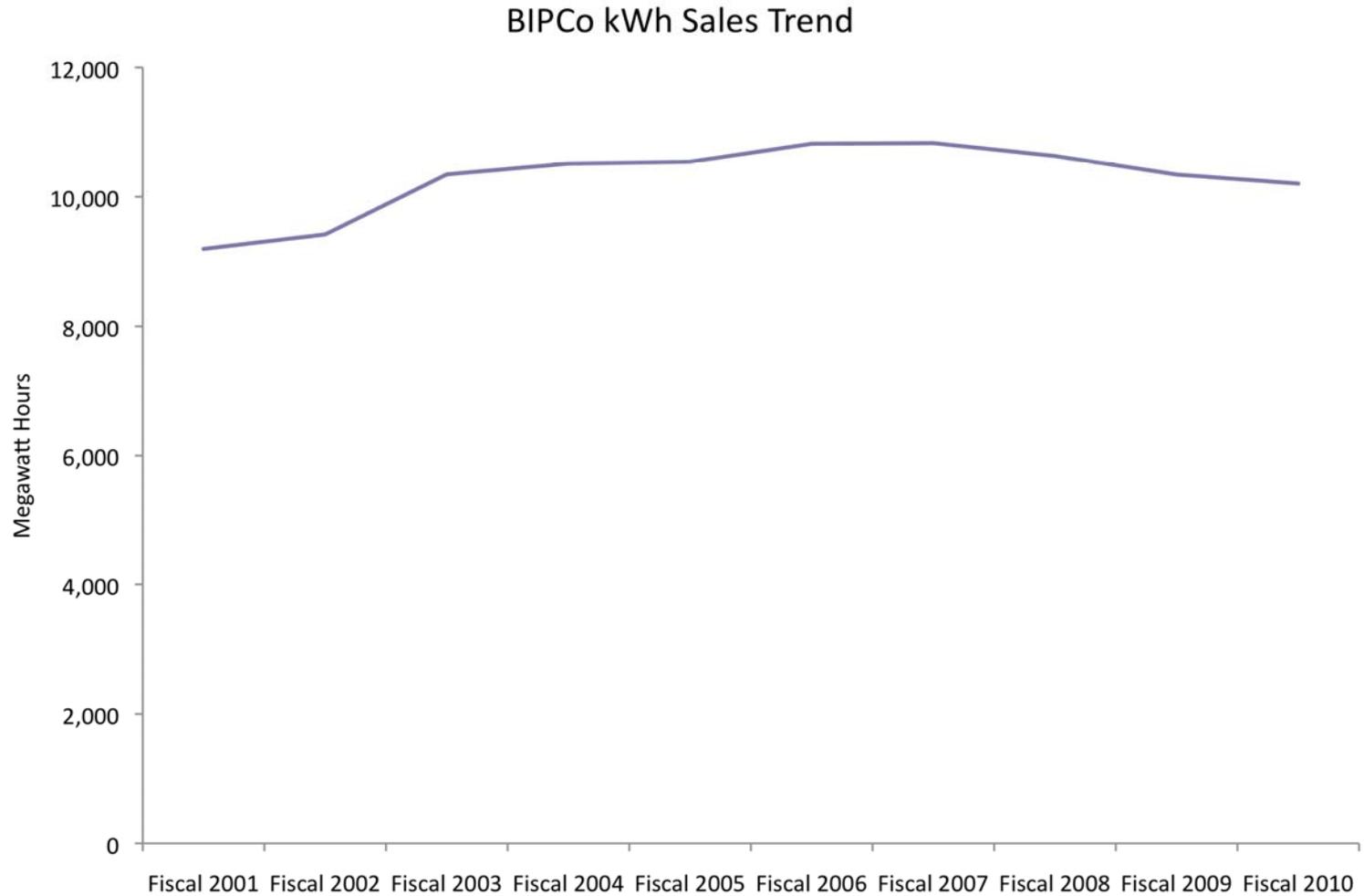
# Block Island Electricity Costs

May, 2012

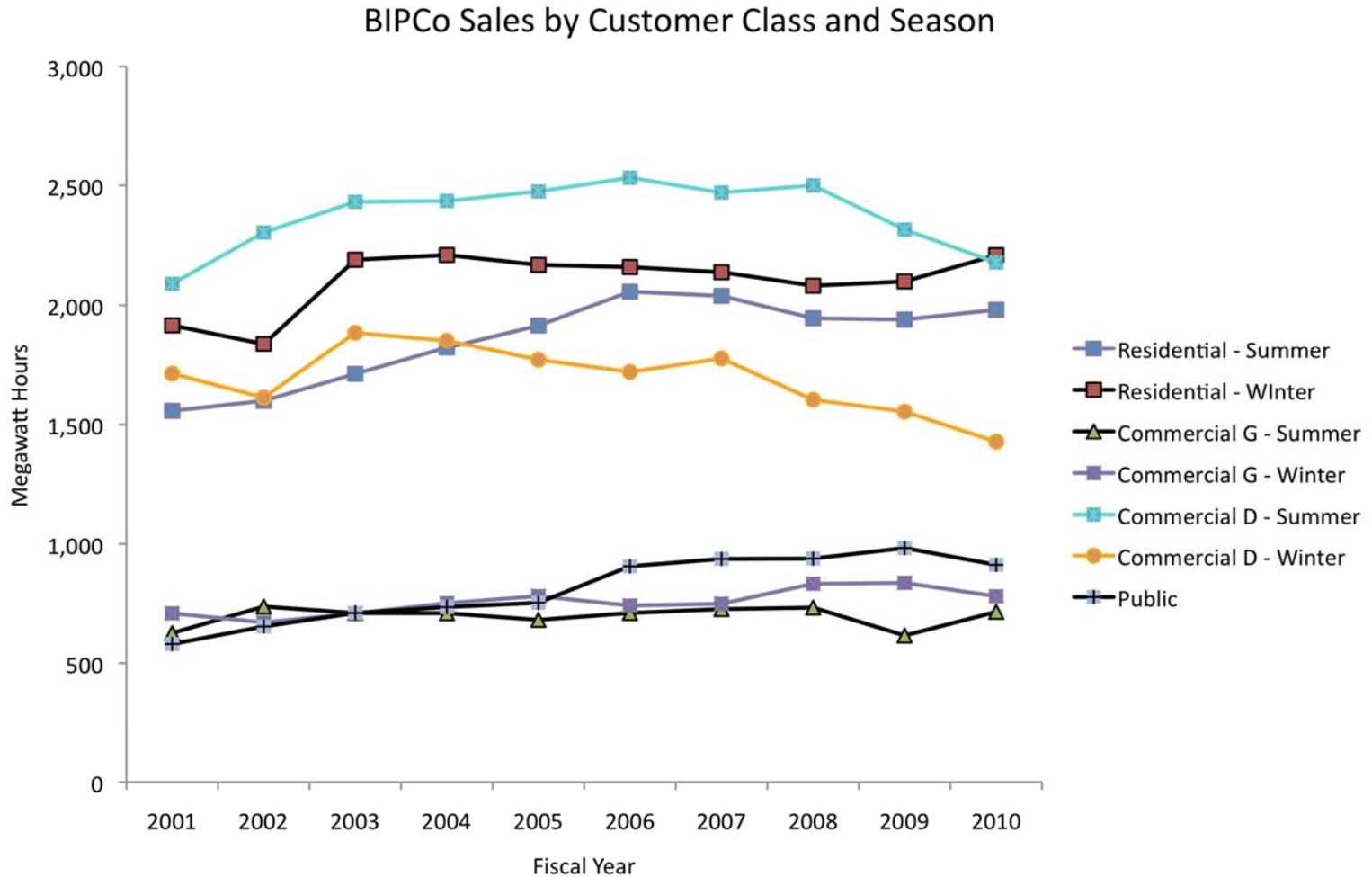
# BIPCo Background

- BIPCo has a legislative charter to be the exclusive distributor of electricity on Block Island and supplies the electricity by operating diesel generators.
- BIPCo is funded through rates paid to BIPCo and through a fuel charge that is passed directly through to ratepayers:
  - Current BIPCo costs recovered in rates are approximately \$2.2 million per year or \$0.22 per kWh
- BIPCo electricity sales have been declining slightly over the past several years because of declining sales to large commercial customers in both the summer and the winter
- BIPCo's fuel charge is directly related to the price of diesel fuel and have been highly volatile, ranging from \$0.12 to \$0.36 per kWh over the past two years

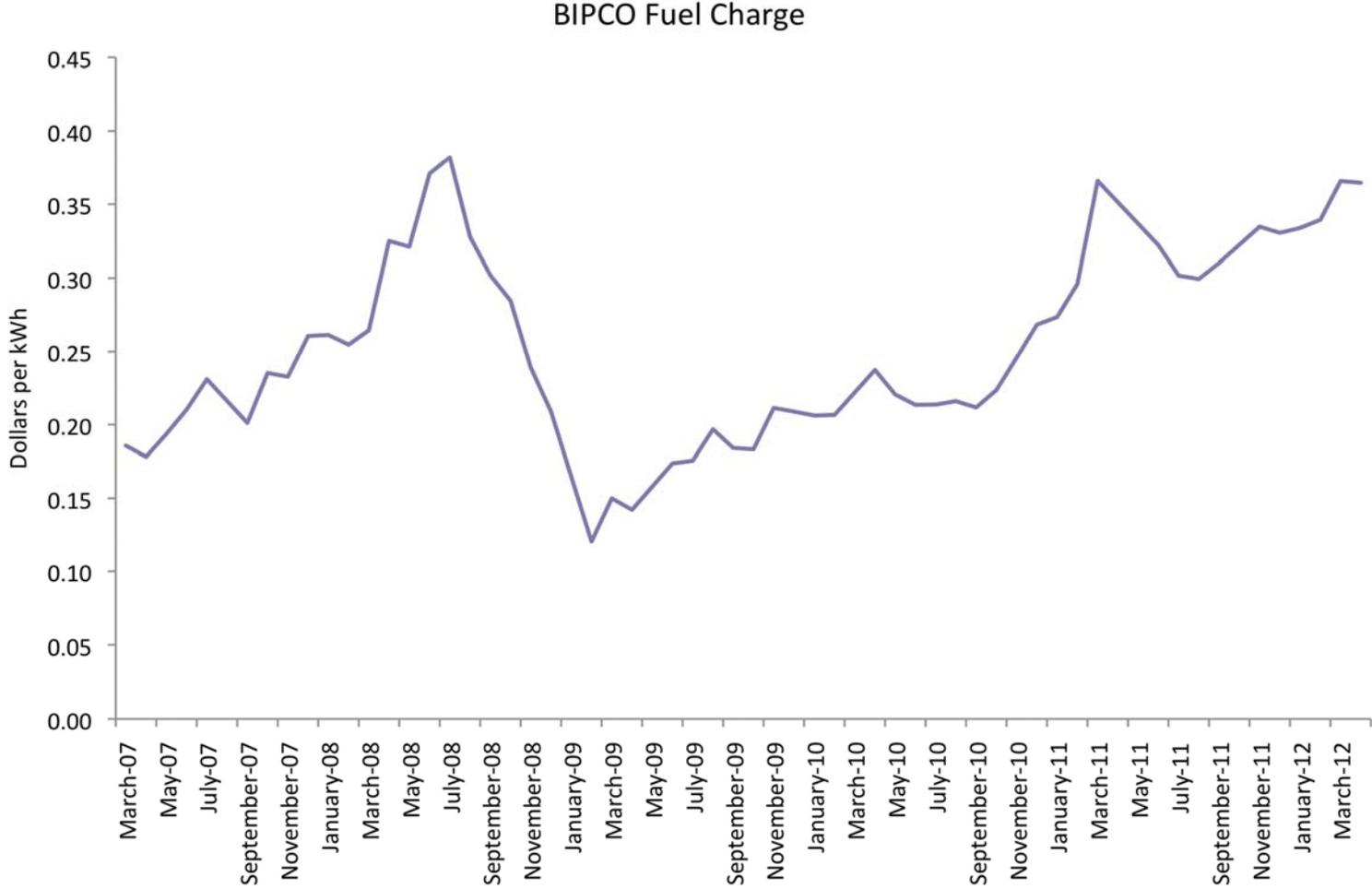
# Trend in kWh Sales



# Trend in kWh Sales by Customer



# BIPCo Fuel Charges



# BIPCo Requires Non-Generation Investment

- Removal of underground fuel storage tanks by 2017 in order to comply with environmental regulations
- Upgrade distribution system in order to improve system reliability and efficiency
  - Potential to include smart grid and meter technology with distribution upgrade
- Rate design study to ensure rates promote investment in conservation and allocate costs fairly
  - Needed either with or without a cable to the mainland
- Ratepayers will be required to fund these activities

# Distribution Upgrade

- Expected benefits
  - Fewer outages over time with removal of aging equipment
  - Shorter outages with greater system control
  - More stable voltage without increasing system losses
  - Avoid future issues as current equipment becomes obsolete and parts become less available
- Estimated cost: \$4-4.5 million including smart meters – annual cost \$320,000 in interest and principal (25 years, 5%)
- Fuel savings to ratepayers:
  - 4.3% of BIPCo generation, or 440,000 kWh per year
  - Value of savings depends on fuel costs
    - At \$0.33/kWh (current fuel charge) - \$145,000
    - At \$0.10/kWh (purchased fuel with cable) - \$44,000
- Net cost ratepayers
  - Fuel at \$0.33/kWh - \$185,000 per year or \$0.0175/kWh
  - Fuel at \$0.10/kWh - \$276,000 or \$0.027/kWh

# Alternative Supply Options

Option	Capital Cost	Total Annual Savings	Reduced Total Island Fuel Charge
Deepwater Cable	Total: \$45 million BI Allocation: Under \$3 million	\$2 million	\$0.20/kWh
Standalone Cable	Total: \$35-40 million BI Allocation: 100%	Essentially breakeven or lower	0
On-Shore Wind	\$2.8 million for .6 MW	\$200,000	\$0.02/kWh
PV - Residential	\$12,000 per house \$6 million for 1 MW capacity	\$150 per house on fuel charge \$75,000 for 1 MW	\$0.0075/kWh for 1 MW

# Cable Options

- Cable to mainland would stabilize fuel charges by moving away from oil generation
- Actual savings will depend on the cost of the cable charged to Block Island
- Cable costs are unknown, best current estimate comes from Deepwater, who has done considerably more engineering than previous studies
  - Principal driver of cable costs is route
    - Early BIPCo studies focused on Charlestown area
    - Deepwater says environmental, sub-surface conditions and interconnection issues make Charlestown area impractical
  - BIPCo cable estimate at or below \$20 million
  - Deepwater estimate over \$40 million for longer route, greater cable capacity, includes considerably more engineering and interconnection capability
  - Actual cost of a cable just to serve Block Island likely to be somewhat but not greatly less than Deepwater estimate - \$35-40 million

# Cable Options (continued)

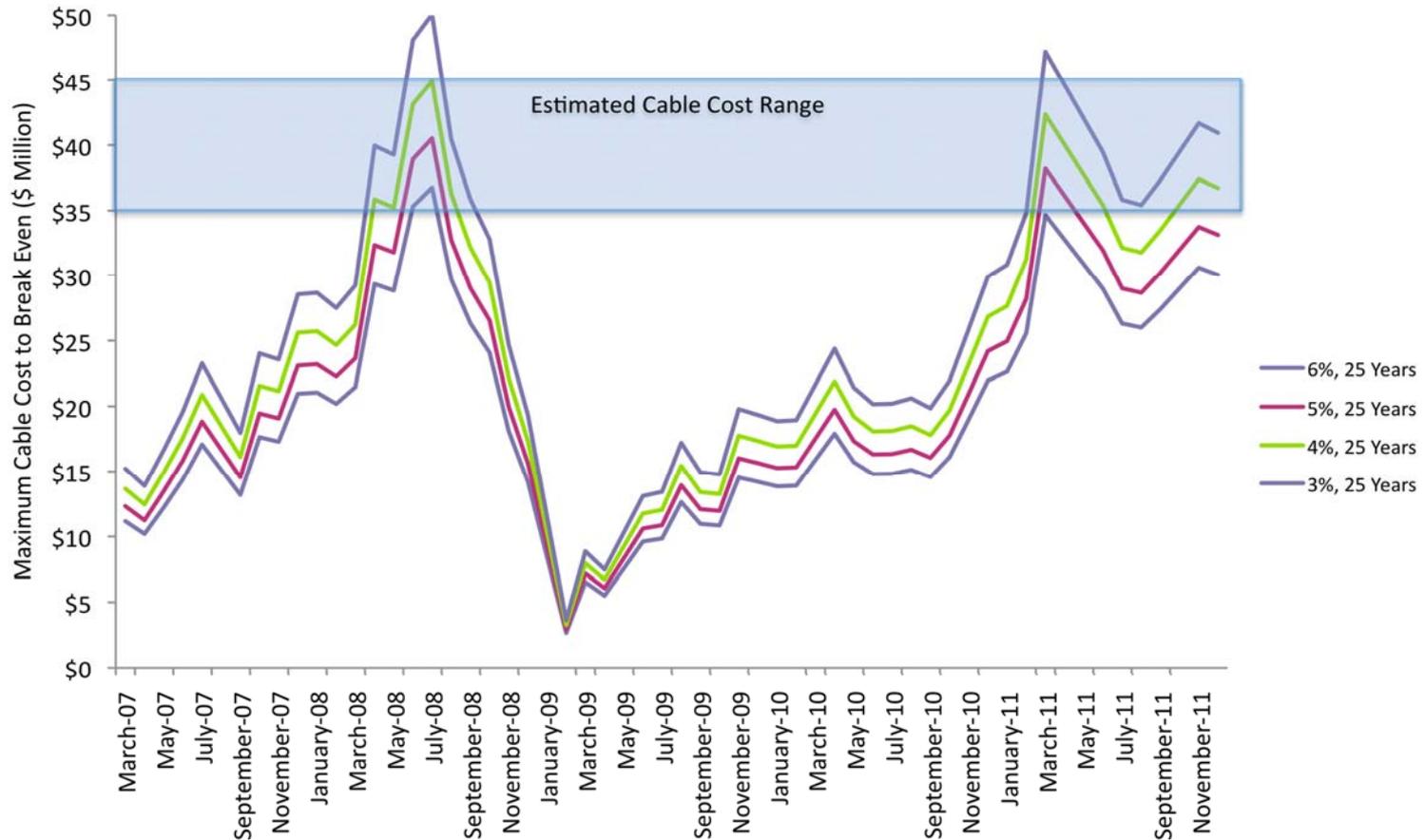
- Cable cost allocation is critical to economics
  - Under 10% of Deepwater cable costs allocated to Block Island by statute
  - 100% of standalone cable costs allocated to Block Island unless “socialized” to mainland ratepayers or covered by grants, etc.
- Cable savings to BIPCo ratepayers are a function of:
  - Net energy savings: Fuel charge minus mainland power costs
  - Annual cable cost: Essentially principal and interest on cable capital costs – interest rate and financing period
  - Allocation to Block Island of cable cost: Allocation proportion
  - Actual cable economics are more complicated and include growth in kWh usage, fuel price trends, various cable fees, inflation, etc., but these tend to cancel each other out and financing costs relative to net energy savings is a good first approximation

# Relative Cable Economics

Deepwater Cable	Standalone Cable
Estimated cable cost: \$45 million, allocation to Block Island ~5%	Estimated cable cost: \$35-40 million, 100% allocation to Block Island
Annual cable cost to Block Island: \$150,000 or \$0.015/kWh	Annual cable cost to Block Island: \$2.5 million or \$0.25/kWh
Fuel savings depend on fuel charge: Fuel charge minus ~\$0.10/kWh purchased power cost - \$0.23/kWh or \$2.3 million at current fuel charge	Fuel savings depend on fuel charge: Fuel charge minus ~\$0.10/kWh purchased power cost - \$0.23/kWh or \$2.3 million at current fuel charge
Net annual savings to Block Island: Over \$2 million or \$0.20/kWh	Net annual savings to Block Island: Essentially breakeven or slightly below breakeven

# Standalone Cable Economics

Maximum Breakeven Cable Cost Based on Monthly Fuel Charges  
Assumes 10.2 million kWh and \$0.10/kWh Purchased Fuel



# On Shore Wind Turbine

- Concept:
  - Erect 600 kW wind turbine on-island
  - Sell power to BIPCo
  - Ownership structure and process for distributing savings to ratepayers to be determined from options
    - Ownership: Coop or other ratepayer group, Town, private developer
    - Savings distribution: Lower fuel price to BIPCo, profits from wind turbine distributed directly to ratepayers
  - Issues surrounding integration with BIPCo limit total wind capacity that can be connected
  - Siting issues remain unresolved
- Economics:
  - Estimated capital cost:
    - \$2.8 million
    - Annual financing cost at \$180,000 per year
  - Estimated annual fuel savings, no cable connection
    - \$350,000-\$450,000 depending on BIPCo fuel costs
  - Net annual savings for all BIPCo ratepayers:
    - \$175,000-\$275,000
    - \$0.017 to \$0.027/kWh

# Distributed Photovoltaic

- Concept:
  - Install solar photovoltaic cells on island houses and businesses
  - Possibly provide Town funding mechanism and aggregation of projects to reduce costs
- Economics - Residential:
  - Estimated capital cost:
    - \$12,000 per system for an average home (\$6 per watt)
    - Annual financing cost at \$645 per year under a municipal financing program
    - Net cost ~\$0.29/kWh
  - Estimated annual savings
    - \$150 per house on fuel charges, \$570 if PV system totally on customer side of meter (no resale to BIPCo)
    - Weighted average savings \$0.025 per kWh used by house on fuel savings
- Economics – Commercial:
  - Estimated capital cost:
    - \$250,000 per system for 50 kW system (\$5 per watt)
    - Net cost of ~\$0.25/kWh
  - Estimated annual savings
    - \$3800 per year per system