Summerland Solar+Storage Project

Community Update

Quick Facts

Number of solar panels: ~3200

Lifespan: 35 years for solar array, 20 years for batteries

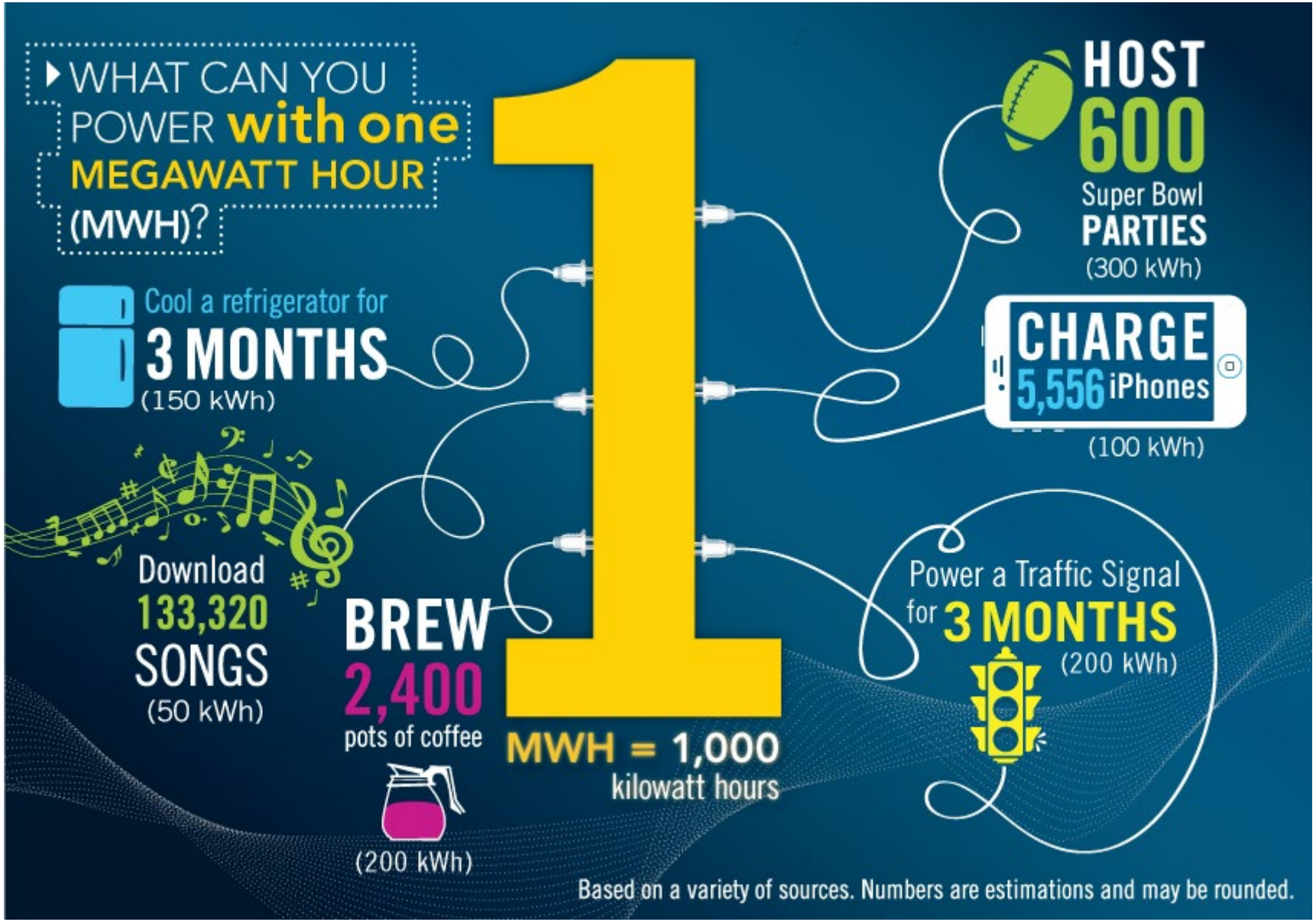
Project costs: $6,980,000

Expected payback for District utility: 4-5 years

Potential sites examined: 108

Land required: 5 acres

Annual energy production: 1,175,000 kWh (1,175 MWh)



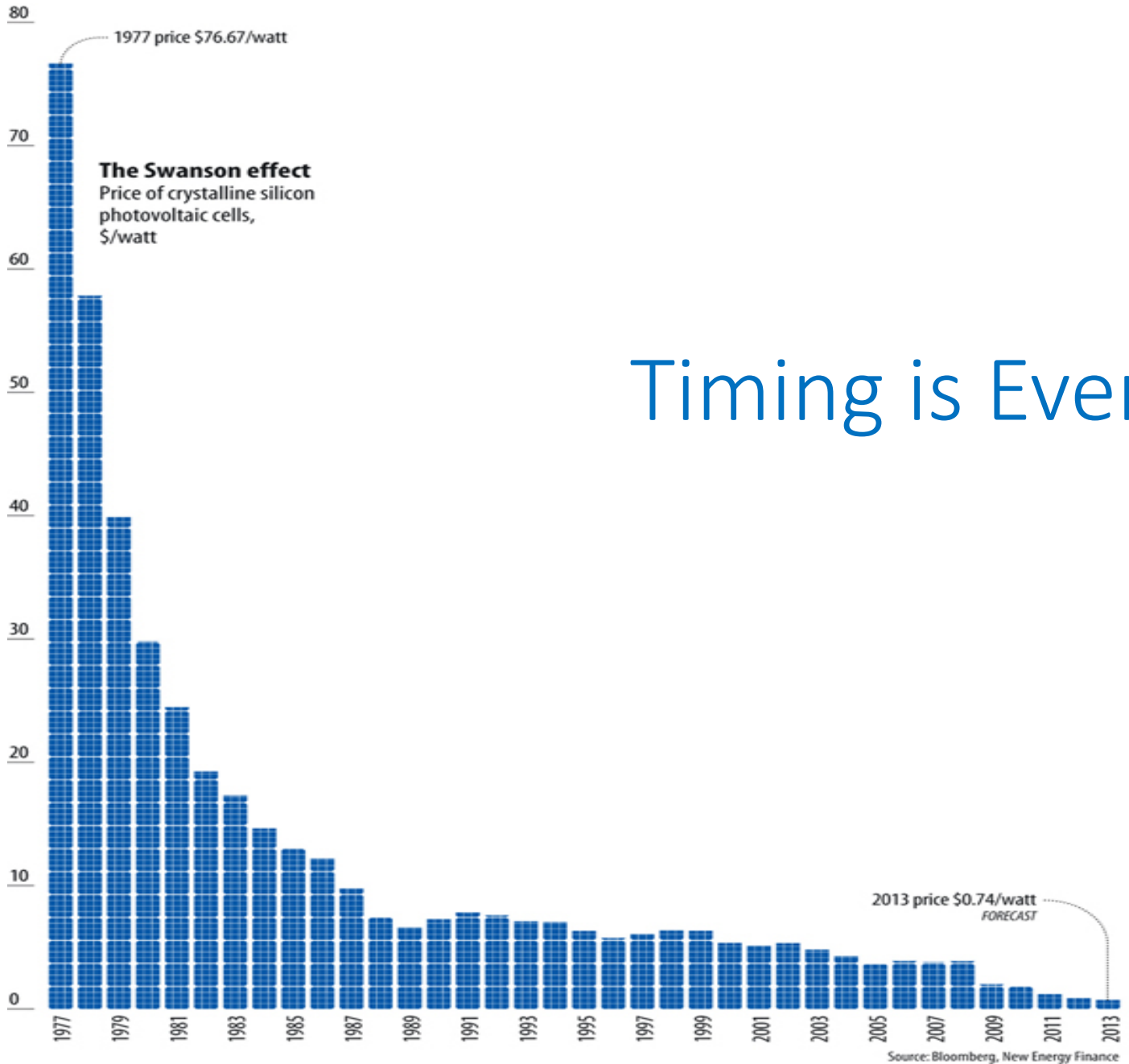
Expected annual energy output of DoS 1MW solar array = 1,175 MWh

Why Solar?

- Proven technology
- LOTS of examples to draw on
- Safe, quiet, low-impact
- Simple to operate, low costs
- Can be added to / expanded
- Easily installed & removed
- Well understood

  But not *that* well – still a draw
- Pairs favourably with storage

Timing is Everything



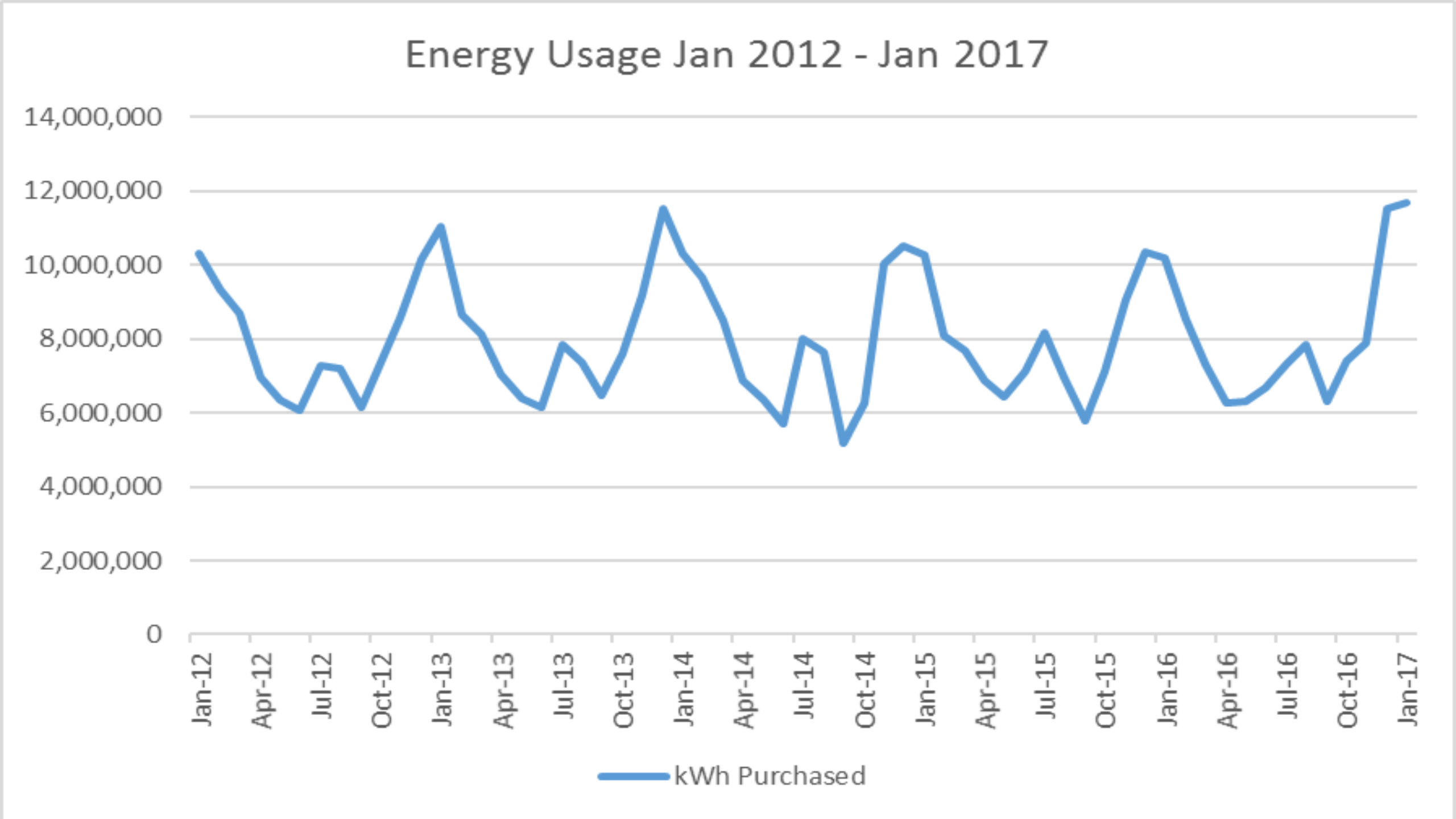
Project Benefits

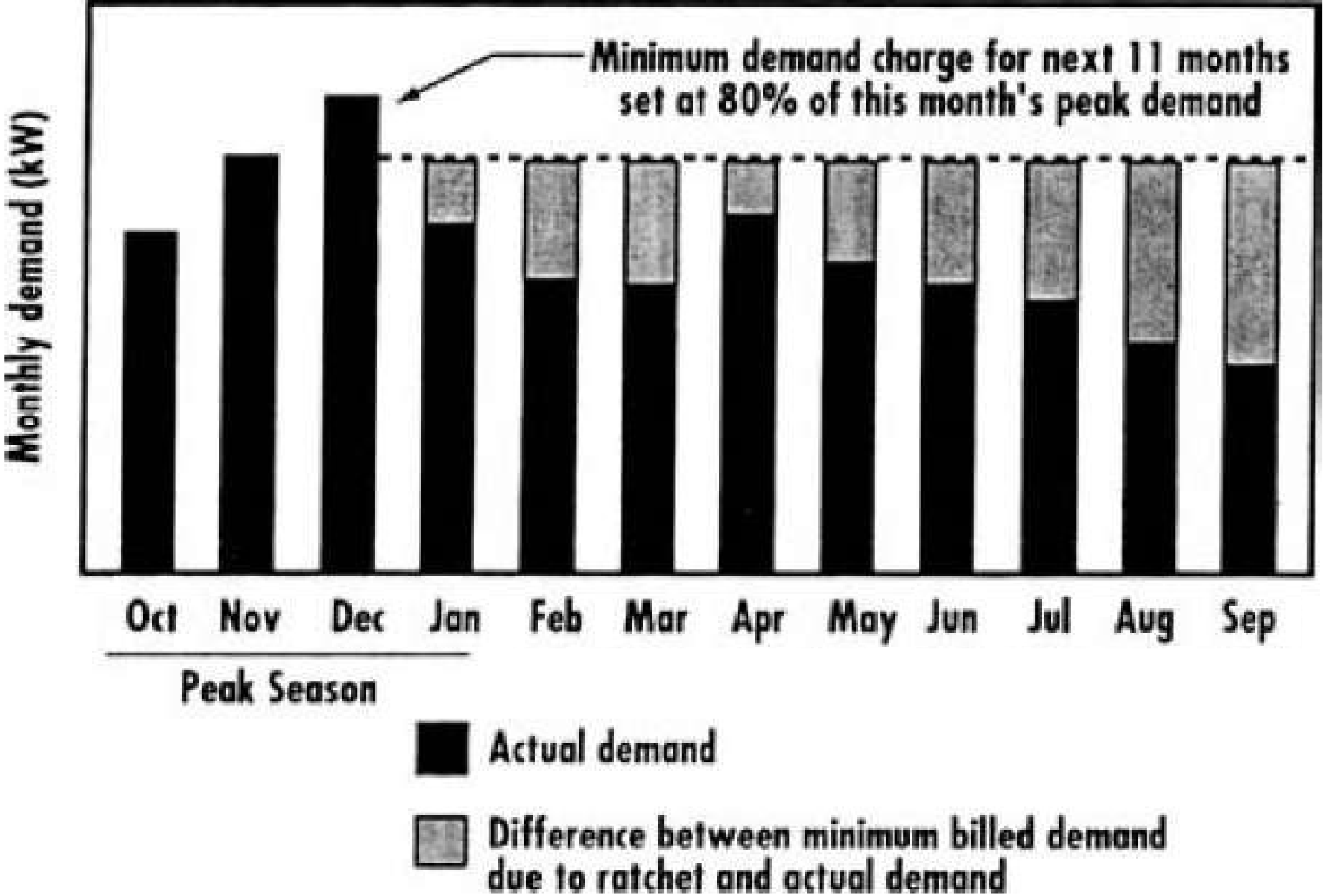
For Utility:

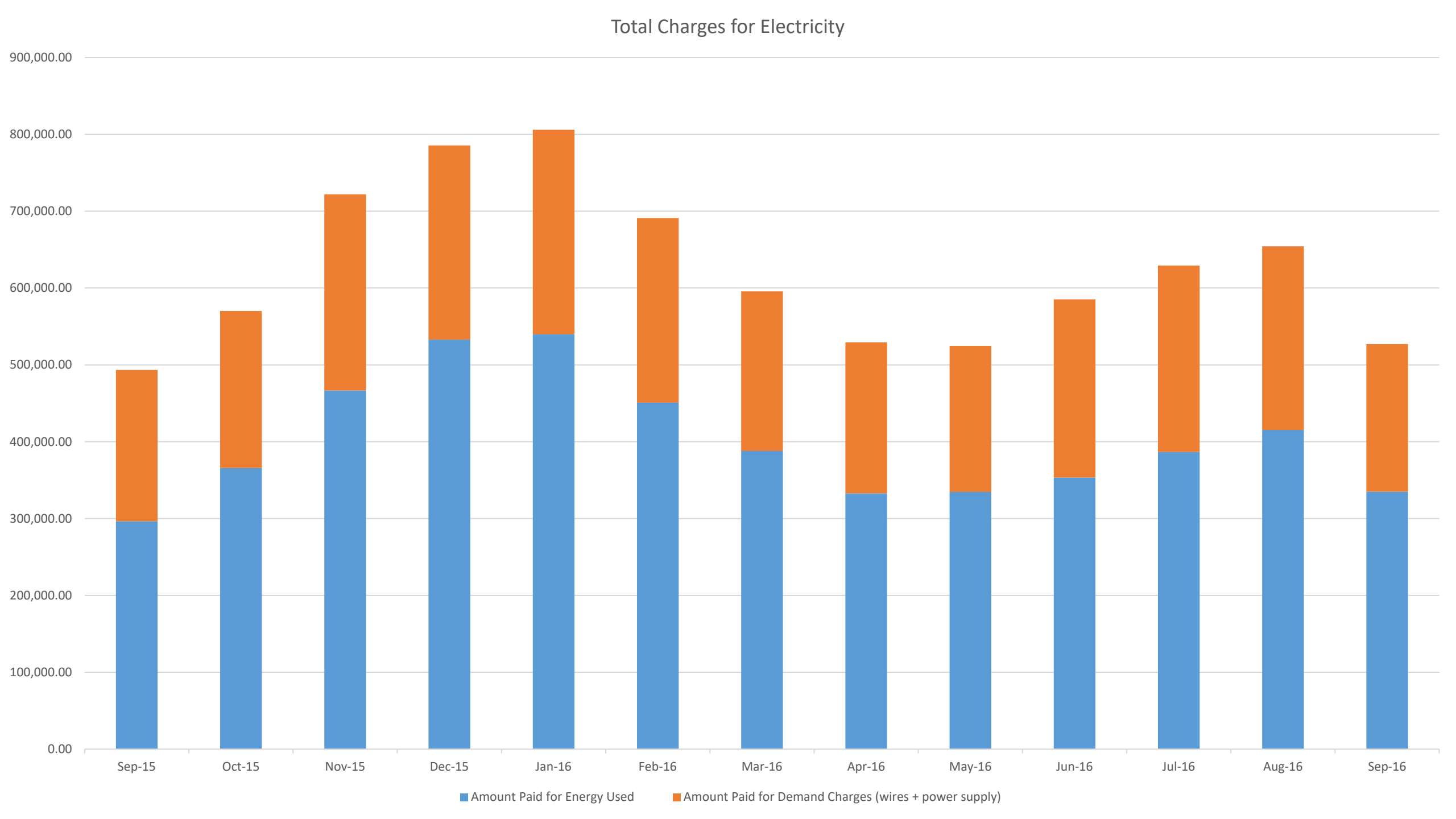
- Get experience with generation
  - Positioned to better adapt to changes to business model (DES)
  - Easier to capitalize on new opportunities
- System resiliency
- Peak shaving potential
- Predictable costs
- Positive customer relations
- Continue building on long history

For Community:

- Cost savings to ratepayers
- Economic diversification & reinvestment
- Reduce GHGs* & address climate change
- Reputation for leadership and innovation
- Educational opportunities for local schools & researchers
- Increased interest in visiting, working, and living in Summerland
- Potential for investment opportunity


Energy Usage Jan 2012 - Jan 2017
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
4,000,000
2,000,000
0
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
kWh Purchased

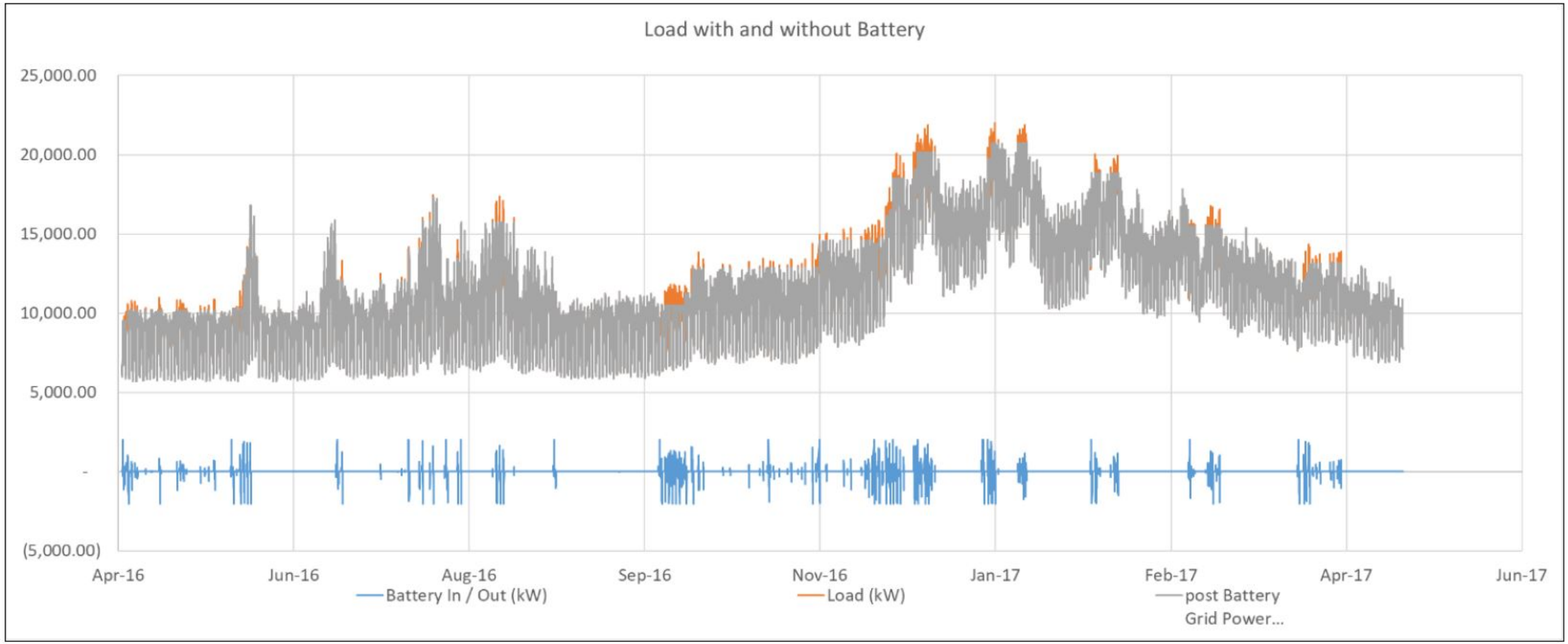

Minimum demand charge for next 11 months
set at 80% of this month's peak demand
Monthly demand (kW)
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Peak Season
Actual demand
Difference between minimum billed demand
due to ratchet and actual demand


Total Charges for Electricity
900,000.00
800,000.00
700,000.00
600,000.00
500,000.00
400,000.00
300,000.00
200,000.00
100,000.00
0.00
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Amount Paid for Energy Used
Amount Paid for Demand Charges (wires + power supply)

Battery Energy Storage

Potential Functions:

- Peak-shaving for tariff reductions
- System reliability enhancement
- Resiliency
- Voltage and frequency support


Load with and without Battery
25,000.00
20,000.00
15,000.00
10,000.00
5,000.00
-
(5,000.00)
Apr-16
Jun-16
Aug-16
Sep-16
Nov-16
Jan-17
Feb-17
Apr-17
Jun-17
Battery In / Out (kW)
Load (kW)
post Battery Grid Power...

Project Milestone Review

- Community Conversation: What is Summerland's Future in Solar?
- $100K Rural Dividend Funding Award
- Pre-feasibility Study
- $6M Strategic Priorities Fund Conditional Award
- System Impact & Interconnection Study
- Solar+Storage Project Financial Analysis
- Site Selection Process & Prime Potential Site Selected

Site Selection Process

System Impact & Interconnection Study Considerations:

- Solar resource
- Distribution system proximity
- Distribution system capacity
- Distribution system impacts
- Available area
- Topography

Site Selection Process

Additional Considerations:

- Zoning & OCP
- Social impacts
- Environmental impacts
- Geotechnical conditions
- Accessibility
- Module soiling

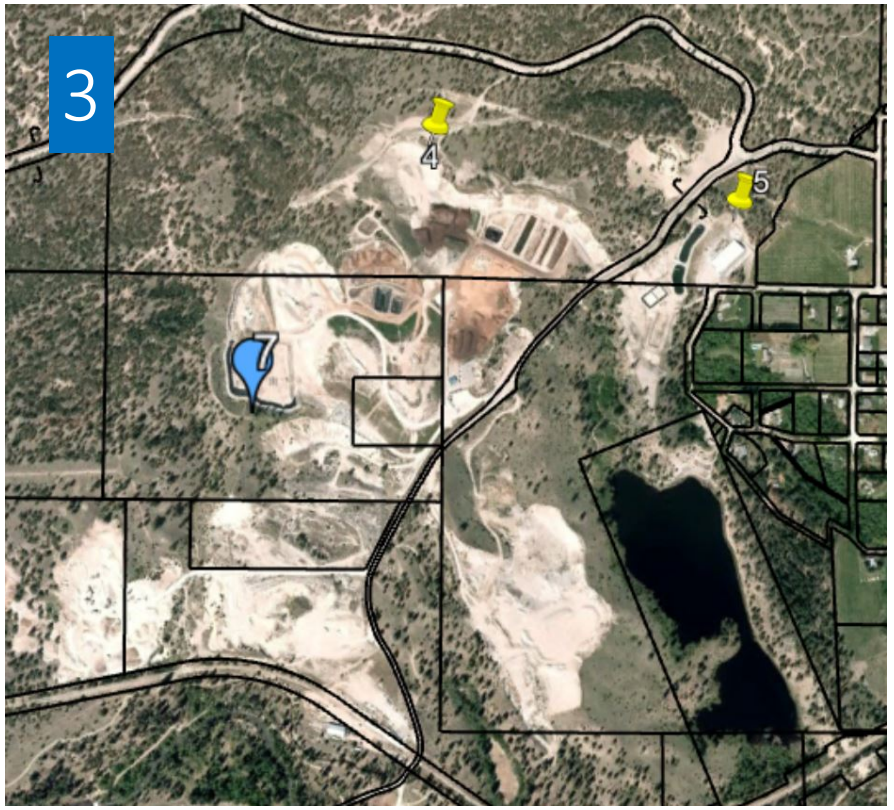
Site Selection Process

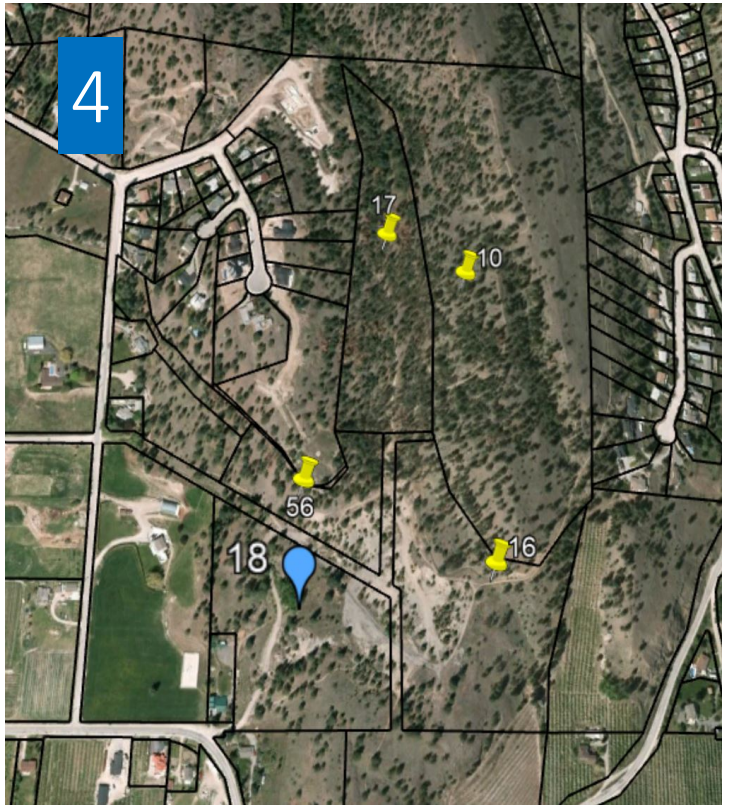
Further narrowed to those sites **not**:

- designated as Parks
- in perpetual slide monitoring area
- designated for Agriculture
- Adams Bird Sanctuary
- in active landfill area
- at north end of Garnet Valley
- reservoir
- KVR or Highway 97 right-of-way

Short-Listed Locations

1. Dunn St. Rental Houses
2. Buildings at Arena Complex Area
3. Lands Surrounding Landfill
4. Works Yard and Storage Area



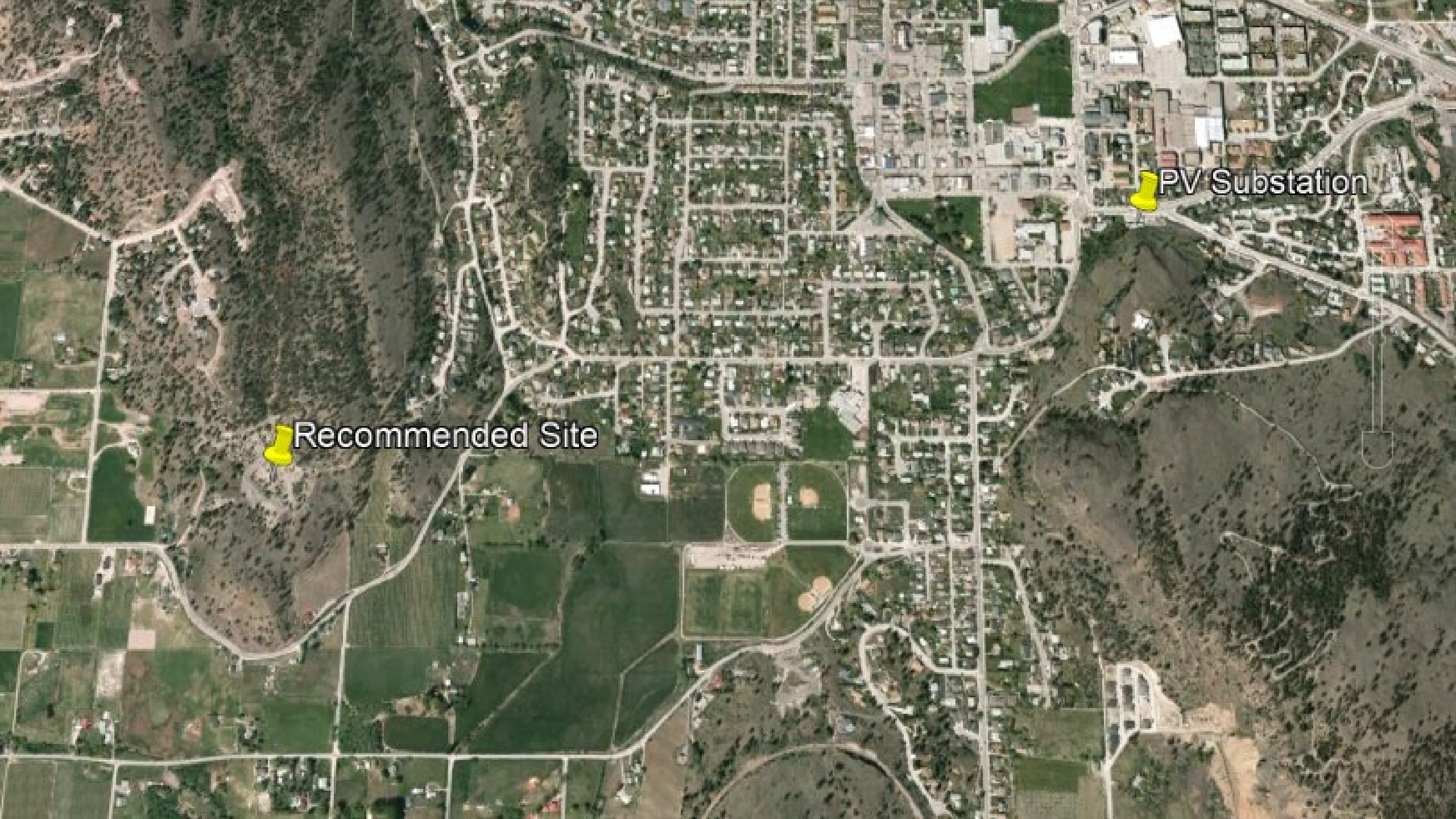


Advantages of Yard/Storage Site

- Previous disturbance / low environmental impacts
- Appropriate OCP designation
- Idle/vacant since 1970s
- Low visual impact
- Natural security
- Proximity to critical electric loads
- Possible co-benefits: remove garbage; remediate site; recreational amenities

Advantages of Site to Electrical Utility

- Proximity to substation
- Nearby to existing power lines
- Will interconnect to feeder with high reliability
- Close to Electric Utility office for servicing
- Close proximity to Fiber network
- Ample on-site space for large vehicle maneuvering & material storage


PV Substation
Recommended Site

Site Overview

Satellite Image

Previous Disturbance on Site

- Much of site has degraded pavement
- Area is mostly graded (flat)
- Excavated area creates ‘bowl’

- Due to previous industrial uses, may require soil contamination assessment

Opportunities for Cleanup of Site Area




Opportunities for Cleanup at Site and in Surrounding Area


DOMINION CUT OUT CO. LTD.
TORONTO ONT. CANADA
PAT. 1937
VOLTS 5000 AMP. 50
CAT. NO. 5213-2


DOMINION CUT OUT CO. LTD.
TORONTO ONT. CANADA
PAT. 1937
VOLTS 5000 AMP. 50
CAT. NO. 5213-2


Site Location
FOR ILLUSTRATION PURPOSES ONLY

Above, a typical PV support structure with penetrating foundations

Driven Pile

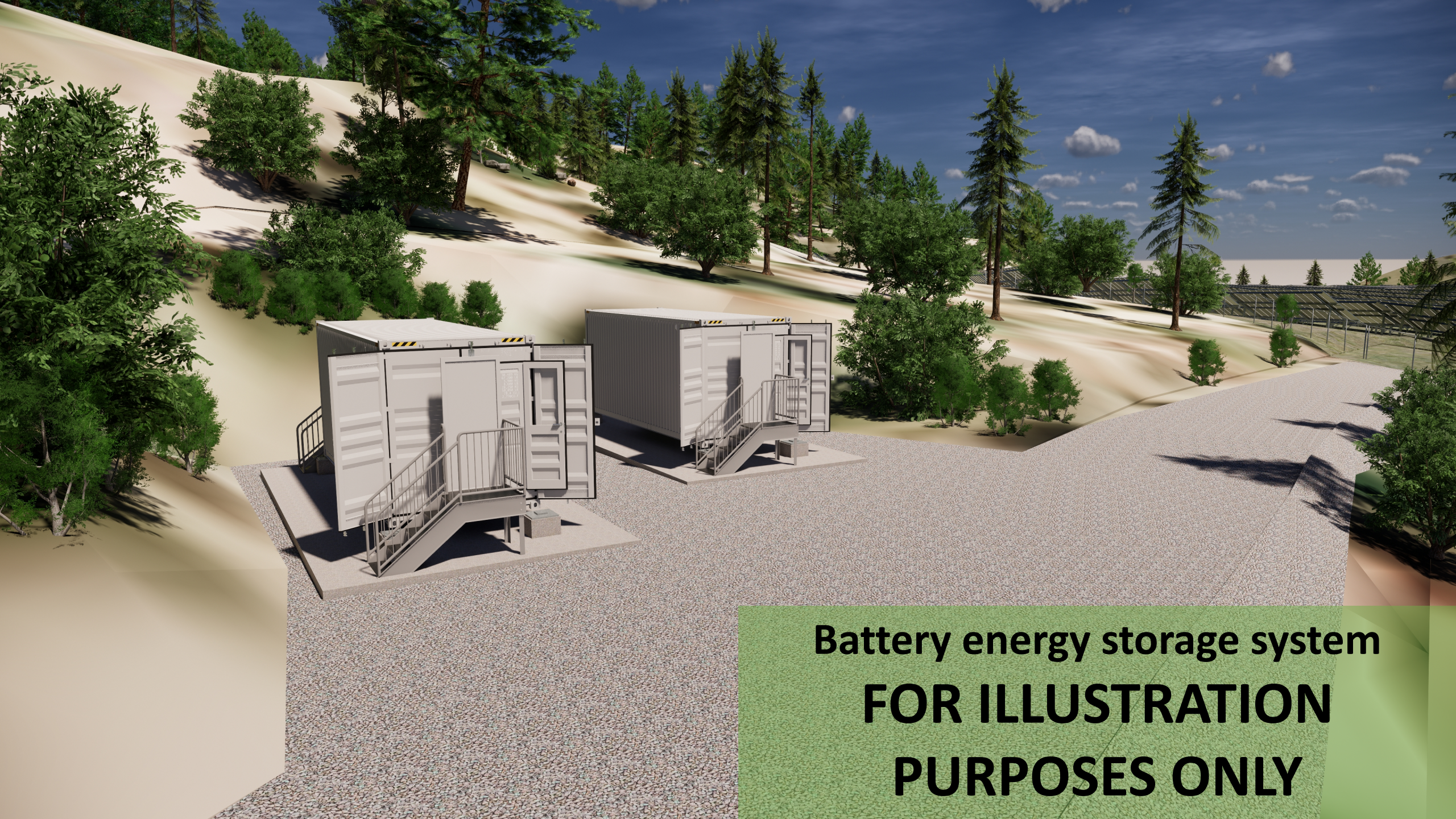
Earth Screw

Helical Pile

Below, a typical PV support structure with ballasted foundations

Ballasted

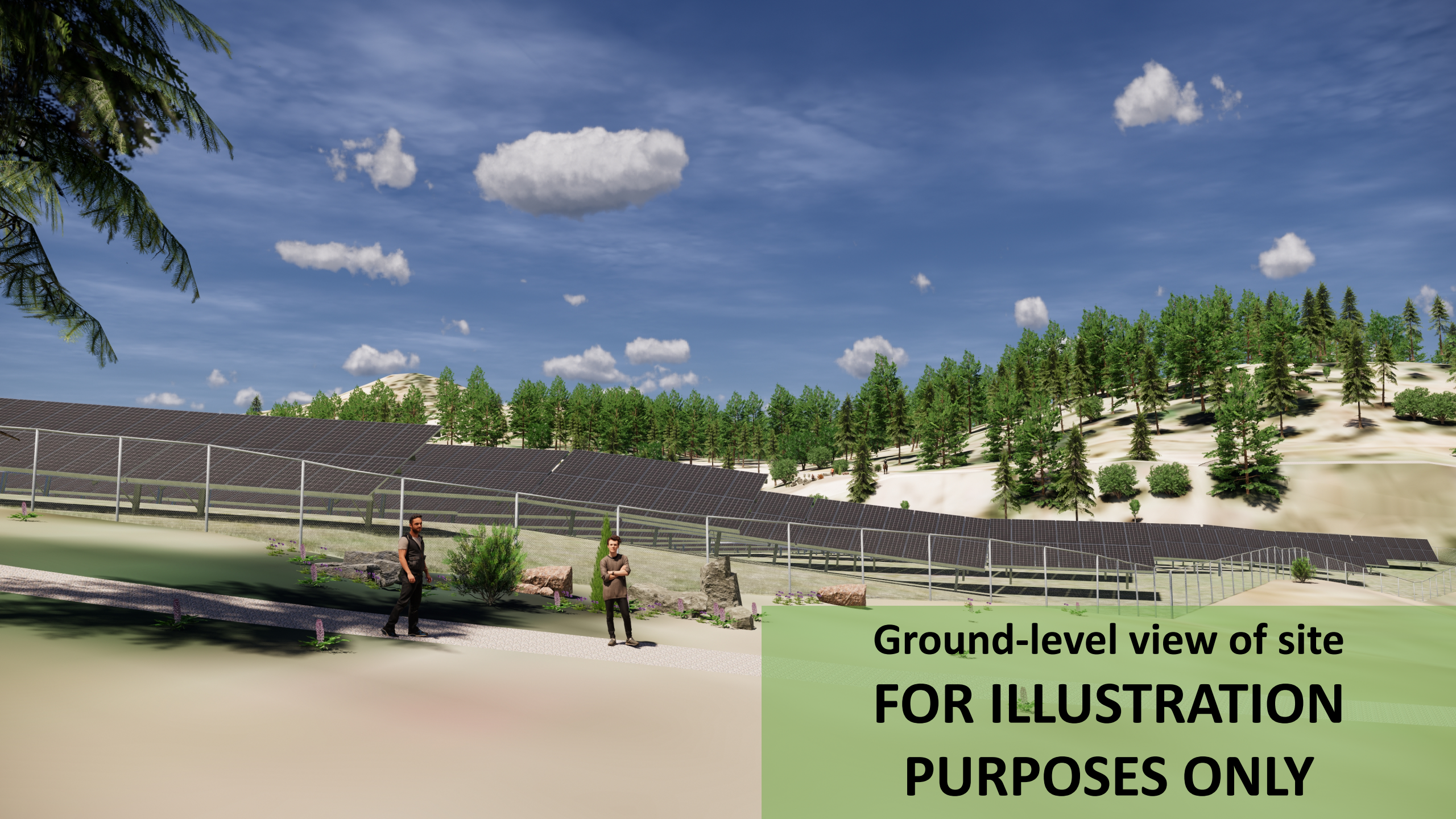
Foundations for Ground-Mounted Solar


Battery energy storage system
FOR ILLUSTRATION PURPOSES ONLY

Battery Energy Storage System (BESS)

- 2MW/4.5MWh
- Containerized
- Small footprint
- Able to assist with emergency operations
- Assist with peak shaving


Viewing Deck & Info Kiosk
Battery Energy Storage System
Existing Informal Trail Network
Parking Area
Site Overview
FOR ILLUSTRATION PURPOSES ONLY



Ground-level view of site

FOR ILLUSTRATION PURPOSES ONLY

Existing Trail Use

- Mixed use: dayhikers, cyclists, horseback riders
- Mostly informal and unsanctioned
- No formal amenities
- Some trails cross onto private property
- Trail Re-Development Plan recommended


View looking west toward site
FOR ILLUSTRATION PURPOSES ONLY


View looking east toward site
FOR ILLUSTRATION
PURPOSES ONLY


View looking southeast
FOR ILLUSTRATION PURPOSES ONLY


View looking northwest toward site
FOR ILLUSTRATION PURPOSES ONLY

Next Steps

- Qualified Environmental Professional completes site assessment
- Review of potential for First Nation values completed
- Confirmed if contaminated soils assessment required
- Solar monitoring station installed
- Geotechnical assessment awarded
- Community feedback collated

Future Milestones

- Secure $6M grant funding
- Choose panels, racking, and other solar components
- Finalize battery technology and select supplier
- Develop and issue RFP for Engineering, Procurement, Construction
    - Detailed design
    - Contracts
    - Site Preparation
    - Utility Upgrades
    - Installation
    - Interconnection
- Celebrate!

Ways to Be Involved

- Sign up for Solar Energy email list
- Complete a survey
- Share feedback by video
- Call or email staff
- www.summerland.ca/solar


DISTRICT OF
SUMMERLAND