Community Energy Association




Solar & Your Home

Things to Think About

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Community Energy Association

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www.communityenergy.bc.ca

Community Energy Association

- CEA is **charitable non-profit** society
- CEA supports local governments and communities across BC

Awareness & Recognition

- Workshops & Presentations
- Research & Publications
- Collaboration
- Climate & Energy Action Awards

Projects

- Planning
- Implementation
- Technology Acceleration
- Facilitation and management

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Community Energy Association Members

District of North Vancouver – naturally beautiful

West Vancouver

Richmond

The City of North Vancouver

Bowen Island Municipality

Metro Vancouver – Services and Solutions for a Livable Region

Township of Langley

Delta

New Westminster

City of Vancouver

Castlegar – happily ever after

Regional District of Kootenay Boundary

Montrose, British Columbia

Municipality of North Cowichan

Central Saanich

City of Nelson

Elkford – Wild at heart.

District of Summerland

Hub of the Kootenays – Salmo

City of Campbell River

Kamloops – Canada's Tournament Capital

Lumby

District of Ucluelet

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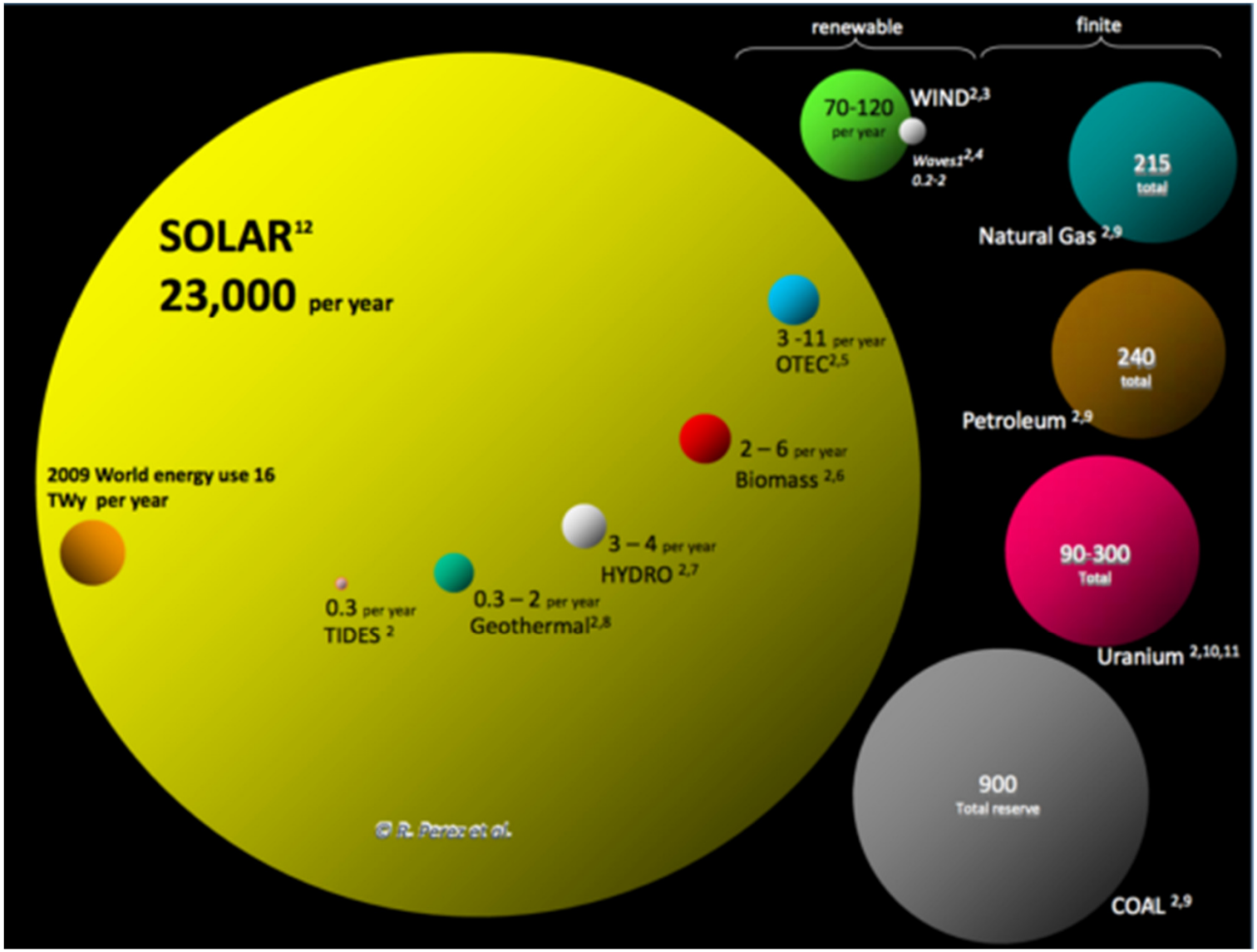
First things first… energy efficiency, then renewables

Source: Efficiency BC

Source: FortisBC

Solar – why is it so interesting?



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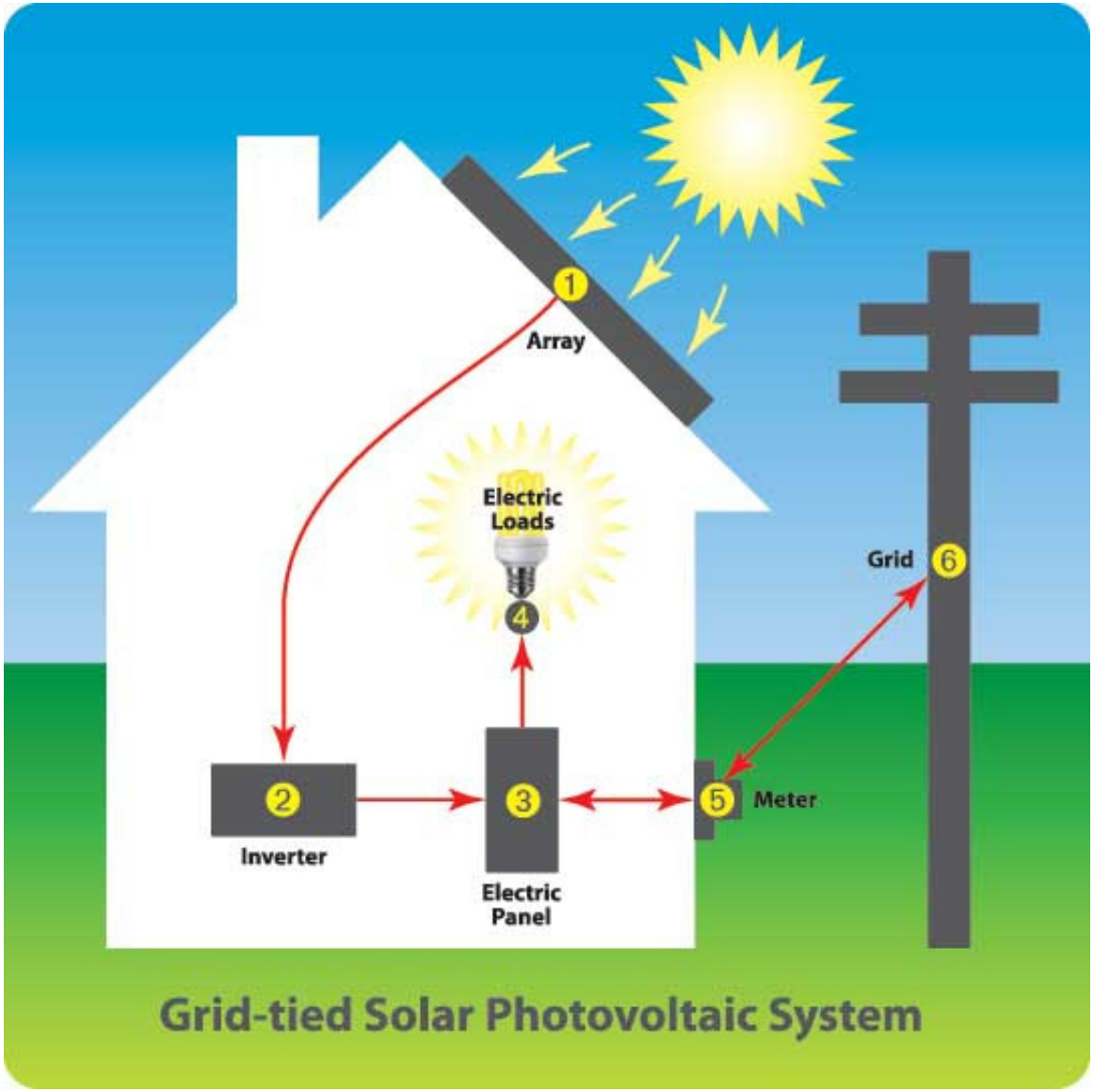
All figures in Terawatt-years

Solar photovoltaics – how do they work?

Photovoltaic = PV

===

Electricity generating



Source:
Energy Solution Providers

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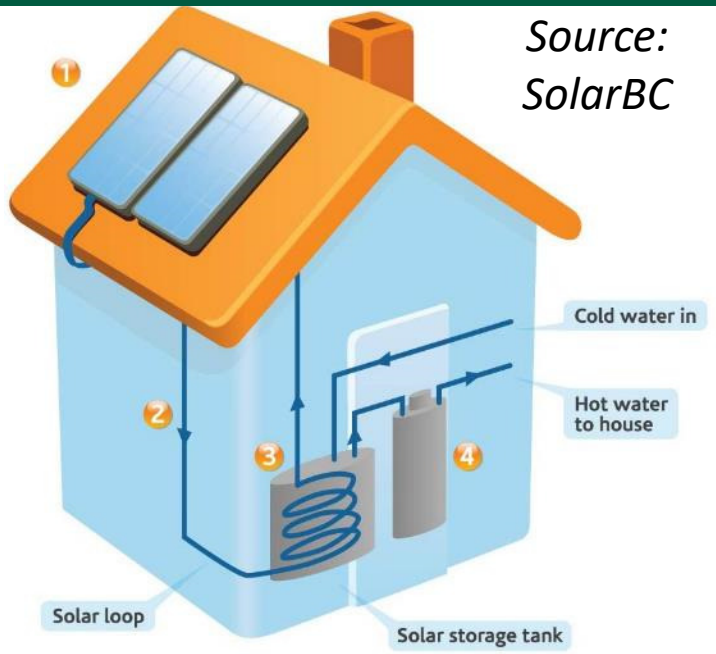
Remember solar hot water?

- Solar PV dropped rapidly in price
- It's not as flexible as solar PV (e.g. limited hot water tank capacity)
- If you want solar heated domestic hot water, probably better off with solar PV & an electric water tank or heat pump water heater
- But solar hot water still has applications, e.g.: pools, some commercial applications

Source: SolarBC



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Solar photovoltaics – why are they so interesting?

1. Abundant energy source

2. Rapidly falling costs

3. Rapidly increasing installations worldwide

Source:
Solar City

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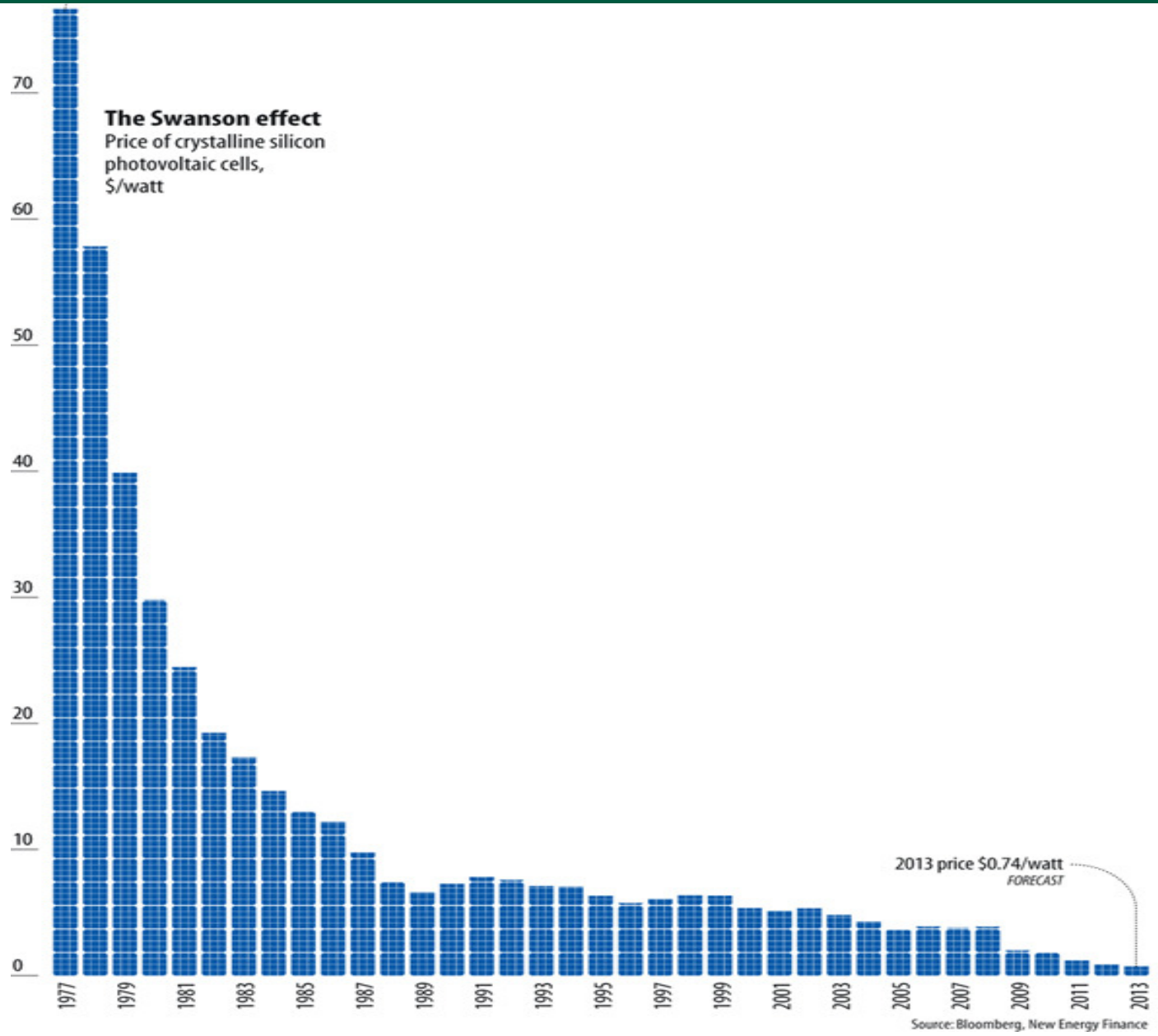
Solar photovoltaics – why are they so interesting?



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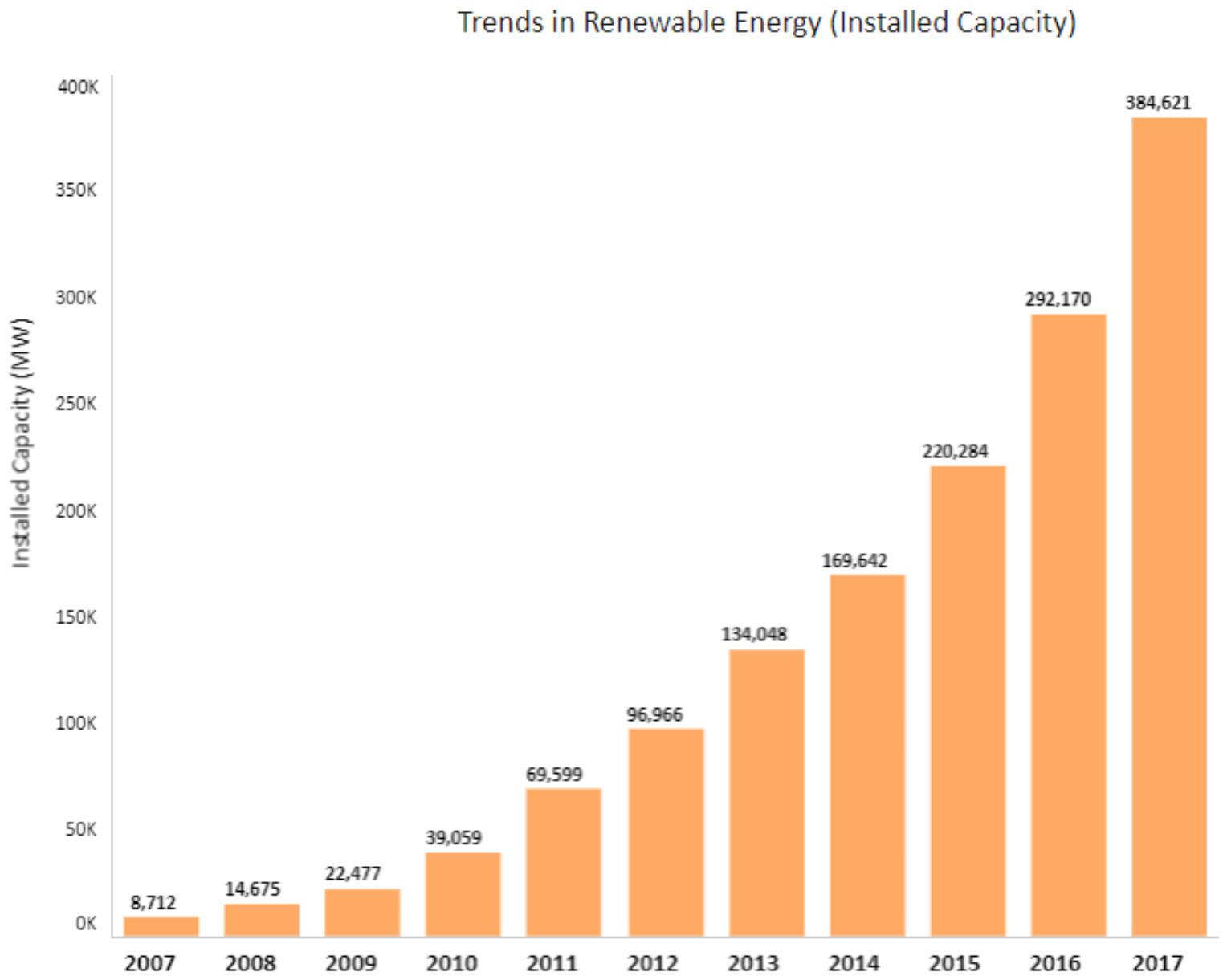
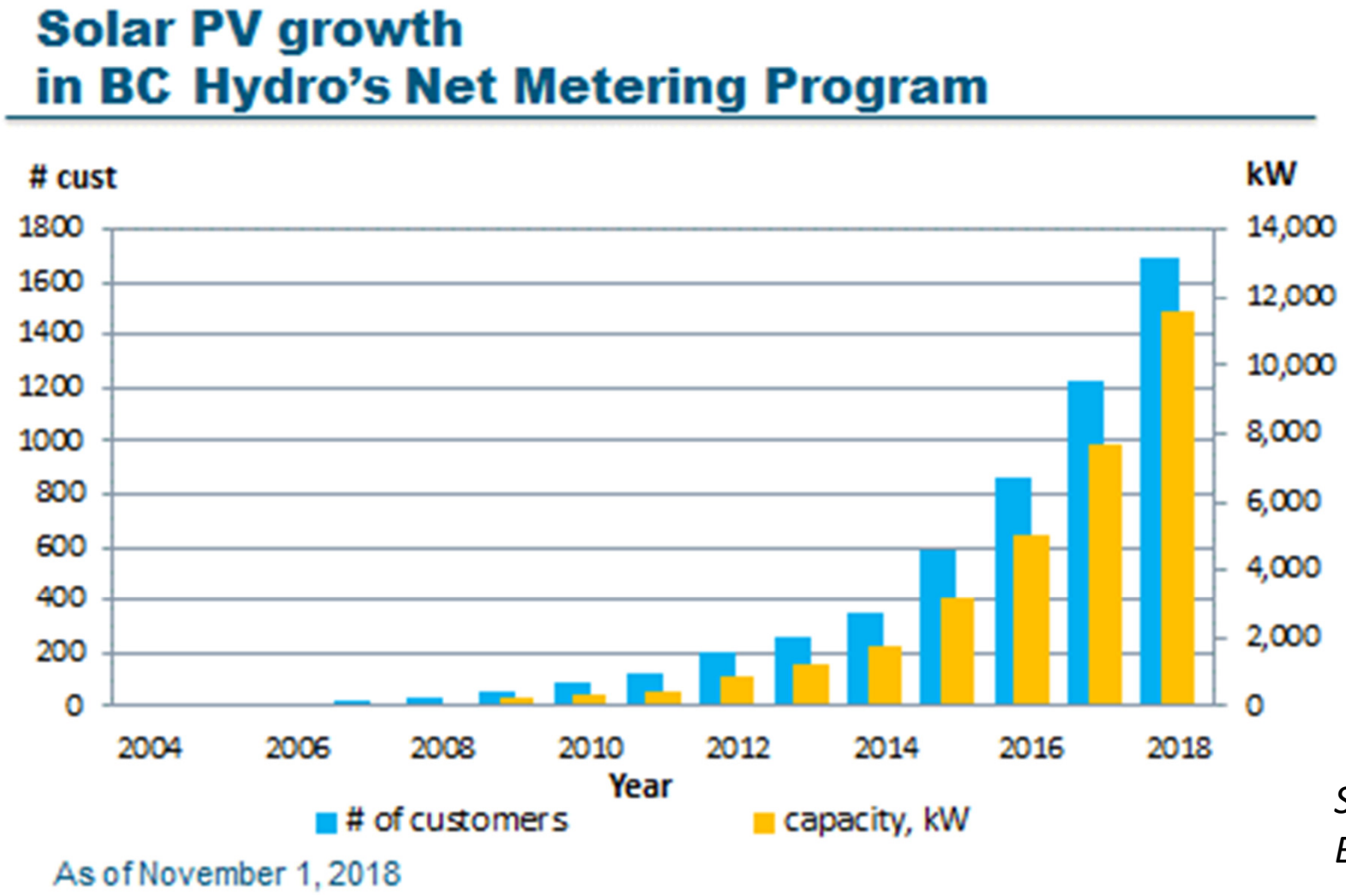


Source: International Renewable Energy Agency

Solar photovoltaics – why are they so interesting?



Source: BC Hydro

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Rising electricity rates

FortisBC, between 2012 – 2018:

- Tier 1: 23% increase
- Tier 2: 30% increase

Plus tax

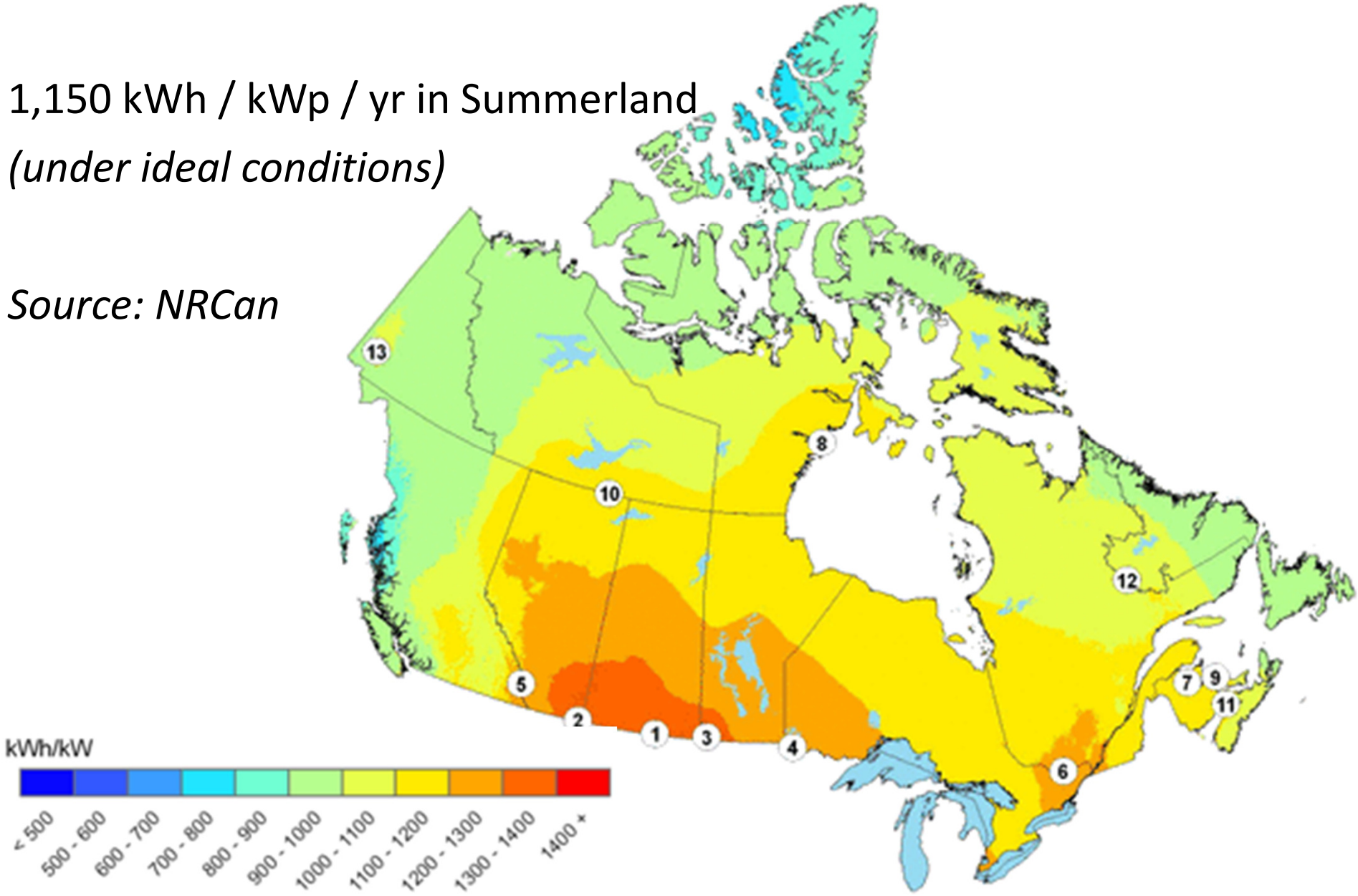
Source:
Solar Now

Summerland Solar Resource

1,150 kWh / kWp / yr in Summerland

(under ideal conditions)

Source: NRCan



The big question

Soon, Summerland Council will discuss whether to adopt a:

- net *metering* approach, or
- a net *billing* approach,

to integrating distributed solar PV systems for the Summerland electrical utility.

Which will Summerland choose?

Residential solar PV

- Can typically meet 30-100% of a home's annual electricity needs
  - Average home in Summerland uses 13,200 kWh/yr
- $7,000 – 30,000 cost (about $2.25-3.50 per W, installed)
- Requires virtually no maintenance
- Net *metering*: generates a return of around 5-7%, at today's electricity rates. Size for max. of annual elec consumption.
- Net *billing*: more complex, depends on time of electricity use. May generate return of around 5% or lower. Size for max. daytime elec consumption in summer

What to look for on your home

- South-facing (SE to SW), unshaded roof
  - Note: if net *billing* approach is adopted and you have a.c., facing panels more to the west will likely give a better business case
- Roof in good condition
- At least 200-500 square feet of available roof space (typical)

Source: Solar Now

Sizing your system – net ***metering*** scenario

- Look at your annual electricity consumption

- Consider future load changes
  - Changes to household size
  - Future efficiency measures
  - Air conditioning
  - Hot tub
  - Electric vehicle purchase

- Take your annual consumption figure, divide by 1,150 kWh (or lower figure if shaded). This gives your maximum recommended system size in kW

- For most people, finances will dictate a smaller system size than this

Sizing your system – net ***billing*** scenario

- Look at your typical summer daytime electricity consumption (e.g. a.c.)
  - May be 3-5 kW
- Consider future load changes
  - Air conditioning changes
  - Changes to usage patterns, e.g. working from home, retirement
  - Future efficiency measures
  - Other?
- Take your typical summer daytime instantaneous consumption figure. This gives your maximum recommended system size in kW
- Might want to think about batteries

Want to help solve climate change, but don't want to create other problems?

- Google: Solar Scorecard
- Considers:
  - Lifecycle impacts, e.g. toxicity
  - Equitable environmental & labour standards
  - Working towards reducing toxic chemicals in PV module manufacturing
- Ask installation firms what panels they use

www.

2016-17 SOLAR SCORECARD

SVTC

SUNNY
PARTLY CLOUDY
RAINY

	Company	Extended Producer Responsibility	Emissions Reporting	Worker Rights, Health and Safety	Supply Chains	Module Toxicity & Materials	Energy & GHGs	Conflict Minerals	Water	2016-17 OVERALL SCORE
	Maximum Score	15	15	15	15	10	10	10	10	100
2016-17 Leaders	SunPower	15	15	15	15	10	8	10	10	98
	SolarWorld	14	15	15	15	8	10	10	8	95
	Trina	13	14	15	15	8	10	10	10	95
	Aleo	12	14	15	15	8	8	10	10	92
	Jinko	13	11	15	15	10	8	10	8	90
	First Solar	15	11	15	11	2	10	10	8	82
	Hanwha Q CELLS	8	11	15	15	0	8	10	10	77
	Mitsubishi	3	11	9	11	8	10	10	10	72
Above Average	Kyocera	3	5	13	11	2	8	10	3	55
	Motech	6	0	7	11	0	8	10	10	52
	Panasonic	0	9	7	10	0	8	10	8	52
	REC	13	2	9	10	2	0	10	5	51
	WINAICO	5	0	9	10	0	6	10	10	50
	Astronergy	10	0	9	10	2	8	10	0	49
	Avancis	13	0	9	10	2	0	10	0	44
	AUO	10	0	2	10	0	8	10	0	40
	LG	3	0	2	11	0	6	10	8	40
	JA Solar	11	1	9	6	0	0	10	0	37
	Yingli	10	0	9	0	0	8	10	0	37
Below Average	Calyxo	13	0	2	0	0	0	10	0	25
	BYD	5	0	4	0	0	0	10	0	19
	Talesun	7	0	2	0	0	0	10	0	19
	China Sunergy-Csun	3	0	4	0	0	0	10	0	17
	Longi Solar	0	0	2	1	0	3	10	0	16
	Gintech	3	0	2	0	0	0	10	0	15
	Hanergy	3	0	2	0	0	0	10	0	15
	Hyundai	3	0	2	0	0	0	10	0	15
	Suntech	3	0	2	0	0	0	10	0	15
	Renesola	0	0	2	0	2	0	10	0	14
	Silfab	2	0	2	0	0	0	10	0	14
	Boviet Solar	0	0	2	0	0	0	10	0	12
	ET Solar	0	0	2	0	0	0	10	0	12
	Hareon Solar	0	0	2	0	0	0	10	0	12
	Risen	0	0	2	0	0	0	10	0	12
	Solar Frontier	0	0	2	0	0	0	10	0	12

From idea to installation to savings

- STEP 1 – conduct sensible energy efficiency measures, as possible. Go to / contact Efficiency BC

- STEP 2 – preliminary solar self assessment:
  - Assess your roof for PV (condition, shading, etc.)
  - Assess your finances
  - Assess your annual electricity consumption (net metering) ***or*** typical summer daytime instantaneous electricity consumption (net billing)
  - Consider future electricity consumption changes

From idea to installation to savings

- STEP 3 – contact solar PV installation firms for:
  - System size confirmation
  - System design (ask about aesthetics)
  - Quotes / assessment (free if possible)
  - Ask about:
    - Do you subcontract, or do the work yourself
    - Insurance – liability & WCB (Workers Compensation Board)
    - Warranties on components, & system (e.g. 10 yrs panels, 5 yrs inverters)
    - Experience (no. of systems, years in business, etc.)
    - References (local, & several, & similar projects)
    - Training / certification
    - Will they do local government permit and grid-connection applications
    - Timeframes
    - System maintenance (e.g. inverter replacement)
    - Tracking power production
    - Potential future system expansion
    - Panel efficiency (15-18% fairly typical)
    - Panel toxicity etc. (Solar Scorecard)
    - Dispute resolution

From idea to installation to savings

- STEP 4 – compare quotes received (hopefully 2-4?), plus experience / references / reputations, warranties, etc.

- STEP 5 – check the business case yourself (est. elec generation, rates, potential increases in rates)

- STEP 6 – proceed

Source:
Chelsfield Solar

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A few words on batteries…

- Currently expensive (e.g. $10,500)
- No time of use billing in Summerland
- Infrequent power disruptions in Summerland
- But can provide emergency power source / off-grid potential

BUT, if net *billing* approach is adopted:

- Allows energy to be stored to offset consumption. May improve business case

Under net *metering* approach:

- Better to use the grid as your “battery”

Source: Tesla

Questions?

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