



**Business Presentation 100116** 



# Safe Harbor Statement

This presentation contains forward-looking statements, including statements regarding the company's plans and expectations regarding the development and commercialization of our technology. All forward-looking statements are subject to risks and uncertainties that could cause actual results to differ materially from those projected. The forward-looking statements speak only as of the date of this presentation. The company expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any such statements to reflect any change in the company's expectations or any change in events, conditions or circumstances on which any such statements are based.

# The Energy Problem





- 39% of global CO2 emissions
- 43% global power demand growth by 2040.
- 78% of worldwide energy generation still carbon based fuels by 2040



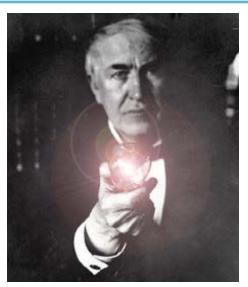
- 20% of global CO2 emissions
- Tougher emissions regulations
- Despite excitement in EVs, only 3% of vehicles by 2025
- Battery economics remain a barrier for EVs

What is needed is cheap, non-polluting, fast, easy to site, globally available, 24/7 power; now



# About Brilliant Light Power

- Reinventing electricity, independence of being completely off grid
- New, sustainable, nonpolluting energy
- Technology and science validated by independent third parties
- Extensive proprietary methods and systems
- Electricity company, sales via lease agreement, no metering
- Partnership & outsource business model
- Transitioning from research to reality
- Profound implications for electric power accessible, affordable, clean

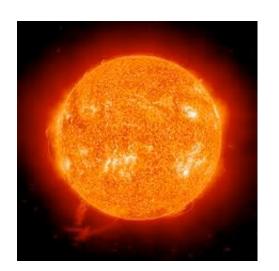


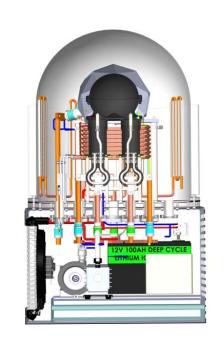




## The Solution: SunCell®

- Continuous power source, developed with proprietary technology
- Non-polluting: by-product is harmless lower energy state of hydrogen called Hydrino®, lighter than air, vents to space
- System is sealed with H<sub>2</sub>O fuel injected with nonreactive, recirculated silver, absolutely safe materials and operation
- Capital cost estimated at \$50 to \$100 per kW at production power & scale, versus \$3,463 for solar
- No Metering: Electricity sold at about \$0.05 per kWh via a per diem lease fee.
- Low operating cost, only consumable is minimal amounts of water
- Scalable from 10kW to 10 MWs
- Initially stationary, developing to motive
- Field test in 1H 2017
- Commercial launch in 2H 2017





### SunCell Economics



Current Annual Gross Earning Capacity of Any Electrical Generator:

o \$1/W

Capital Cost:

o \$60/kW

Life Span:

o 20 years

Capital Cost Annually:

o \$3/kW

Solar Capital Cost (2013):

o \$3,463/kWa

Maintenance Cost:

o \$1.20/kW

**Generation Cost:** 

o \$0.001/kWh



ahttp://www.nrel.gov/analysis/tech\_lcoe\_re\_cost\_est.html



## SunCell® CPV Cost Drops Dramatically with Scale

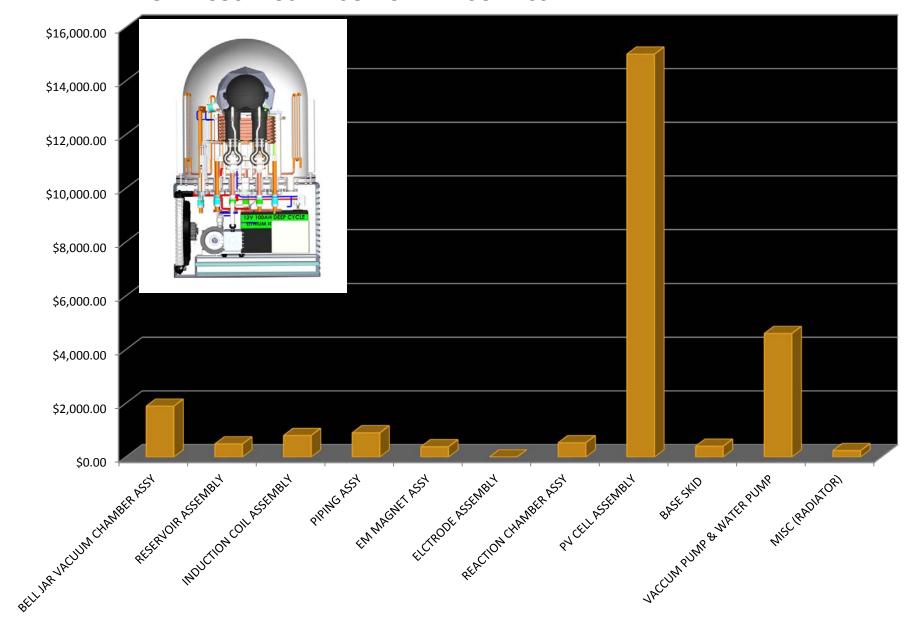
- For SunCell units of ~>100 kW, the cost per kW is essentially that of the PV converter component.
- At a volume of ~100 MW/yr, the SunCell® CPV converter is estimated to cost less than \$75 per kW (2000 Suns concentration, 30% efficiency) and less than \$20 per kW (10,000 Suns concentration)
- At 10 GW annual production which is equivalent to the global annual deployment of c-Si solar, the cost of SunCell® CPV converter is estimated to cost less than \$32 per kW (2000 Suns concentration) and less than \$6 per kW (10,000 Suns concentration)

(Kelsey Horowitz, "A Bottom-up Cost Analysis of a High Concentration PV Module", CPV-11, 2015; NREL/PR-6A20-63947)





#### **TOTAL COST 250KW SUN CELL AT SUB ASSEMBLY LEVEL**



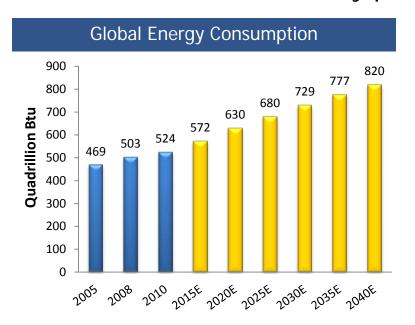
# COST ANALYSIS FOR FIRST OF A KIND 250KW (2000 Suns)

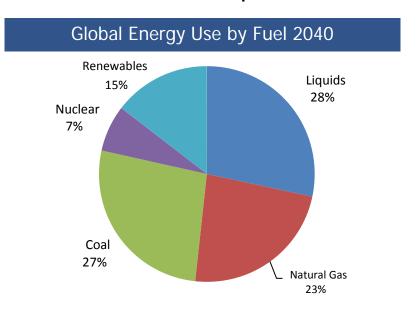
250KW SUN CELL COST ANALYSIS						
DESCRIPTION	TOTAL COST AT SUB ASSY LEVEL					
BELL JAR VACUUM CHAMBER ASSY	\$1,891.47					
RESERVOIR ASSEMBLY	\$484.17					
INDUCTION COIL ASSEMBLY	\$800.00					
PIPING ASSY	\$900.00					
EM MAGNET ASSY	\$380.00					
ELCTRODE ASSEMBLY	\$0.00					
	\$530.00					
REACTION CHAMBER ASSY	\$15,000.00					
PV CELL ASSEMBLY	\$400.00					
BASE SKID	\$4,600.00					
VACCUM PUMP & WATER PUMP	Ş4,000.00					
MISC (RADIATOR)	\$236.00					
DESCRIPTION	TOTAL COST 250KW					
TOTAL COST 9	\$25,221.64					





- \$8 trillion~ expended on total fossil fuels globally in 2013.
- \$1 trillion+ annually for energy infrastructure through 2030
- Energy demand has nearly doubled over the past 20 years, projected to increase 56% from 2010 to 2040
- Renewable energy to satisfy only ~15% of demand by 2040.
- Wind and solar are relatively poor sources of baseload power

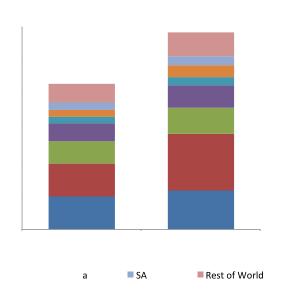








- \$3.5 trillion~ global market at \$0.12 per kWh at site
- \$1.5 trillion addressable market for SunCell at breakthrough rate of about \$0.05 per kWh
- 28% demand increase by 2025
- SunCell expected to expand electrical use, fueling new growth
- SunCell estimated generation cost ~\$0.001 per kWh



160 140 120 100 80 60 40 20

Coal

7%

Nuclear

Figure ES.1: LCOE ranges for baseload technologies (at each discount rate)

CCGT

Coal

10%

CCGT

3%

Nuclear

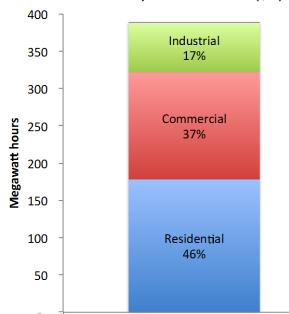
CCGT

## **US** Electricity



- \$387~ billion market
- Average consumer price of \$103 per MWh, double SunCell goal of \$50 per MWh
- US residential larger percentage than Global markets
- SunCell breaks entry barriers:
  - Always on power, low capital cost, low operating cost, huge power density, no pollution
  - Off grid without corresponding regulations or transmission and distribution costs of >\$38 per MWh

#### US Electricity Revenue 2015 (\$B)



#### Levelized Avoided Cost of Electricity (LCAE) New Generation

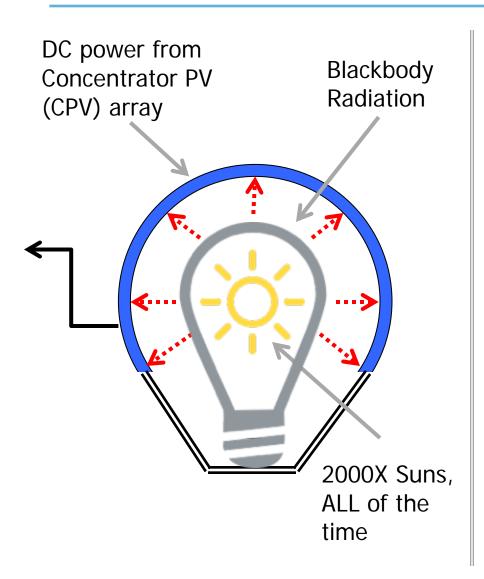
Advanced	NG w/	NG w/	Advanced	Solar PV
Coal	Combined Cycle	Advanced CC	Nuclear	
\$70.9	\$71.4	\$71.4	\$72.1	\$80.4

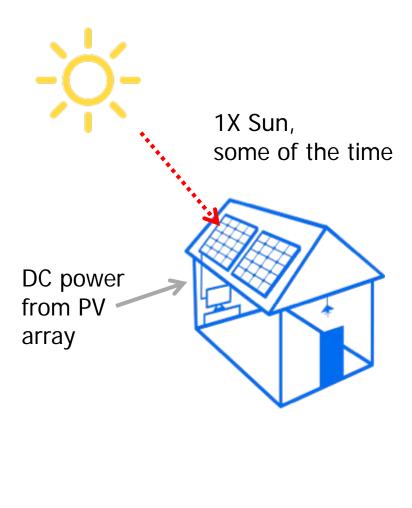
#### **Levelized Cost of Electricity (LCOE)**

P	Advanced	NG w/	NG w/ Adv.	Advanced	Solar PV	SunCell
	Coal	Combined Cycle	CC	Nuclear		
	\$116	\$75.2	\$72.6	\$95.2	\$114.3	\$50-70

## SunCell® vs Solar PV







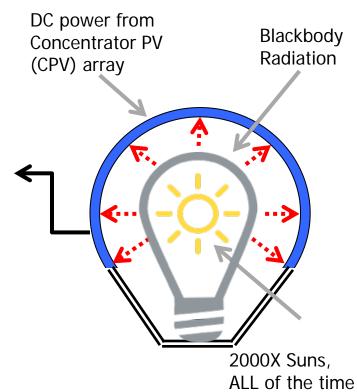


# **Product Development Foundation**

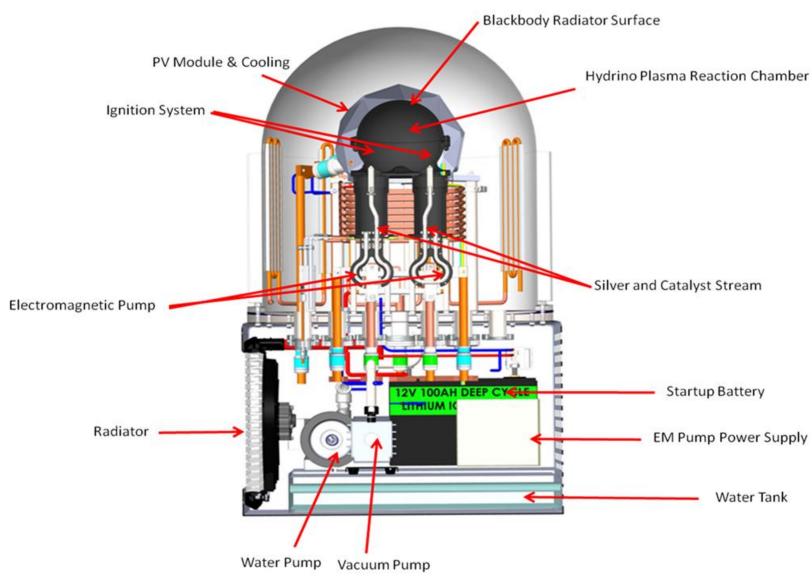
- SunCell converts the short wavelength light to a blackbody radiation, resembles the emission of the Sun
- Blackbody temperature is adjusted to more closely match the response spectrum of commercial PV
- Rapid, low cost development approach

#### **Established Foundation**

- Theory solved, IP filings
  - Light source demonstrated
    - Certified by five validators
    - Four confirming methodologies
- Advanced thermophotovoltaic (CPV)
  - Suppliers selected
  - CPV cell design
  - Dense receiver array design
- Black body radiator design
- Costed bill of materials
- Engineering Design Drawings
  - Light source prototypes

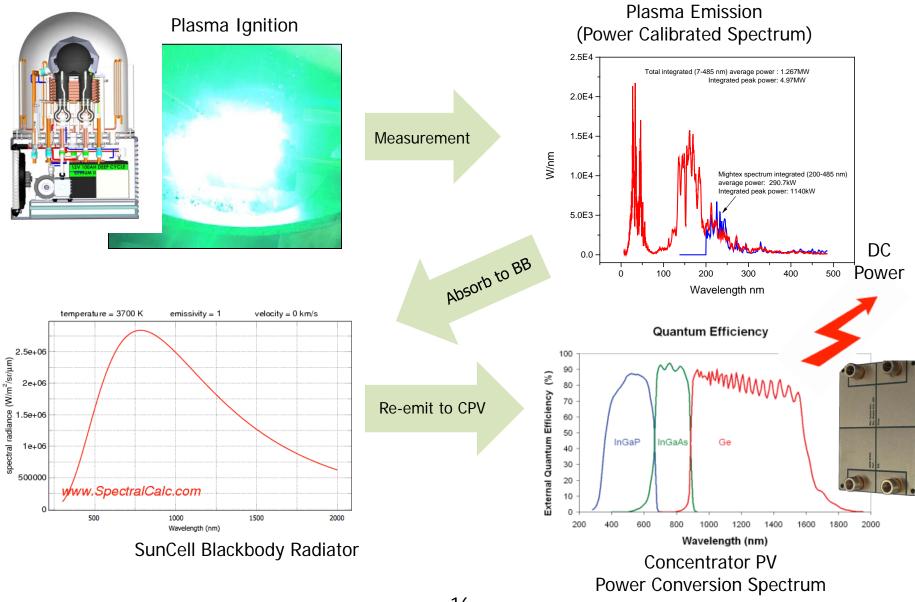






## Spectral Emission in the High Energy Region Only



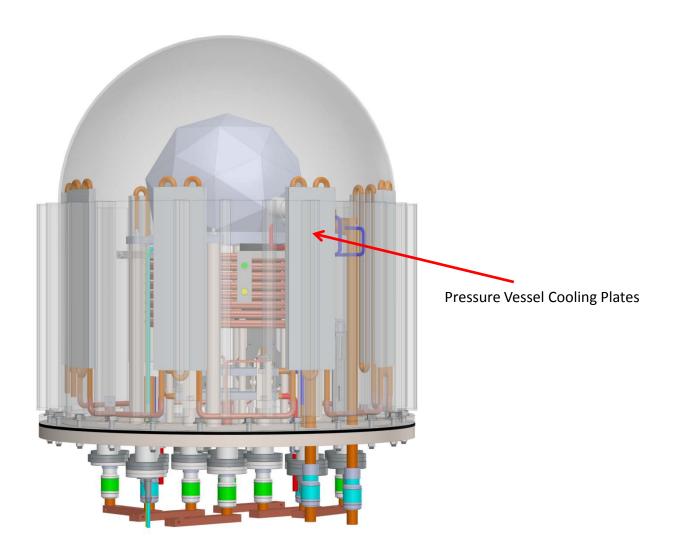




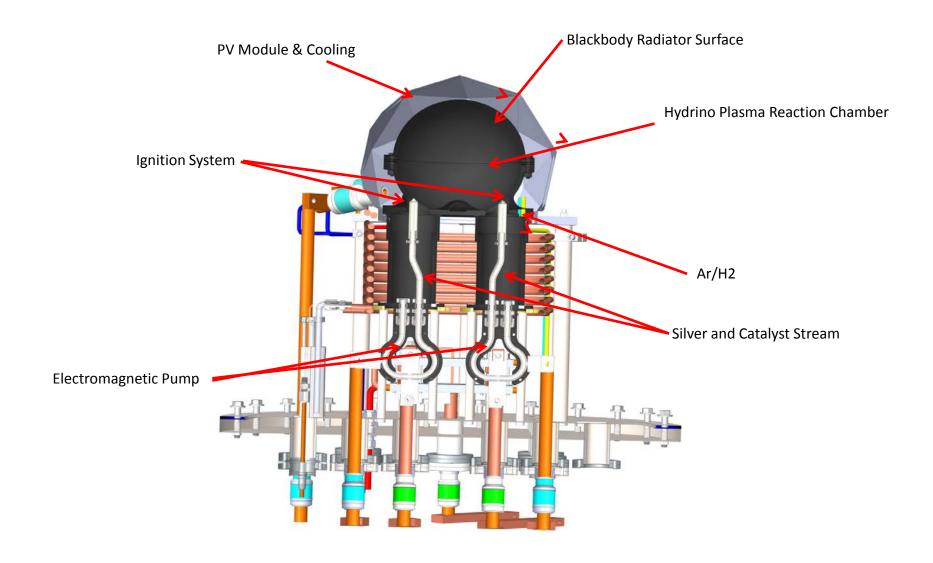
# Engineering



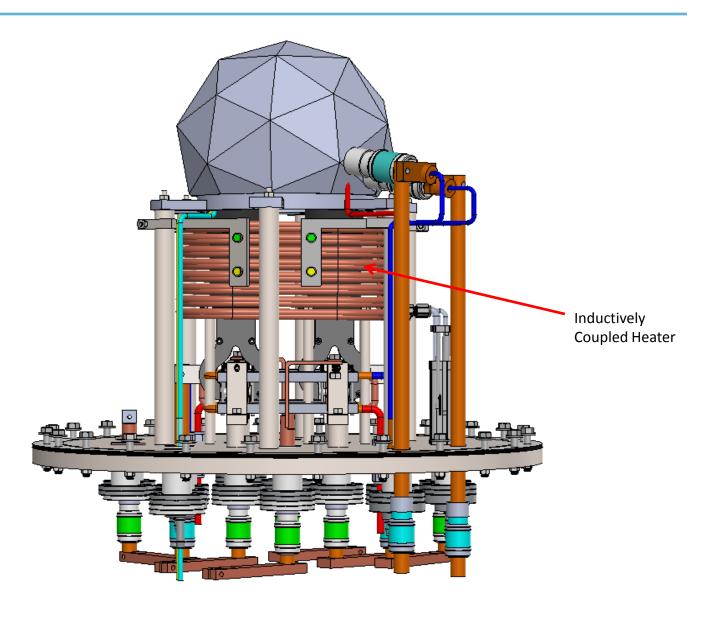




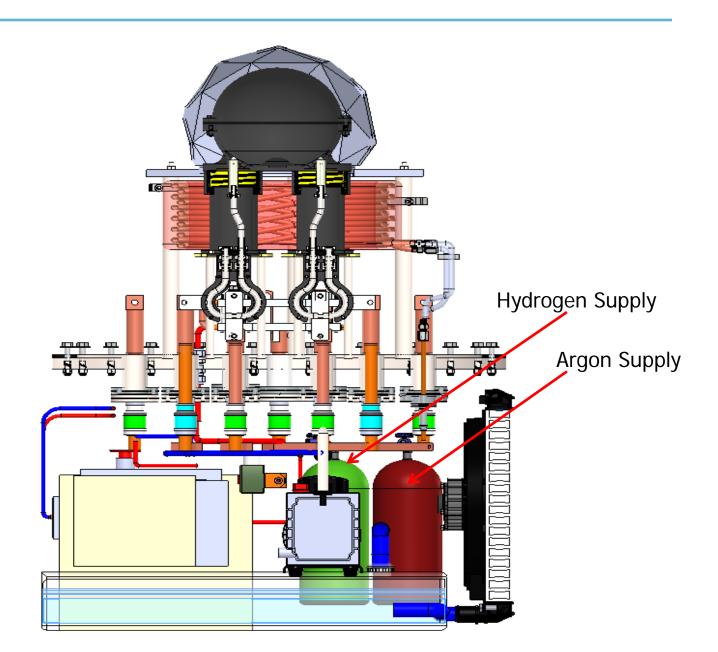




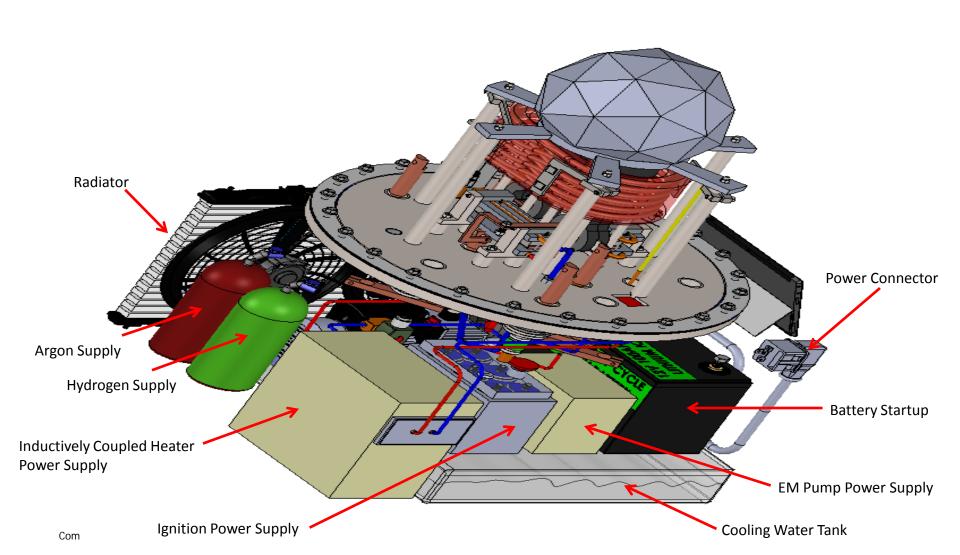


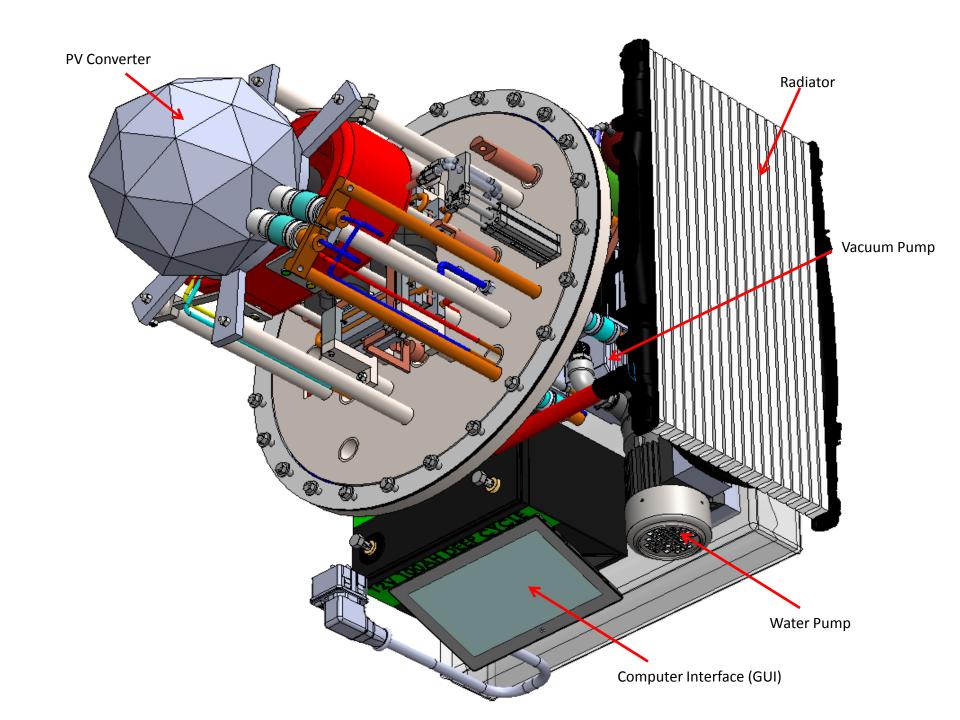




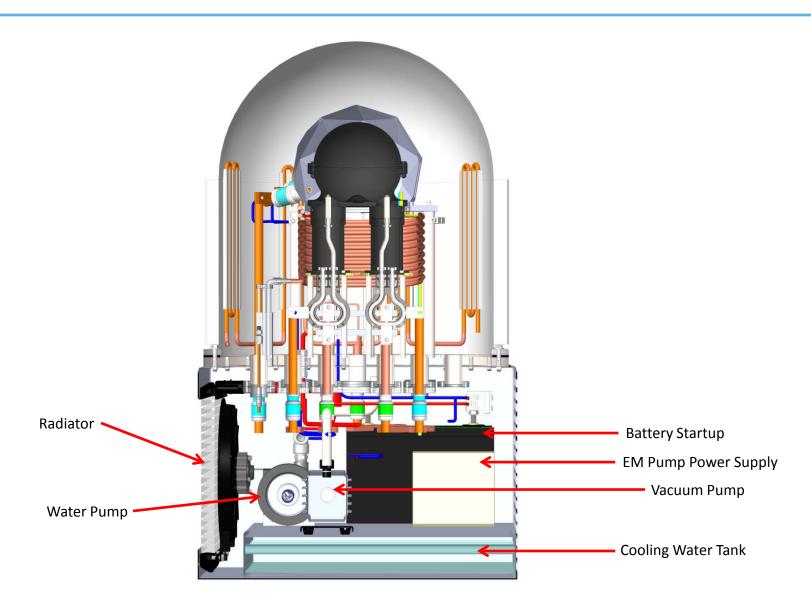




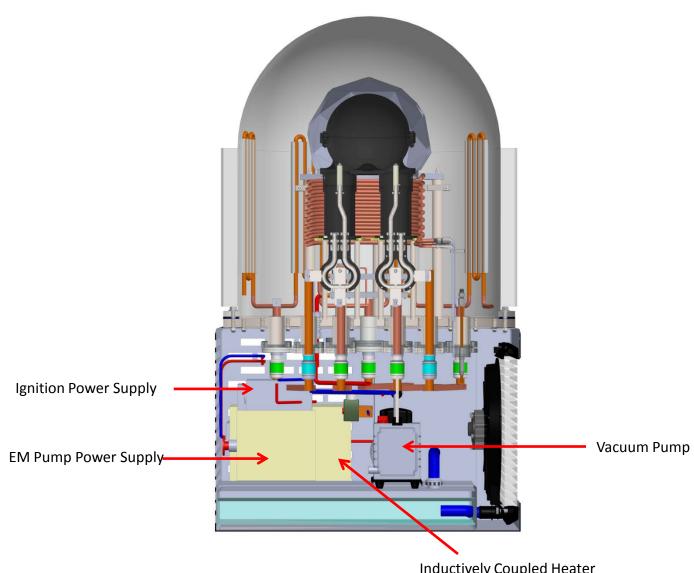






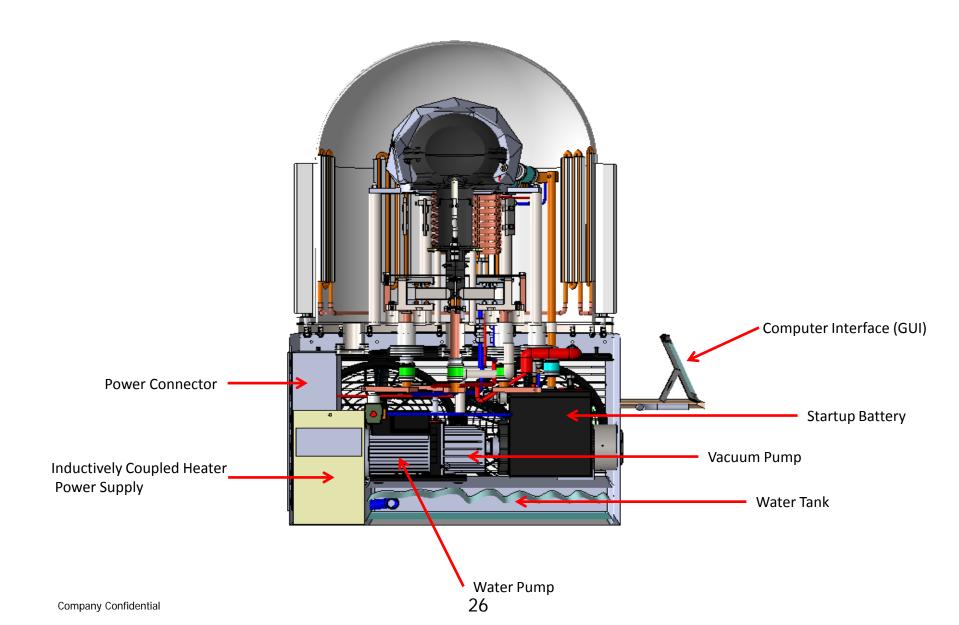




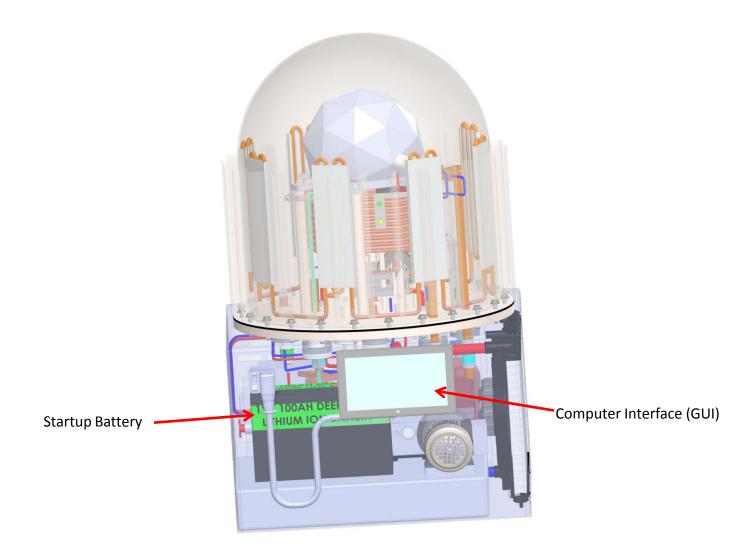


Inductively Coupled Heater Power Supply

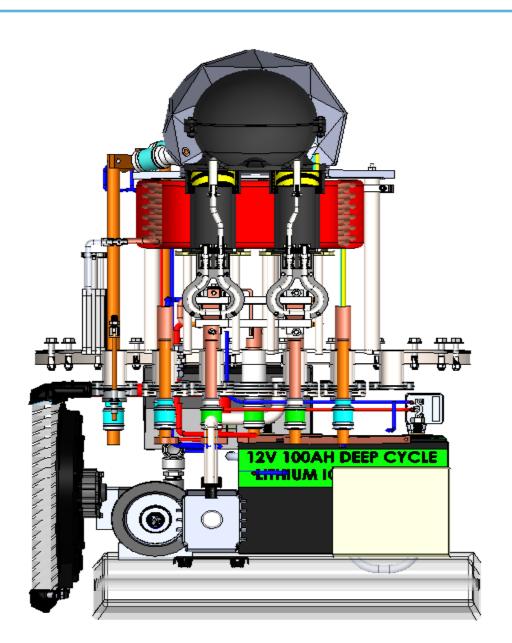




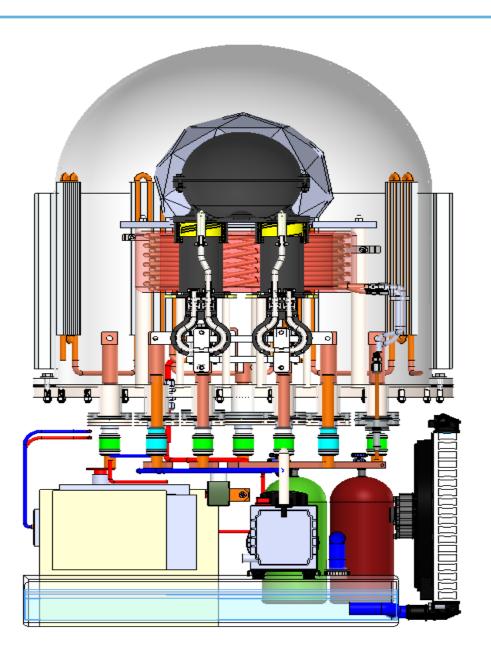




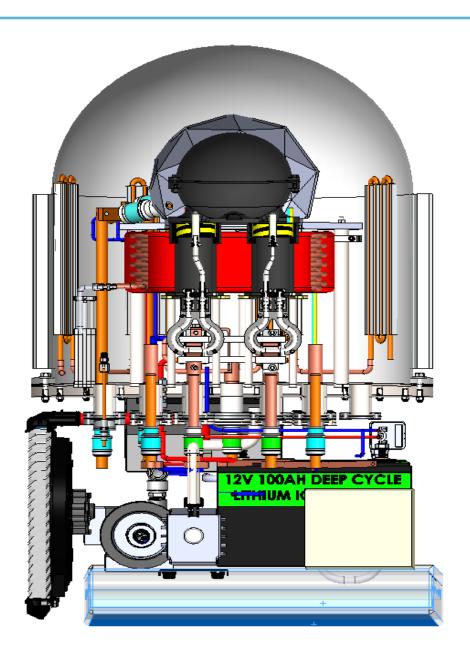




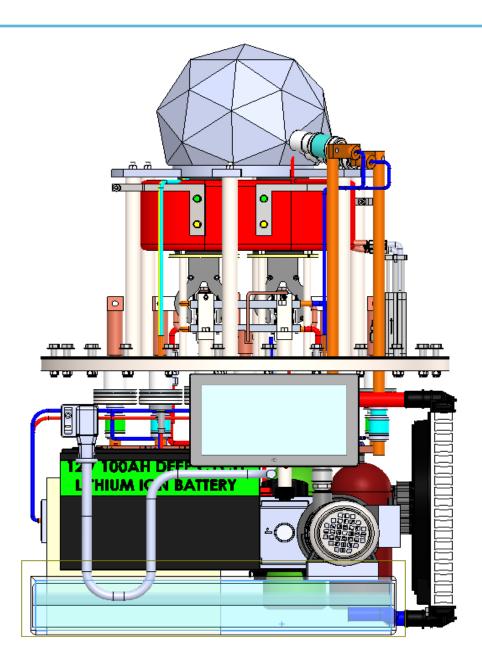




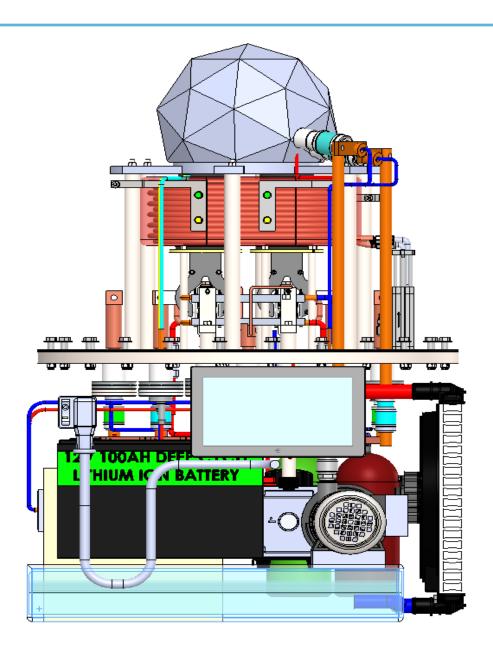




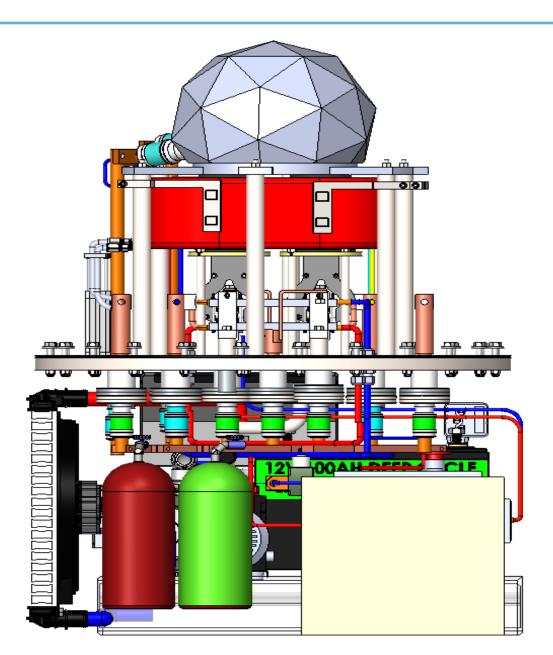




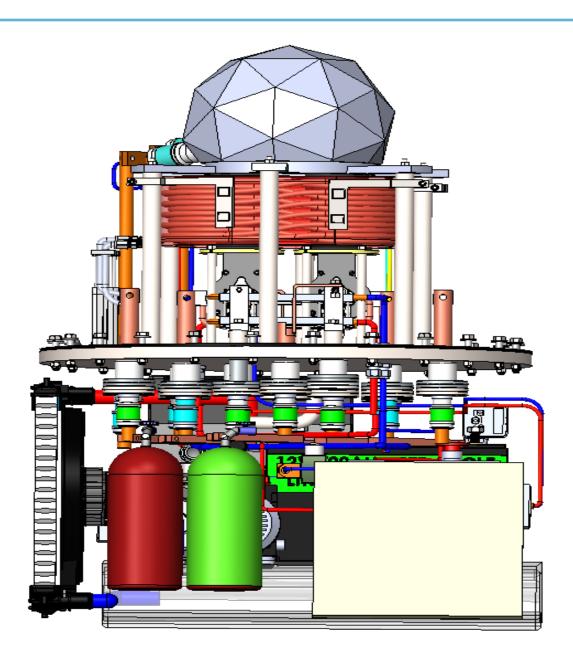




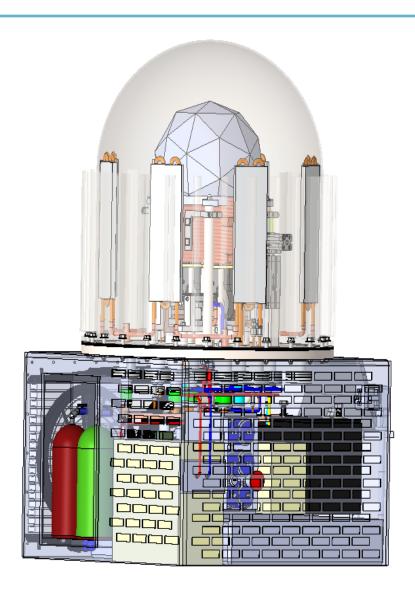






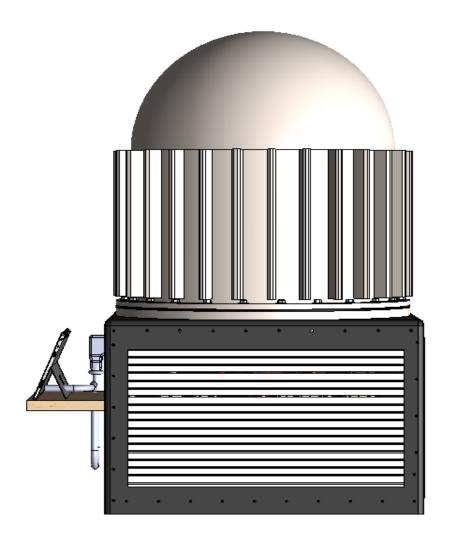






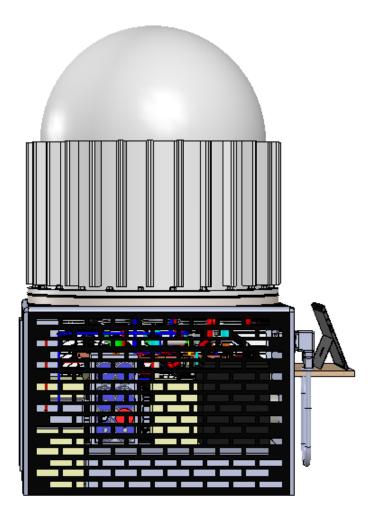






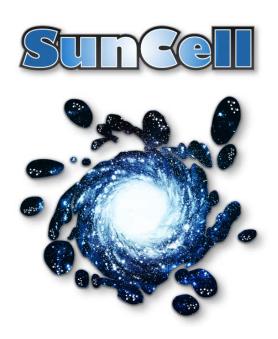








## SunCell Commercial Prototype

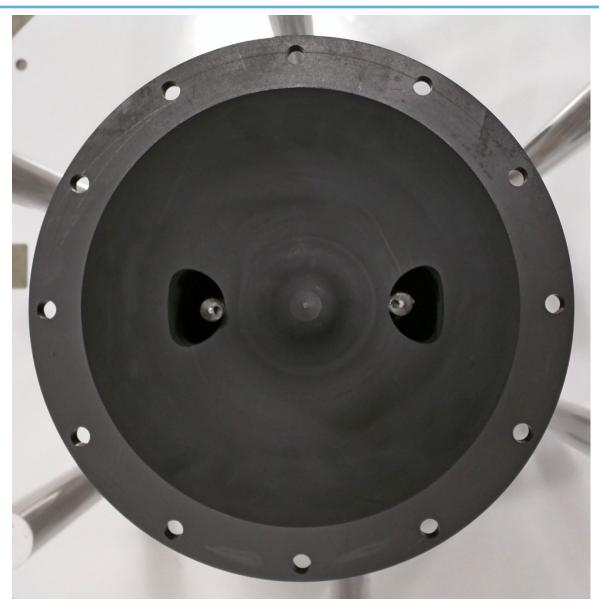


# Commercial SunCell Design



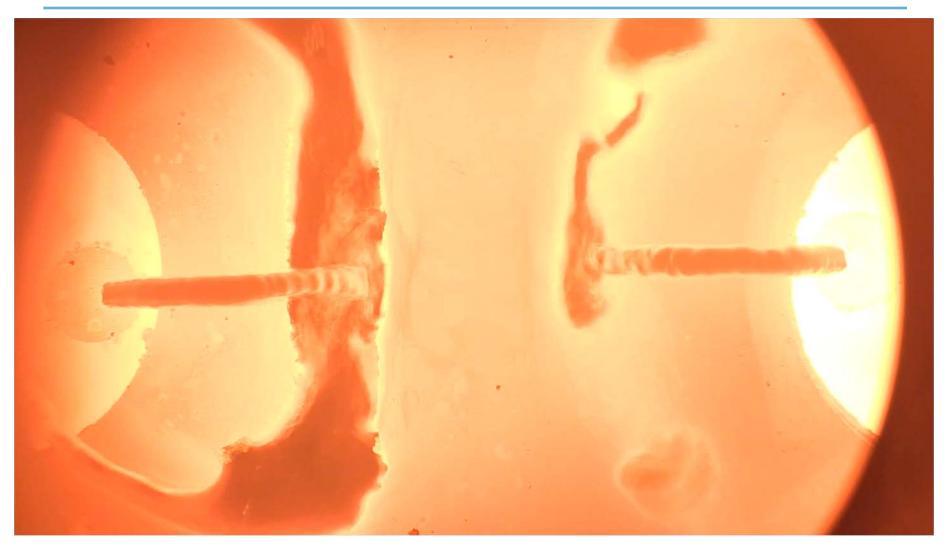






### Commercial SunCell Test





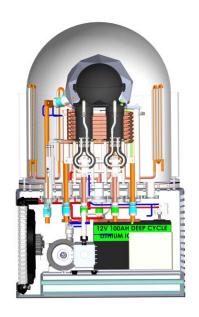
Click the above image to view the video on YouTube: <a href="https://www.youtube.com/watch?v=jUBheBH9eio">https://www.youtube.com/watch?v=jUBheBH9eio</a>





Development	Party	Timing
Closed system & sustained light source performance	BrLP	Q2 16
Production SunCell Design	Engr. Firm	Q2-Q4 16
CPV modified cell design & fabricate	Supplier	Q2-Q4 16
CPV integration to SunCell light source (blackbody)	Engr. Firm	Q4 16
Initial SunCell Test Units	Engr. Firm	1H 17
Manufacturing & Repair Readiness	Mfg Firm	1H 17
SunCell Production Field Deliveries	Mfg Firm	2H 17





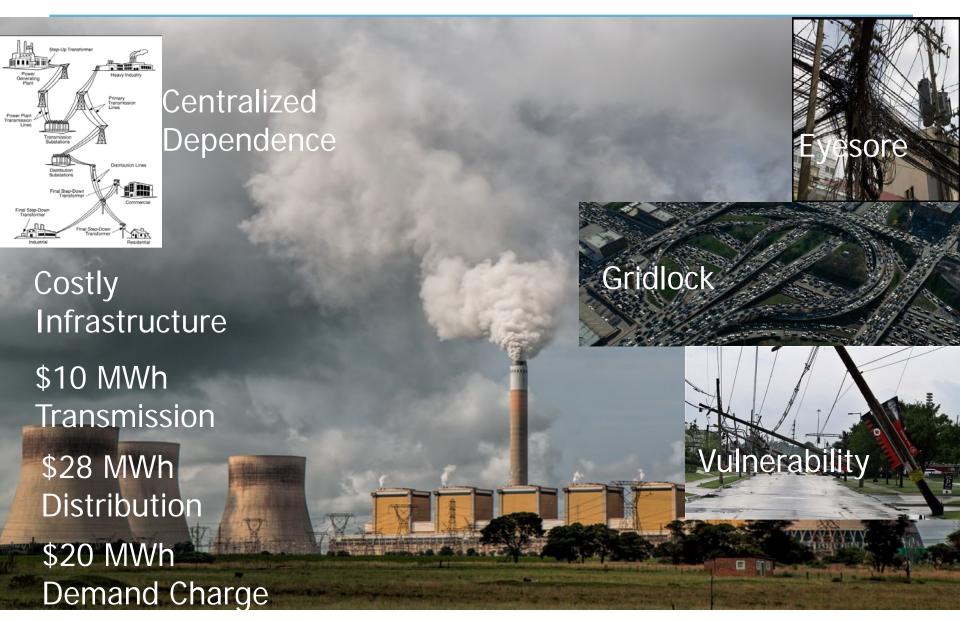


### Centralized Electrical Power ... Since 1882





### **Central Generation Transmission**





#### Global Established Accessible Market with Expansion Opportunities

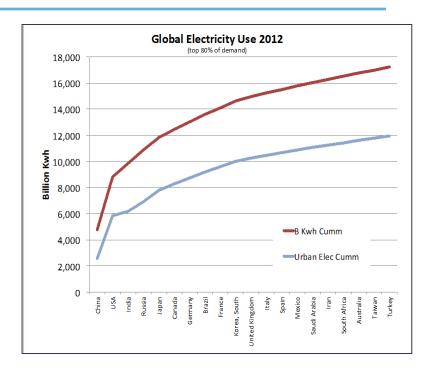
- Reinvent electrification as autonomous, completely off grid, mass produced personal power.
- Flat per diem lease charge with no metering.
- Using cell redundancy being off grid is much cheaper than any grid connection and avoids all related utility regulatory leverage.
- Behind the meter during a short temporary learn out phase in the United States, then global push.





#### Global Established Accessible Market with Expansion Opportunities

- 69% of global electrical use in urban areas; power consumption mirrors country developmental status
- In the US, the cheapest grid distribution being the local urban grid connection fees of \$0.01-0.02 / kWh are at least ten times the cost of redundant off-grid SunCells
- Off grid deployment avoids transmission, distribution, and demand fees and regulations
- Redundant SunCells satisfies peak demand and service interruption due to breakdown
- Model can be proliferated worldwide urban to rural immediately; no grid or fuels infrastructure required; developed to developing countries (necessity and pollution abatement are also drivers)

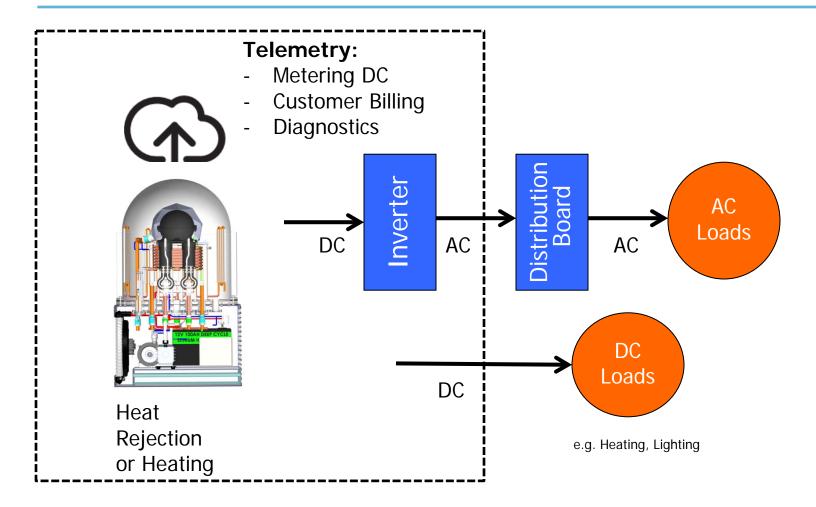




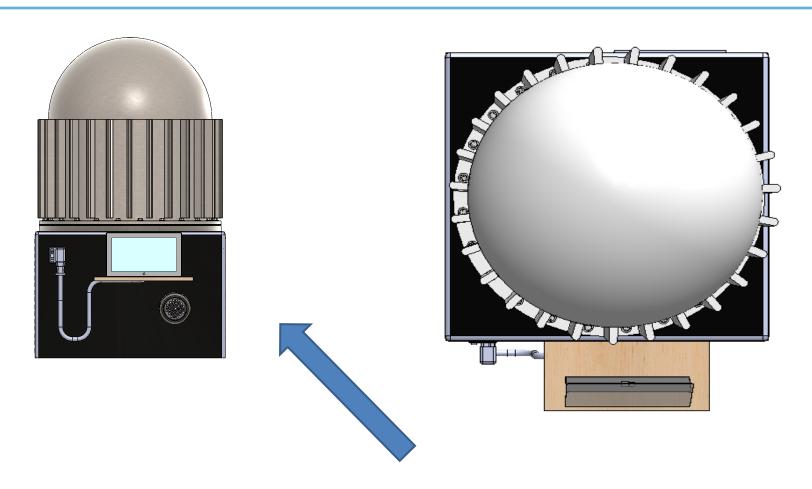
Chicago at Night



# SunCell Turnkey System (Basic)



# 250KW SUNCELL SURFACE AREA & brilliant



SURFACE AREA =  $27" \times 27" = 729 \text{ SQ.IN}$ 





Feature	Est.
Power Output	10 kW, 100 kW, 250 kW DC or AC
DC Voltage	~380 or ~760
AC Inverter for 50/60 Hz	Option
SunCell dimensions (L,W, H)	0.5x0.5x0.5m
Photovoltaic Power Density	2000 Suns
Blackbody Radiator Power Density	10 MW/m2
Weight	100 kg
Warm-up Time	<1 min
Self-consumption power	<3 kW
Response Time (standby to peak)	~100ms
Service Life	15 years
Noise Emission	Sound Proofed
Degree of protection (per IEC 60529)	
Climatic category (per IEC 60721-3-4)	

# Stationary Market Launch



## **Highest Power Density to Lowest**

**Industrial and Commercial** 

Multitenant Residential

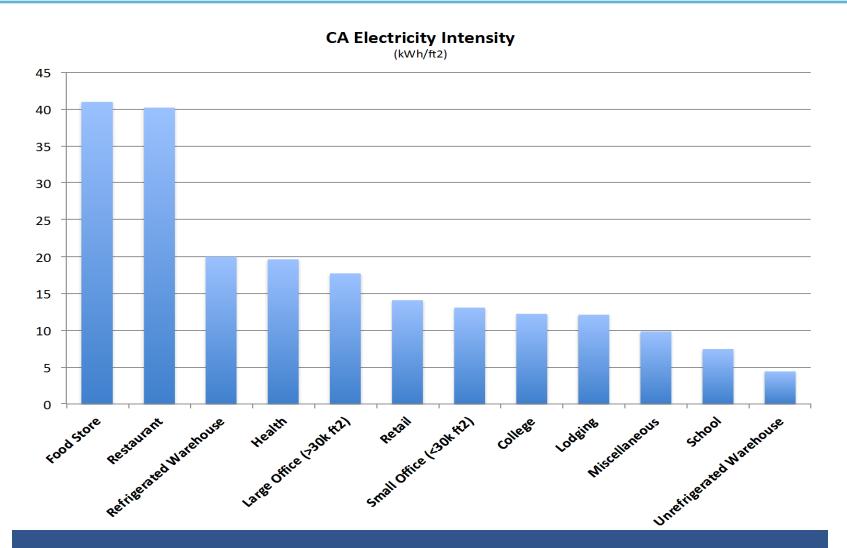
**Small Business** 

**Rural Residential** 

Developing Countries



### **Commercial Customers**



Several Attractive Segments for Initial SunCell Deployment



### Stationary Market Launch cont'd

- Baseload
- Initially SunCells behind the meter, retain grid connection; switch to off grid following learn out and reliability demonstration

#### SunCells:

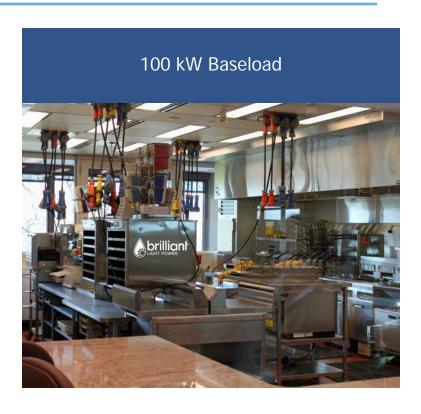
#### **Initial Power:**

Gen 1: 10 kW

Gen 2: 100-250 kW

#### Heating:

 Since 34% of the global energy demand is buildings, for mostly heating <100 °C, rejected heat may be sold as well.





#### Quick Serve Restaurants (QSR) Power Lease Agreement Benefits

#### Quick Service Restaurant

- Electricity is high cost driver; annually 30-50 kWh / sft
- \$0.12 to \$0.20 per kWh
- BrLP SunCell 50% savings
- Lease at \$0.05 per kWh (DC)
- Upfront install fee with payback <90 days</li>
- MOU to purchase at least 10MWh of continuous power (individual units with nameplate capacity of 100-200kW)
- Proceed only when satisfied with product and reliability

#### Brilliant Light Power

- BrLP manages technology and partners, end users very limited risk
- QSR customer base is ideally suited for initial products of 100-200kW power
- Repetitive installations
- End user feedback during upcoming design phase

OSR Gains Clean, Cheap Energy; BrLP Gains Scalable Customer Base

## Stationary Market Launch cont'd



% Global Electricity	51%	12%	18%
		AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	
	00000		
	Industrial	Commercial	Residential

- DER (Distributed Energy Resource)
  - Multi SunCells off grid
  - No metering, only per diem lease fee based on capacity to suit historic and anticipated maximum load at peak
  - Ganged/Networked SunCell DERs within a large building, complex of buildings, or industrial or commercial site; interconnected by low voltage private grid.
  - Provide capacity, demand response
  - Redundancy, avoid disruption
  - Flexible ramping, smart controls to smooth peaking

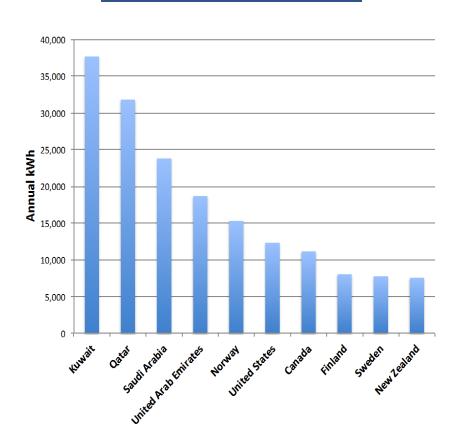
#### SunCells:

- Core Power:
  - Paralleled systems: 250kW-2MW



#### Residential Markets

#### Global Household Electricity



#### **US Household Electricity**

- Product: 10kW SunCell
- 128M US residential households
- Average electricity use
  - 12,300 kWh / year
  - 12.5 cents per kWh
  - \$1,369 / year
- US residential market \$176B
- Segmentation:
  - Top 1% use 4X average
  - Top 10% use 2X average
  - Florida 40% above national avg.
  - Texas 26% above national avg.

3M+ High End US Customers for Initial Residential SunCell

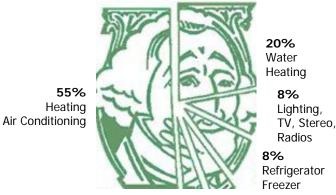


#### Current Smart Appliance Controls Can Smooth Peaking

- Lighting
- Thermostat
- Smoke Detector
- Video Monitors
- Garage Doors
- Air Conditioning
- Locks
- Washer and Dryer

Heating, Air Conditioning & Water Heating is 75% of home demand





**4%** Clothes Dryer

**5%** Food Preparation

Dryer Dish Washer



#### Wireless Communications Disruption as Off-Grid Model for SunCell

#### Landlines



#### Mobile



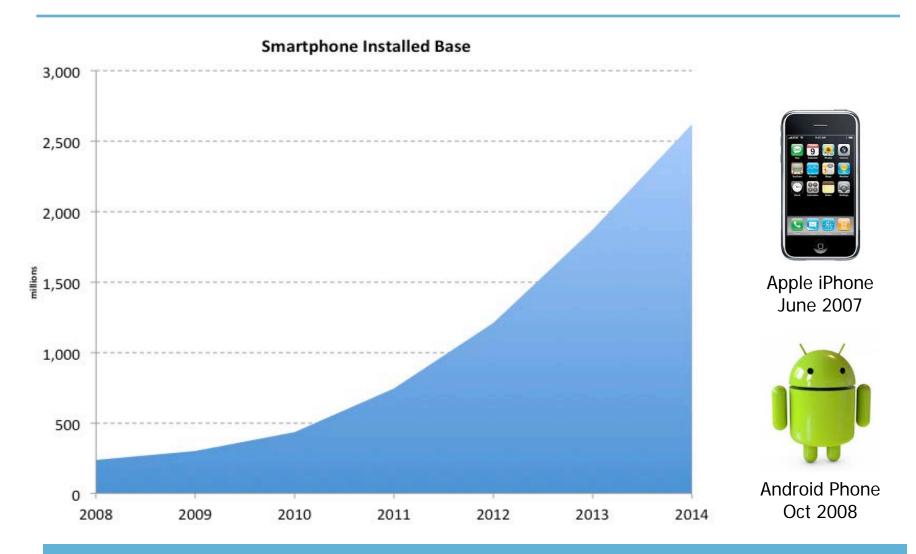


1877	First commercial telephone service	1979	First cellular service
2006	Peaks at 1.3B users, 19% of population	2002	Mobile > Landlines
2014	Users drop to 1.0B	2014	5.2B Unique users, 73% of population

By 2002, mobile surpassed 125 year old Landline industry. By 2014, mobile is \$1.1T business and 5X Landline users.



#### Wireless Smartphone Phone Growth as Off-Grid Model for SunCell



In just 6 years, installed base grows to 2.6B with 49% CAGR

### Stationary Lease Economics

#### **Stationary Examples**

			Upfront			
SunCell Rated Net	50% Capacity	Sample kWh	Payment Range	Upfront	Daily Lease	SunCell Annual
Capacity DC (kW)	kW	Rate	\$50-100/kW	Payment	Rate	Lease Rate
10	5	\$0.05	\$100.00	\$1,000	\$6.00	\$2,190
150	75	\$0.05	\$75.00	\$11,250	\$90.00	\$32,850
250	125	\$0.05	\$50.00	\$12,500	\$150.00	\$54,750

		100% Use of SunCell		Min 50% U	se of SunCell
				Customer	
SunCell Rated Net		Customer	Upfront Fee	Annual	Upfront Fee
Capacity DC (kW)	Grid kWh Rate	Annual Savings	Payback (Days)	Savings	Payback (Days)
10	\$0.11	\$5,256	69	\$2,628	139
150	\$0.11	\$78,840	52	\$39,420	104
250	\$0.11	\$131,400	35	\$65,700	69

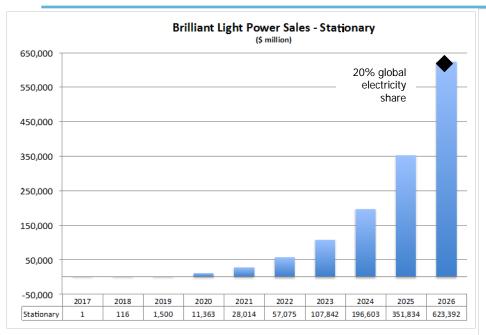
SunCell Rated Net	Optional AC	Daily Lease	Inverter Annual
Capacity DC (kW)	Inverter Rate	Rate	Lease Rate
10	\$0.01	\$2.40	\$876
150	\$0.01	\$36.00	\$13,140
250	\$0.01	\$60.00	\$21,900

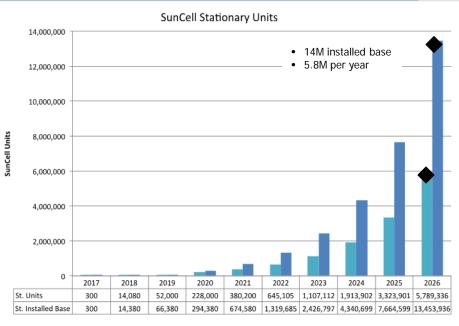
#### SunCell ~150kW

- Customer payback in <4 months!</p>
- <50% of Electrical Grid Rate
- BrLP \$39K / year in revenue



### Stationary Financials





- Phase 1 SunCell ~10kW
  - Launch 2H 2017
  - Target market high use residential, commercial, data center, food service
  - Global placements in Canada, Mexico, US, Caribbean, etc.
  - Install Fee = cost of SunCell + \$3,500 (initial test units).
  - Customer upfront fee payback <100 days</li>
  - Lease rate corresponding to \$0.05 per kWh
  - SunCell 50% utilization

- Phase 2 SunCell ~150kW
  - Launch 2H 2018
  - Target market large large commercial buildings plus mobile development
  - Global rollout
  - Install Fee = cost of SunCell + \$3,500.
  - Customer upfront fee payback <60 days</li>
  - Lease rate corresponding to \$0.05 per kWh
  - SunCell 50% Utilization

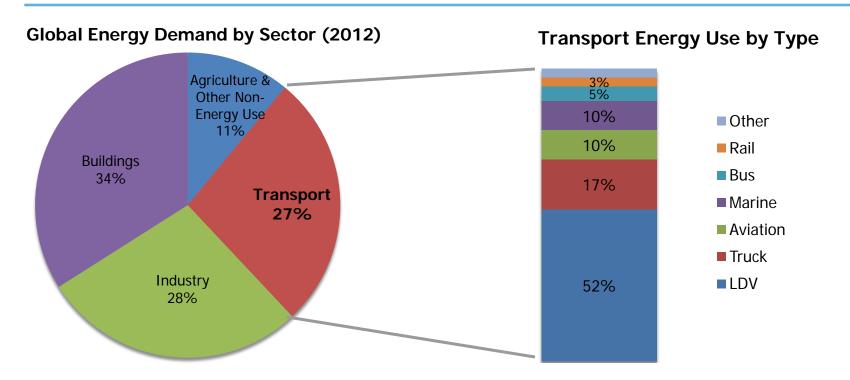


## The World Currently Runs on Oil





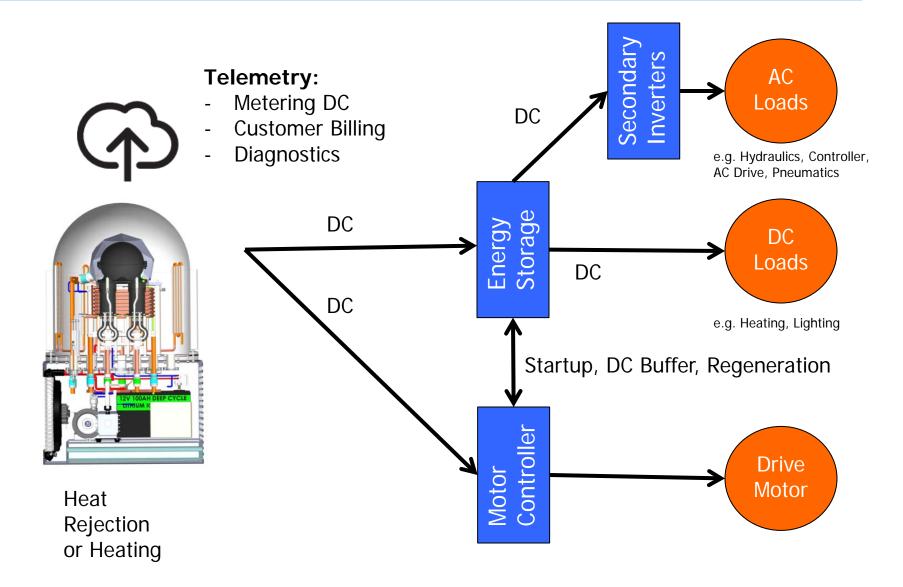
### Global Motive Energy Use



- Transportation consumes ~2,200 million tonnes of oil equivalent (Mtoe) of energy each year or 25,586 Terawatt hours.
- 700M+ Passenger Car population drives energy use, but hours of operation relatively low (~5% of time)







#### **Motive Markets**





- 3.4M medium & heavy duty trucks per year
- 0.3M buses per year
- Average of 200kW power, utilized 30-70% of time
- 3,500 terawatt hour electricity potential (add per year)
- > EU existing electricity generation



- 86M automobile & light duty Trucks per year
- Average of 100kW power, only used on road 5% of time
- SunCell generate power other 95%
- 46,000 terawatt hour electricity potential (added per year)
- 2X existing global electricity generation

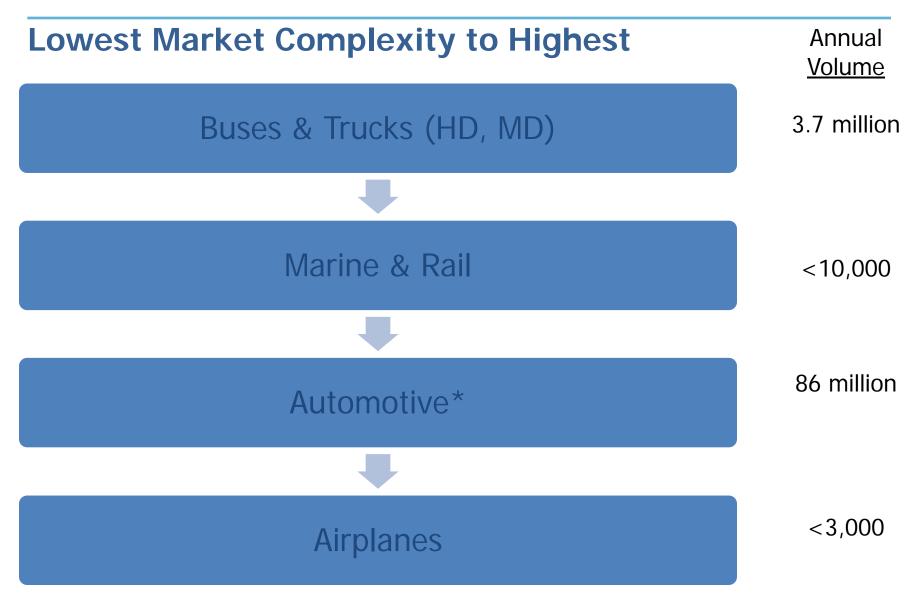


- Trains and ships comprise mobile electric power plants and have a substantial electric hotel load
- Unique requirements for aviation, unmanned aerial vehicles (UAV) and business jets may be entry points, early electric jets have been demonstrated as the industry moves towards electrification

Source: ATKearney – Global Truck Study – Perspectives towards 2030 International Organization of Motor Vehicle Manufacturers 2016

### Motive Market Launch



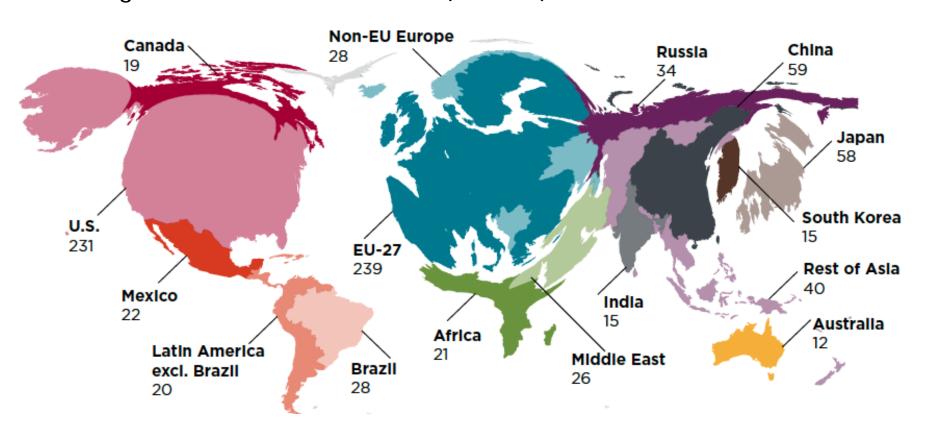


<sup>\*</sup> Automotive includes Light Duty Vehicles (LDV)
Company Confidential



### Vehicle Population Provides Profound Opportunity

Passenger Car Vehicle Stock 2013 (millions)

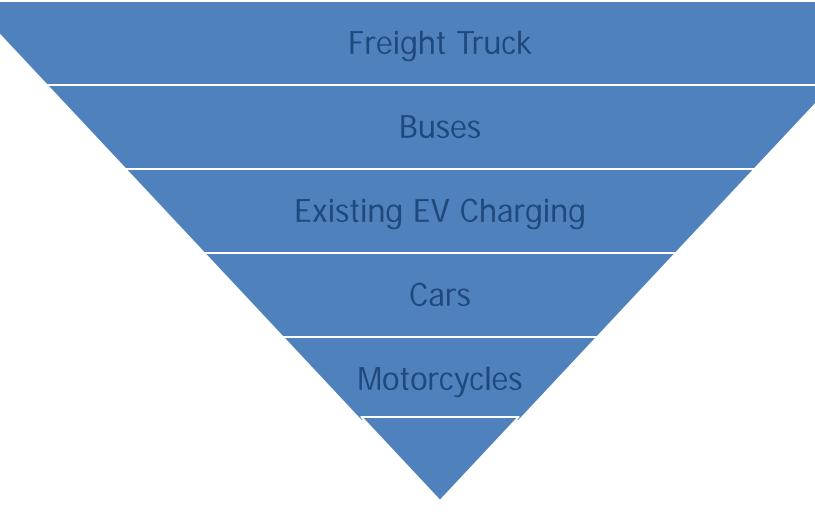


2015 Production: 68M Passenger Cars and 18M Light Duty Trucks

### Motive Vehicle Market Launch

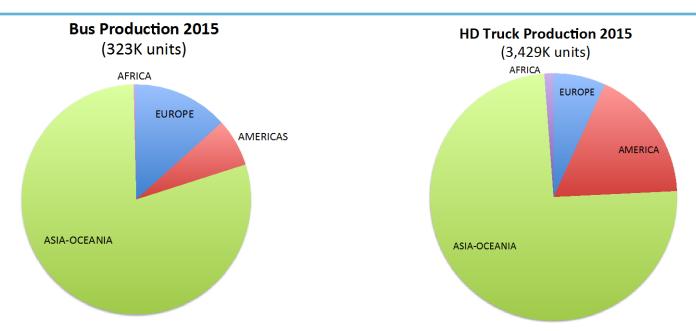


## **Highest Power and Energy Usage to Lowest**





### Trucks & Buses Have High Power Utilization



- 3.8 million units per year
- 22% of global transportation energy use with 4% of annual volume
- #1 cost driver is fuel; 39-71% of total operating cost
- High utilization rates
  - Buses: 12-20 hours of operation per day
  - Trucks: 8-14 hours of operation per day
  - Autonomous driver technology has potential to drive up utilization

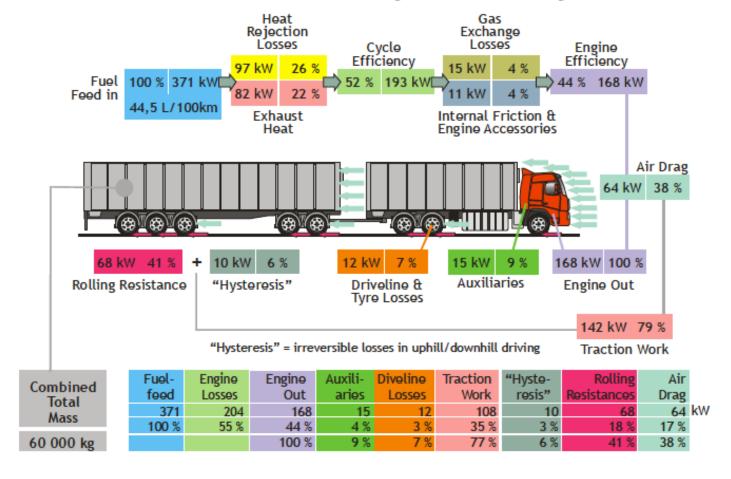
68



#### HD Truck Peak Power Varies 2.5X from Cruise

Volvo FH12: Engine 450kW peak, cruise 168kW or 37% of peak power

#### 60 ton Tractor & Trailer, Full Payload, Freeway at 80 km/h





### Buses & Trucks Attractive Due to High Use cont'd

**HD Truck Examples (Replace Diesel Engine & After treatment)** 

Vehicle Type	Engine Size Today	SunCell Rated Net Capacity DC (kW)	Rate per mile/kW	Upfront Payment Range \$50- 100/kW
Bus	212	250	\$0.0015	\$50.00
MD Truck	209	250	\$0.0015	\$50.00
HD Truck	350	350	\$0.0015	\$50.00

		Upfront Costs			
	SunCell Rated			Upfront	
	Net Capacity DC	Diesel Engine	After treatment	Payment	SunCell Upfront
Vehicle Type	(kW)	Cost	Cost	(100% share)	Savings
Bus	250	\$12,500	\$4,955	\$12,500	\$4,955
MD Truck	250	\$12,500	\$4,955	\$12,500	\$4,955
HD Truck	350	\$17,500	\$6,937	\$17,500	\$6,937

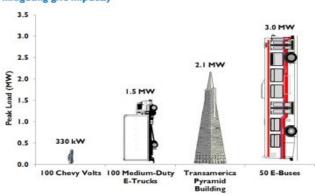
	Annual Fuel Cost					
Vehicle Type	Miles Per Year	MPG	Fuel Cost	Fuel Cost / Year	SunCell Cost / Year	Customer SunCell Fuel Savings /yr
Bus	46,600	3.30	\$3.82	\$53,943	\$17,475	\$36,468
MD Truck	24,850	3.20	\$3.82	\$29,665	\$9,319	\$20,346
HD Truck	109,226	6.55	\$3.82	\$63,701	\$57,344	\$6,358

- Customer get immediate cost savings and clean energy!
- BrLP, no capital required at mature volume
- BrLP annual leases from \$9K to 57K per unit



### Motive EV Charging: Bus and Truck Market Launch

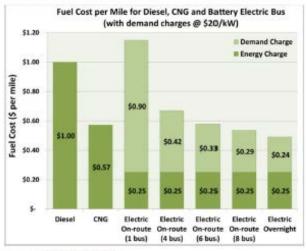
Figure 14: Peak loads for various electric vehicle fleets (without mitigating grid impacts)



Assumptions: the Chew Volt charging rate is 3.3 kW, the medium-duty E-Truck charging rate is 15 kW and the E-Bus charging rate is 60 kW. The peak load for the Transamerica Pyramid building is from [26].

- Municipalities are rapidly adopting electric buses
- Freight trucks are also being electrified
- SunCell charger eliminates demand charge, transmission charge, utility regulations and bureaucracy, electrical infrastructure build out
- Charge per kWh with savings of about half the current cost of electric battery charging
- Batteries are more expensive than a SunCell of the same power, but a charging station can be run continuously so the SunCell economics based on utilization are better

Figure 11: Impact of peak demand charges on E-Buses



Source: CALSTART [19]

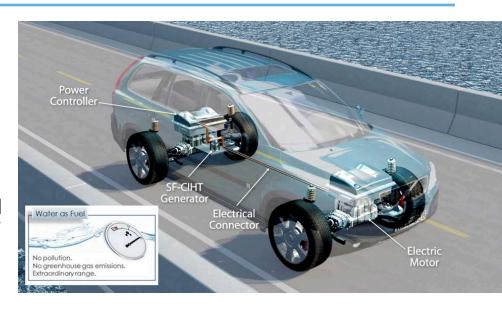
#### Assumptions:

Each bus drives 40,000 miles per year. The diesel bus has a fuel economy of 4 MPG and diesel is priced at \$4.00 per gallon. The CNG bus has a fuel economy of 3.5 MPDGE and CNG is priced at \$2.00 per DGE. The electric transit buses have an efficiency of 2.5 AC kWh/mile and electricity is priced at \$0.10kWh. One electric bus charging on-route draws 150 kW from the grid, 4 draw 280 kW, 6 draw 330 kW and 8 draw 380 kW. The electric bus charging overnight draws 40 kW from the grid.

#### Motive Car Market Launch



- Over 1000 miles per liter of water.\*
- Projected cost of \$50-\$100 per kW electric.
- One third the weight of an internal combustion engine (ICE).
- Projected 200 kW (267 HP) SunCell and electric drive system is less than that of a comparable combustion system.
- Has the potential of unsurpassed capability in terms of range, capital cost, power, logistics, and pollution abatement to zero including zero carbon dioxide emission.



\*Calculations:  $H_2O$  to  $H_2(1/4) + 1/2O_2$  (50MJ/mole or 2.78 GJ/kg, 2.78 GJ/liter)

Model S energy consumption rate of 291 Wh/mile (<a href="http://www.teslamotors.com/goelectric#savings">http://www.teslamotors.com/goelectric#savings</a>)

1 Whr = 3600 J

Model S energy consumption rate of 1 MJ/mile

2780 MJ/liter /(1 MJ/mile) X 0.4 (PV efficiency) = 1112 miles/liter



## Converting Passenger Cars to Generators

#### Top selling models by region

Region	Model	Engine (kW)	SunCell Lease*	Customer Revenue Potential*
USA / Canada	Ford F150	275	-\$5,500	\$9,636
Australia	Toyota Corolla	103	-\$2,060	\$3,609
Europe	VW Golf	81	-\$1,620	\$2,838
Mexico	Chevrolet Aveo	77	-\$1,540	\$2,698
China	Wuling Hong Guang	63	-\$1,260	\$2,208
Brazil	VW Gol	56	-\$1,120	\$1,962
Japan	Toyota Aqua	54	-\$1,080	\$1,892
India	Maruti Alto 800	35	-\$700	\$1,226

<sup>\*</sup> Lease –\$0.002 per mile/kW; minimum charge of 10,000 miles per year.

<sup>\*</sup> Customer uses SunCell 20% of time as generator at \$0.05 per kWh; the revenue is split with the lessee (60% BrLP/40% lessee)



## Motive EV Charging: Car Market Launch

- EV's can replace internal combustion engine cars, but convenient high power electricity is needed
- The cost of the required massive power plant and grid build out that would be in the trillions (doubling of the current infrastructure) is avoided by deploying autonomous distributed SunCell charging stations
- Batteries are more expensive than a SunCell of the same power, but a charging station can be run continuously such that the SunCell economics based on high utilization are better
- Charge \$0.05 per kWh with savings of about half the current cost of electric battery charging





## Motive to Stationary









75



- US installed electric power capacity: 1 TW, 3 kW/person
   1 kW residential, commercial, industrial, respectively, CF = 50%
- Registered road vehicles: 260 million (180 M cars @100 kW, 2.5 M heavy trucks @500 kW, 77.5 M light trucks @250 kW)
   = 120 kW/person
- Non-road availability of cars: 23 h/day = 95% Peak load use of SunCell vehicle generators: 3/120 = 2.5%; off-peak 1/120 = 0.85%, average 1.5%.
- Once 2% of cars are SunCell equipped (4 months of car production), present electric power demand would be fully met by SunCell cars. We need to find new uses for the other 98% capacity of SunCell cars

- 100kW engine average power
- 5% of time for transportation
- SunCell becomes generator other 95%, revenue is spilt with the lessee (60% BrLP/40% lessee)
- New applications of the inexpensive, clean massive motive to stationary power are anticipated: water treatment, desalination, continuous hydroponic farming, fish farming, production of commodities and materials such as hydrogen, aluminum, steel, paper, and glass, land reclamation, super power intensive mass transit such as the Hyperloop and high speed rail (maglev) and defense applications such as energy-directed missile defense (e.g. free electron and other lasers and railguns)
- Sea floor and ocean mining (seawater contains about 2-100 ppt of silver and about 0.1 to 2 mg / ton of gold)



## Passenger Car Leverages Motive to Stationary

Automotive Examples			Upfront Costs				
		SCall Data		Upfront		Upfront	CCall
	Engine Size	SunCell Rated Net Capacity DC	Pata par	Payment Range \$50-	Gas Engine Cost	Payment (ICE cost @	SunCell Upfront
Vehicle Type	Today	(kW)	Rate per mile/kW	100/kW	Estimate	SunCell Power)	Savings
	·						
Ford F150	275	250	\$0.0020	\$50.00	\$2,597	\$2,361	\$236
Hyundai Elantra	129	150	\$0.0020	\$50.00	\$1,218	\$1,417	-\$198
Toyota Corolla	103	100	\$0.0020	\$50.00	\$973	\$944	\$28

	Annual Fuel Cost						
Vehicle Type	Miles Per Year	MPG (EPA combined)	Fuel Cost (Gas 2014)	Fuel Cost / Year	SunCell Cost / Year	Customer SunCell Added Cost /yr	
Ford F150	14,500	20.00	\$3.34	\$2,422	\$7,250	-\$4,829	
Hyundai Elantra	14,500	31.00	\$3.34	\$1,562	\$4,350	-\$2,788	
Toyota Corolla	10,000	29.00	\$3.34	\$1,152	\$2,000	-\$848	

	Stat	ionary Power Re	Summary		
	Stationary				
	Power Resale				
	(20% of day @	BrLP Revenue	Customer	BrLP Revenue	Customer Net
Vehicle Type	\$0.05per kWh)	(60%)	Rebate (40%)	/ Year	Savings / Year
Ford F150	21,900	13,140	8,760	\$20,390	\$8,312
Hyundai Elantra	13,140	7,884	5,256	\$12,234	\$5,096
Toyota Corolla	8,760	5,256	3,504	\$7,256	\$4,408

- Customer uses car to generate income when stationary
- **OEM** neutral on cost versus ICE
- BrLP annual revenue of \$10K to 20K per unit

## Transport Refrigeration Market

Road (Large Trucks & Trailers)	4,000K	200K	5-20kW
Intermodal (ocean)	950K	100K	4-12kW
Railcars	20K	Low	10-30kW



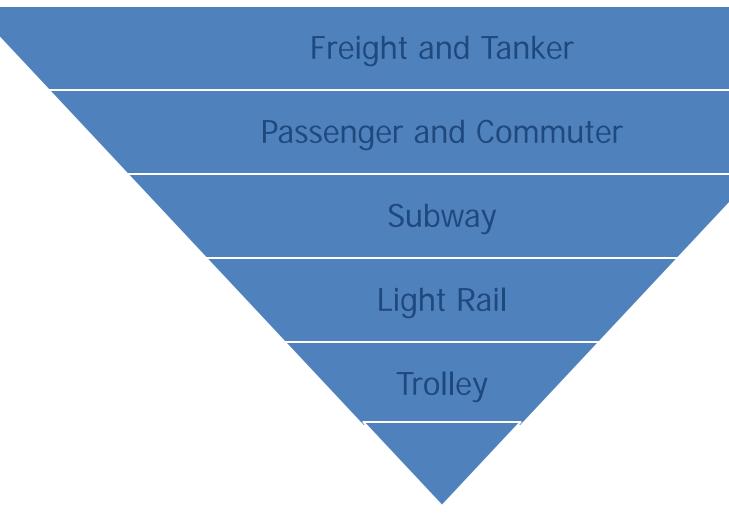


- Applications typically powered by Truck or Ship engine today.
- Some installations have standby generators
- Early market opportunity to provide 10kW SunCell in lieu of engine or generators

## Motive Rail Market Launch



# **Highest Power and Energy Usage to Lowest**



#### Motive Rail Market Launch cont'd



- Railways transported over 8% of the world's passengers and goods.
- The rail sector used close to 611 TWh of energy in 2012, mostly provided by oil products and electricity.
- Electrification accounts for nearly one third of total tracks globally in 2012.
- SunCell enables 100% conversion to electric system without high infrastructure conversion cost
- \$0.05 per kWh charge with savings of over \$0.05 per kWh on just the energy use







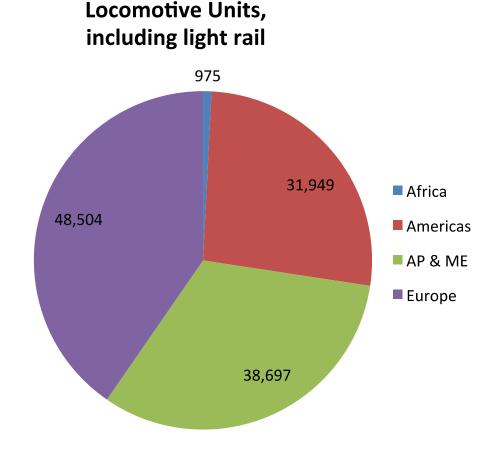








- 120,125 units worldwide
- Average age 27 years
- Annual orders of 5,000-7,000 units
- 611 TWh of energy in 2012

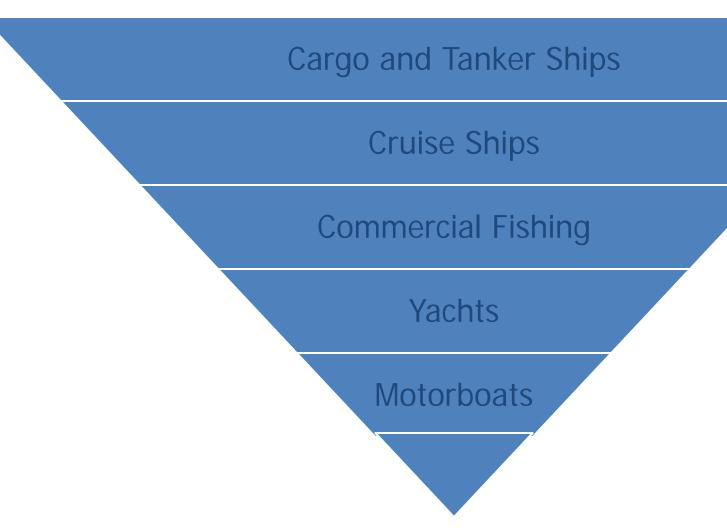


\$31B market potential, with comparable savings for operators

#### Motive Marine Market Launch



# **Highest Power and Energy Usage to Lowest**



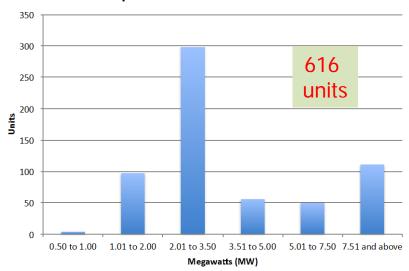
#### Marine Power Market







#### **Propulsion Generator Sets 2014**

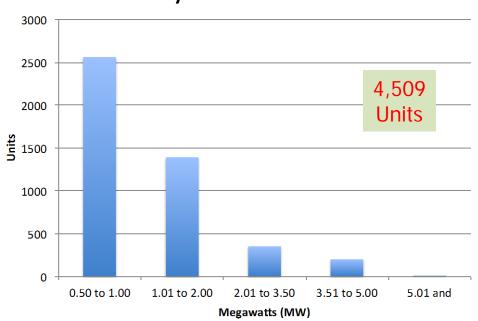


- 1 MW SunCell is planned for the heavy marine market
- Majority of the market is in the range of 2 to 3 MW.
- Electric propulsion is becoming mainstream
- Ships are floating power plants
- Electric hotel loads of about 100 kW scale can serve as an entry point
- Charge per nautical mile and per kWH for hotel load with savings of about half the current cost
- Market share: Wärtsilä 59%, MAN 16%, Caterpillar 7%

#### Marine Auxiliary Generator Market Served by Paralleling SunCells



#### **Auxiliary Generator Sets 2014**

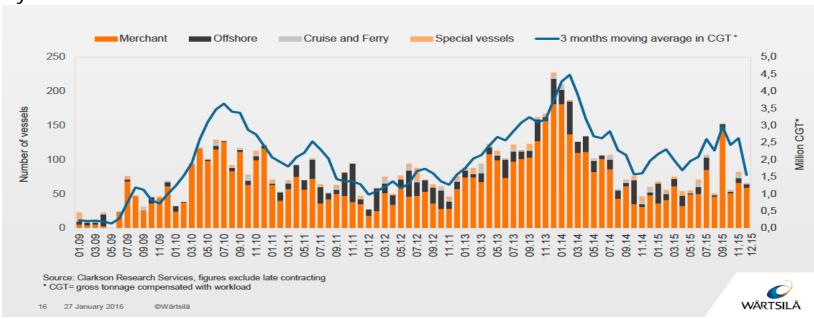


- 500 kW to 2 MW corresponding to 2 to less than 10 ganged 250 kW SunCells services the majority of the market
- Auxiliary Generator Set is fragmented: Wärtsilä's 12%, many other including MAN, HiMSEN (Hyundai Heavy Industries), etc.



## Marine Market Power Requirements

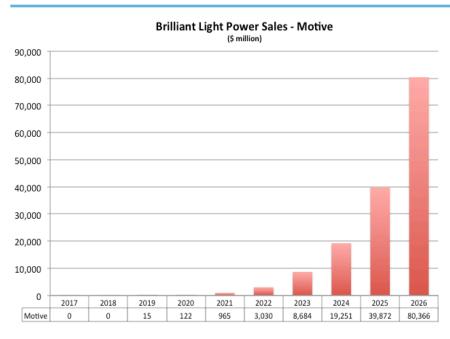
#### **Cyclical Vessel Contracts**

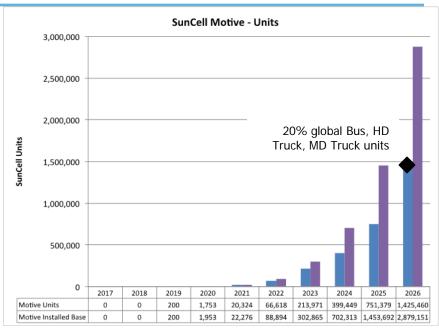


2014 & 2015 Averaged	Ship MW / year	SunCell \$/kWh	Engine Hours / Year	Avg Power Used	\$B / year
Medium Speed					
Engines	3,865	\$0.05	4,000	50%	\$0.39
Auxiliary Engines	5,675	\$0.05	4,000	50%	\$0.57

#### Marine power demand estimated at \$24B per year

# Motive Financials (Bus, Truck, Car, Rail, Marine)





#### Bus & MD/HD Trucks

- Launch 2019 with 250kW & 350kW SunCells
- Leverage 250kW Stationary design
- Target high utilization customers
- Upfront fee near cost of diesel engine
- Customer has immediate payback
- Lease rate of \$0.002 per mile /kW, over 10K miles per year then rate of \$0.0015
- Upside as Generators with 60% BrLP/40% Customer share

#### Auto / LD Truck

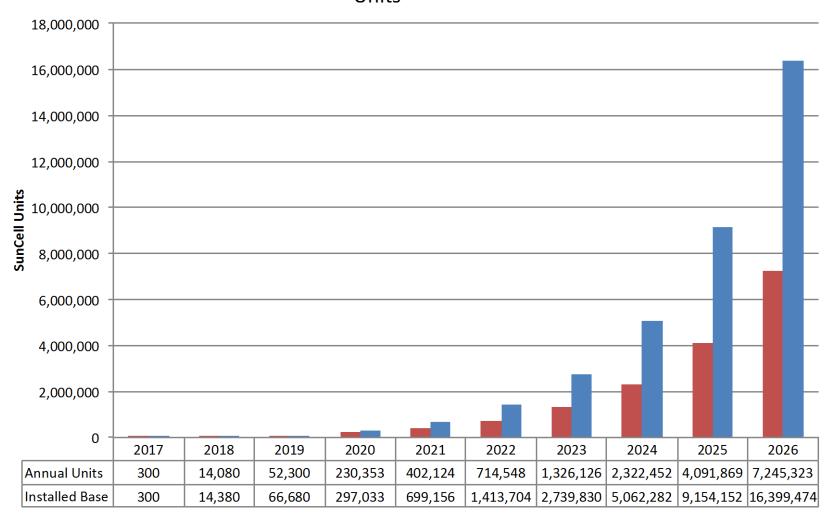
- Launch 2020 with 100-250kW SunCells
- Focus on mid-range cars, 150kW
- Global rollout
- Upfront fee to match ICE cost
- Customer has immediate payback
- Lease rate of \$0.002 per mile /kW PLUS
   20% of time as generator at \$0.05/kWh
- Revenue share generation 60%/40%



#### Financials – SunCell Units



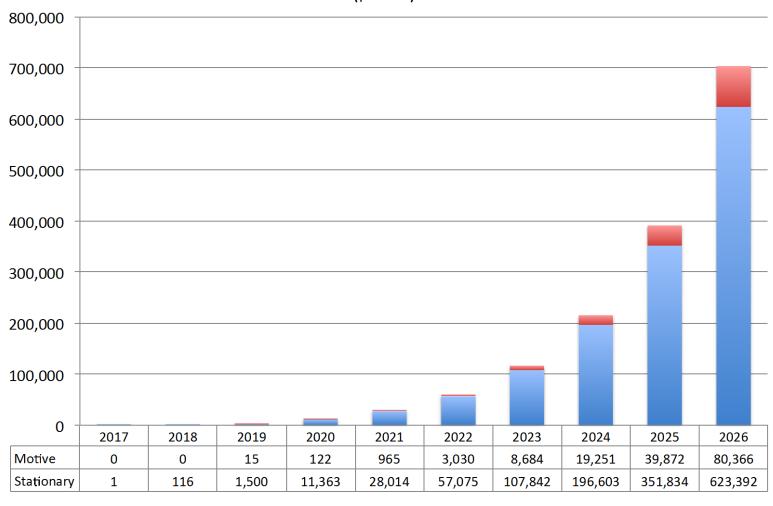
#### SunCell Total Units





## Financials – SunCell Revenue

## Brilliant Light Power Sales (\$ million)



■ Stationary ■ Motive

## Partnership Business Model



# Partners

#### Design

#### Detailed Design

- Test & Validation
- Certification
- Regulations
- Life Testing
- Safety
- IP to BrLP

#### Manuf.

- ContractManufacturing
- Depot Repair
- Sell ONLY to BrLP
- SupplierManagement
- Asset Management
- Mfg Engr.
- IP to BrLP

# Power Partner

- Inverter
- DER Grid\*
- Urban Grid
- Telemetry
- Support

#### Service

- Install Certs
- Field Service
- Regional Needs
- IP to BrLP

#### Distribution

- Territory Sales
- Inventory
- Government Relations

#### Brilliant Light Power

- Finance
- Legal
- HR
- Marketing

- Innovation
- Supply Chain
- Service & Support

- BD Stationary
- BD Motive
- BD Other

<sup>\*</sup>DER: Distributed Energy Resource

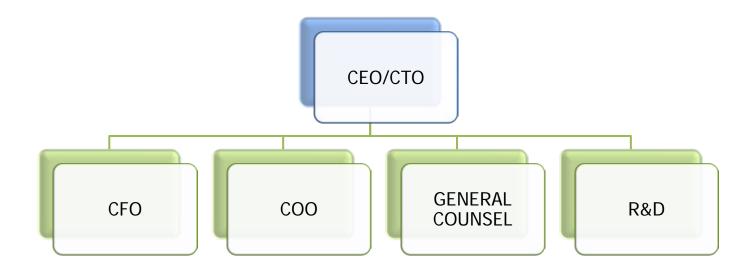




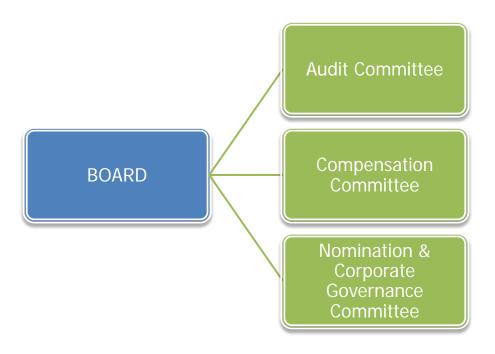
- CFO
- COO
- Innovation VP
- BD VP Major Markets Leader
  - International
- Supply Chain VP
- Legal VP SEC, Patent & Corporate
- Service & Support VP
- Marketing VP PR, Government Affairs
- Human Resources Staffing, Org. Development



# **Executive Org Chart**



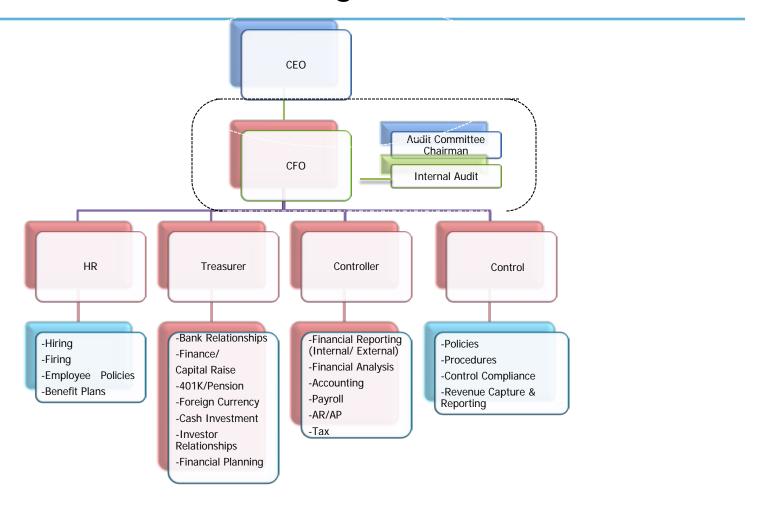
# **Executive Org Chart Continued**



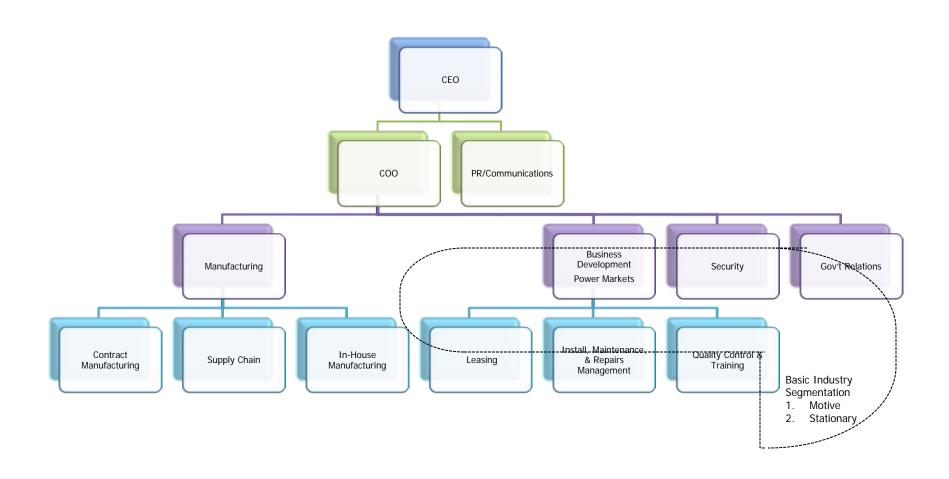


# **BLP Finance and Accounting**

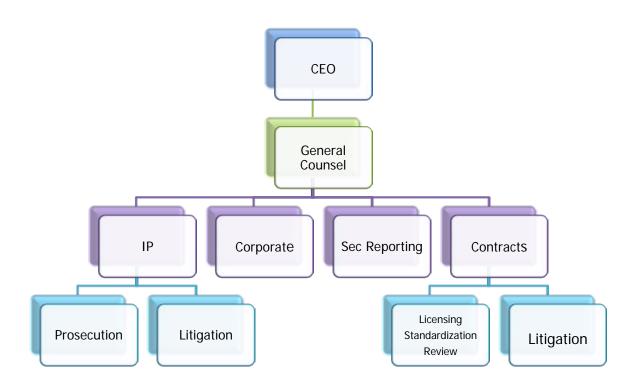




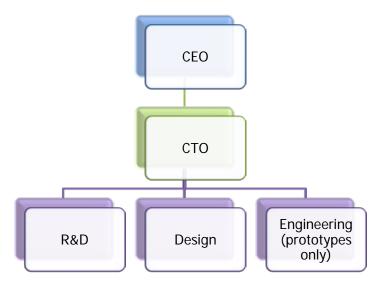
# Operational Org Chart



# Legal Org Chart



# Technical Org Chart



# Product Development

**Product Development Committee** 

The purpose of the committee is to forge a consensus across the organization on:

-What product to make
-Technical attributes of product
-Cost target for product
-Timing of commercial availability
of product
-Pricing of product

## **Business Model**



- Simple, Clean, Affordable Electricity
- Always on 7/24/365
- Lease with upfront install fee
- End users with long term contracts and relationship
- Self-financing with front-end fees and <90 days payback</li>
- BrLP manages technology and partners, end users very limited risk
- Partnership based value chain for speed & expertise
- Off grid with regulatory independence
- Adoption favorable due to climate change
- Expands reach of electricity to far reaches of the planet, transforming the ways we use energy



# Summary - Brilliant Light Power

- New, sustainable, nonpolluting energy
- Electricity Company of the future
- Extensive competitive position and customer value
- Off grid, freeing the system of high tariffs, regulation, and dependency
- Transitioning from research to product launch
- Building team, partners and suppliers for success

Brilliant's SunCell could be the most important energy technology of our generation



## Patents and Proprietary Technology Advantage

- Main priority is to file and obtain patents relating to the BlackLight Process, systems, and applications of the process.
- 68 issued patents provide coverage in many major energy markets (4 in the U.S.), and greater than 100 pending applications have been filed with important applications in U.S.
- World-wide applications related to the solid fuels process and thermal power plants were filed on April 24, 2008 and July 30, 2009.
- Worldwide applications on the breakthrough energetic plasma producing SunCells® entitled "Power Generation Systems and Methods Regarding Same", filed Jan 2014
- "Photovoltaic Power Generation Systems and Methods Regarding the Same"; application April 2014
- "Electrical Power Generation System and Methods Regarding Same", application May 2015
- "Ultraviolet Electrical Generation System Methods Regarding Same", application Dec 2015
- "Thermophotovoltaic Electrical Power Generator", application Jan 2016
- Corresponding applications have been filed or granted in over 50 foreign countries.
- The Company anticipates that the string of patent applications will provide broad patent protection, if these applications ultimately issue as patents.





## Thank you!

For more information please visit us at www.brilliantlightpower.com