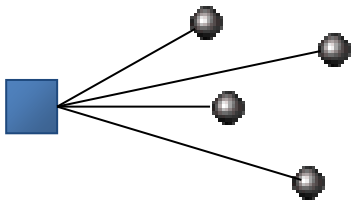
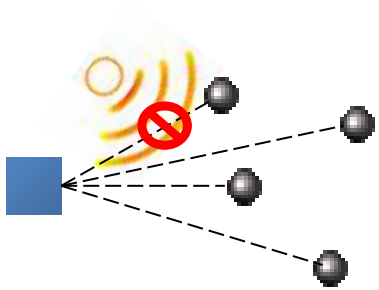
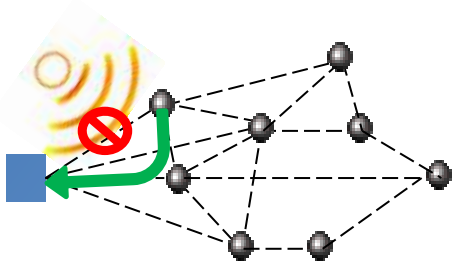
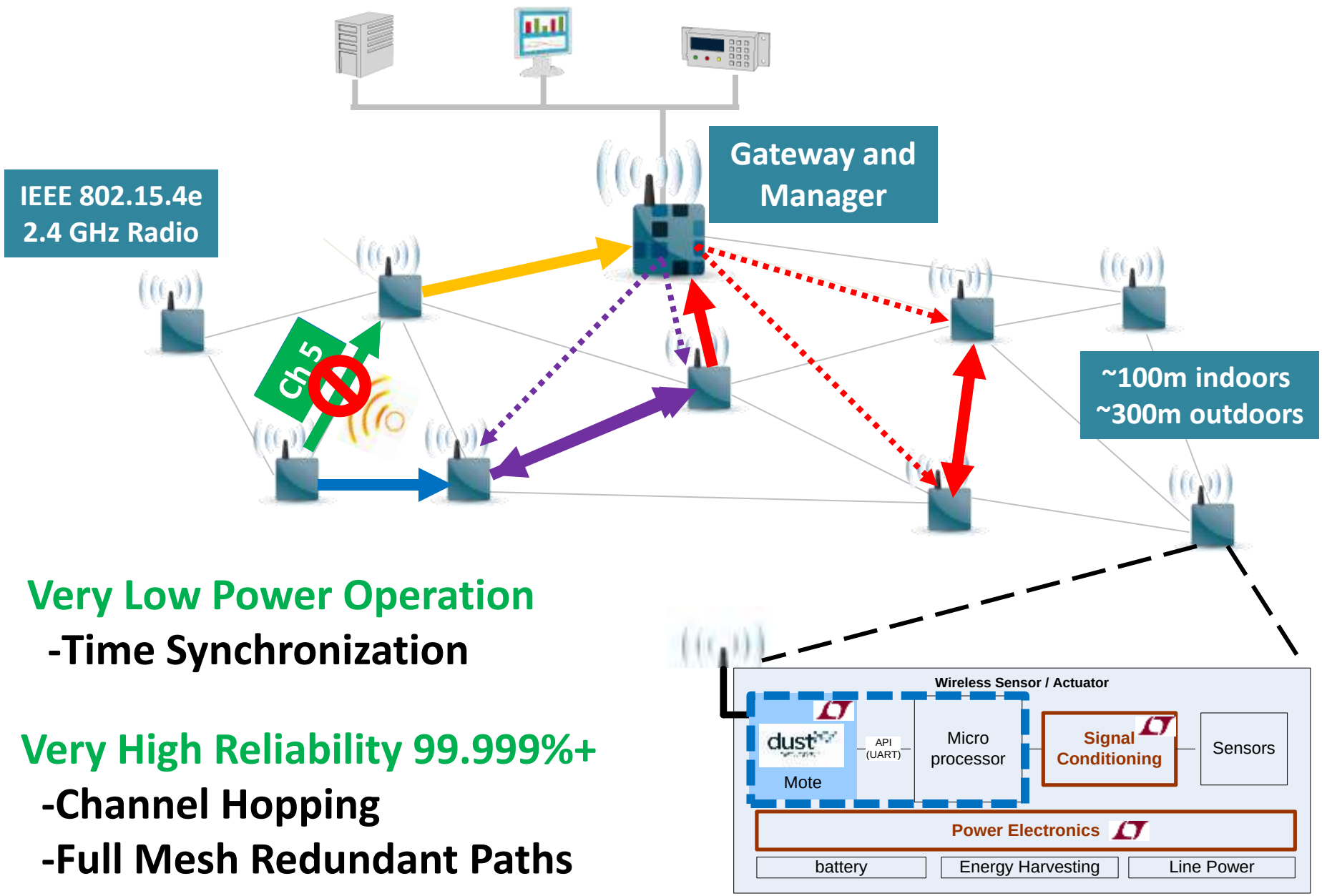
LINEAR TECHNOLOGY

dust networks™

Wireless Sensor Networks (WSN)

Wired Network	Wireless Network	Dust “Mesh” Network
		
Very High Reliability	Low Reliability	Very High Reliability
€€€€ Installation	€ Installation	€ Installation
Inflexible Network	Flexible Network	Flexible Network
Not “Green”	“Green”	“Green”

The Dust Wireless Sensor Network



Very Low Power Operation

-Time Synchronization

Very High Reliability 99.999%+

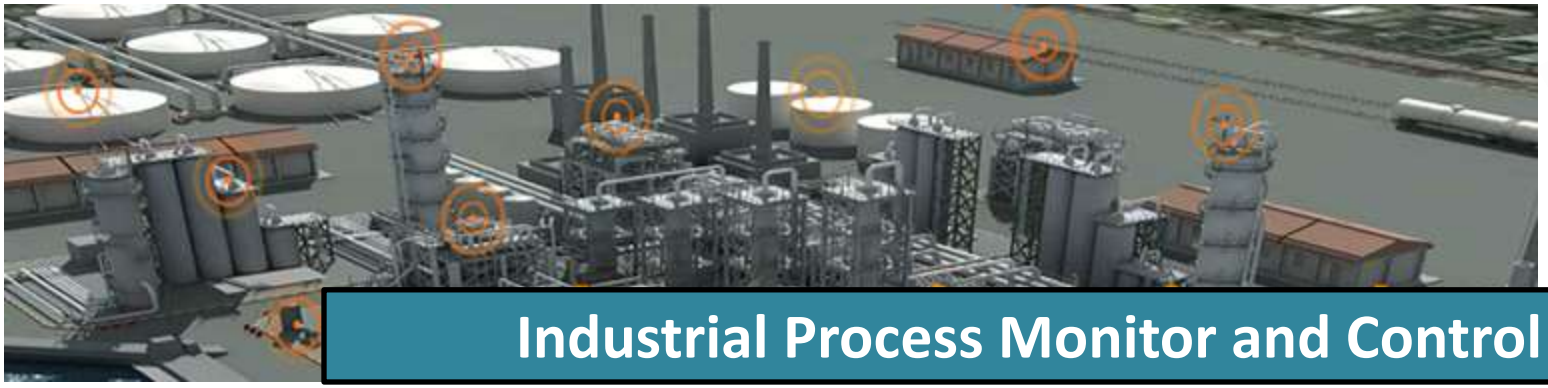
-Channel Hopping

-Full Mesh Redundant Paths

End Market Applications

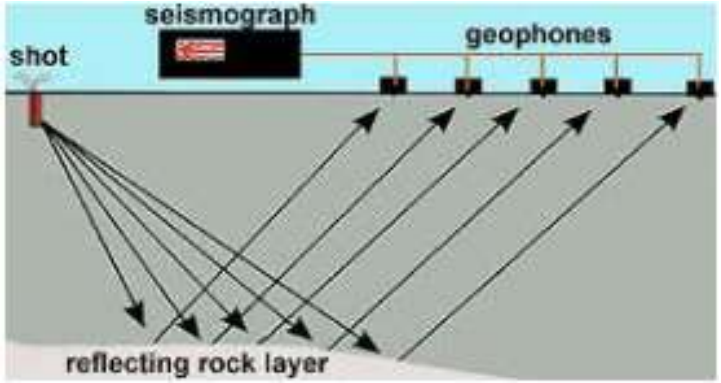
Applications – Traditional Wired Sensor Replacement

WirelessHART



Industrial Process Monitor and Control

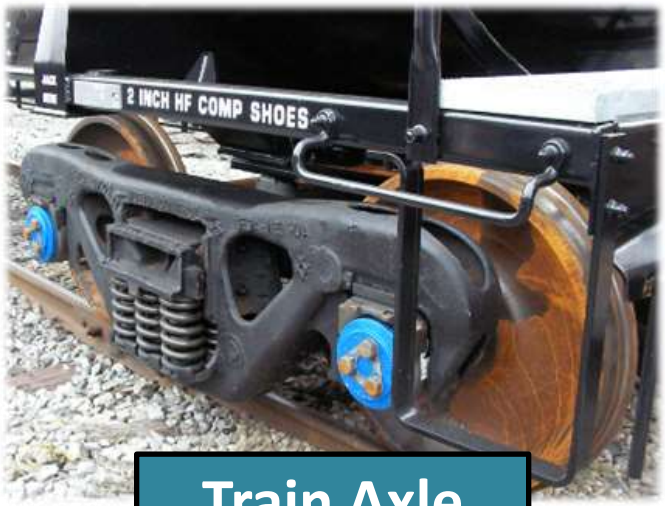
"A wired sensor costs 10X more to install than a wireless sensor"



Seismic Oil Exploration

Particulate / Gas Monitoring

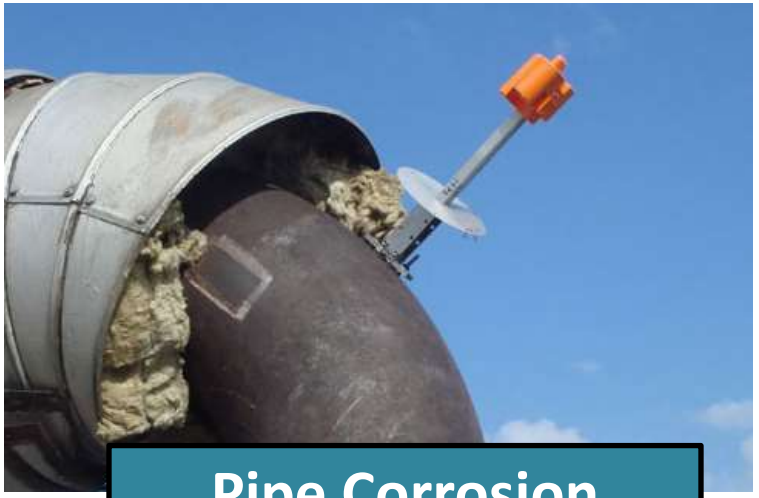
Applications – Condition Monitoring



Train Axle

Mining Conveyors

Turbines



Pipe Corrosion

Applications – Social Infrastructure

Intelligent Parking Solutions

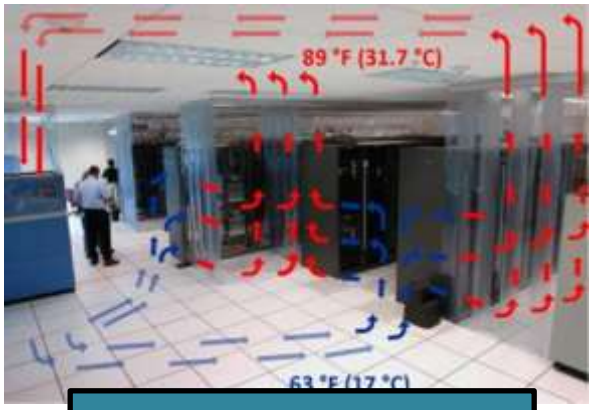
Bridge/Tunnel Safety Monitoring

Traffic Control Systems

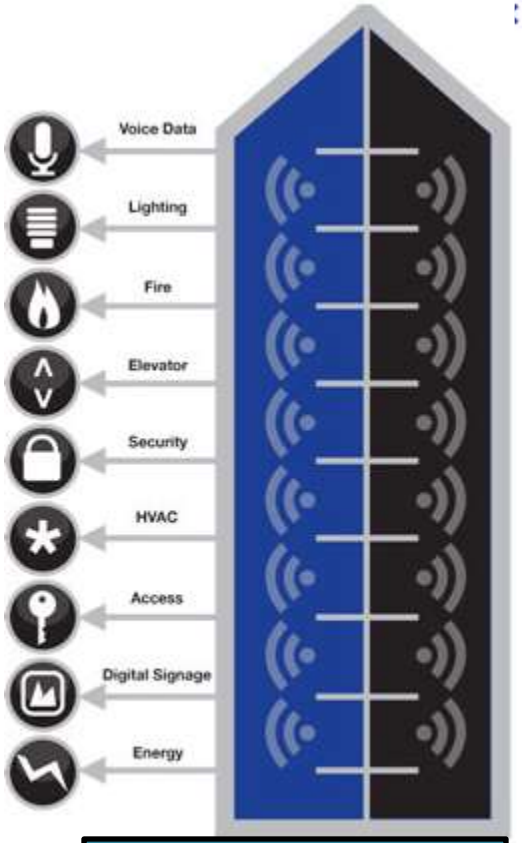
Applications – Intelligent Energy

Solar Field
Monitor & Control

Energy Usage
Monitor & Control



Data Center
HVAC Control



Intelligent
Building
Control

Web Links for Applications

Palau Sant Jordi Stadium
Barcelona, Spain
Load Sensing

Emerson Extreme
Various Places

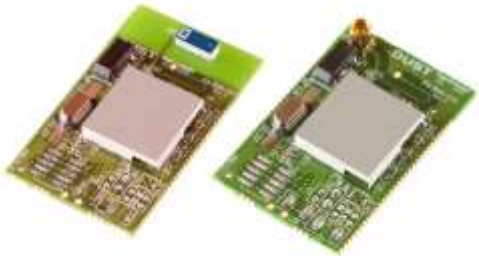
Products

Managers and motes

SmartMesh WirelessHART

LTP5903-WHR
Embedded Manager
(PCBA)

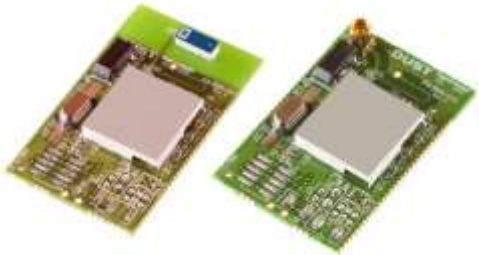
LTP5900-WHM
22-Pin Mote Module
(PCBA)



LTP5901-WHM (chip antenna)
LTP5902-WHM (MMCX)
Mote Modules
(PCBA)

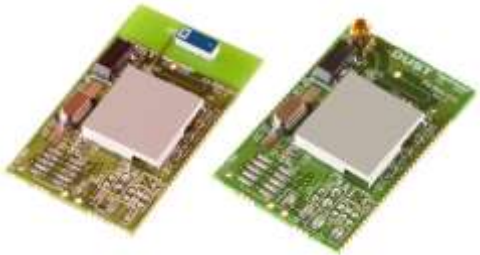
LTC5800-WHM
Mote-on-Chip
(QFN)

SmartMesh IP



LTP5901-WHR (chip antenna)
LTP5902-WHR (MMCX)
Embedded Managers
(PCBA)

LTC5800-IPR
Manager-on-Chip
(QFN)



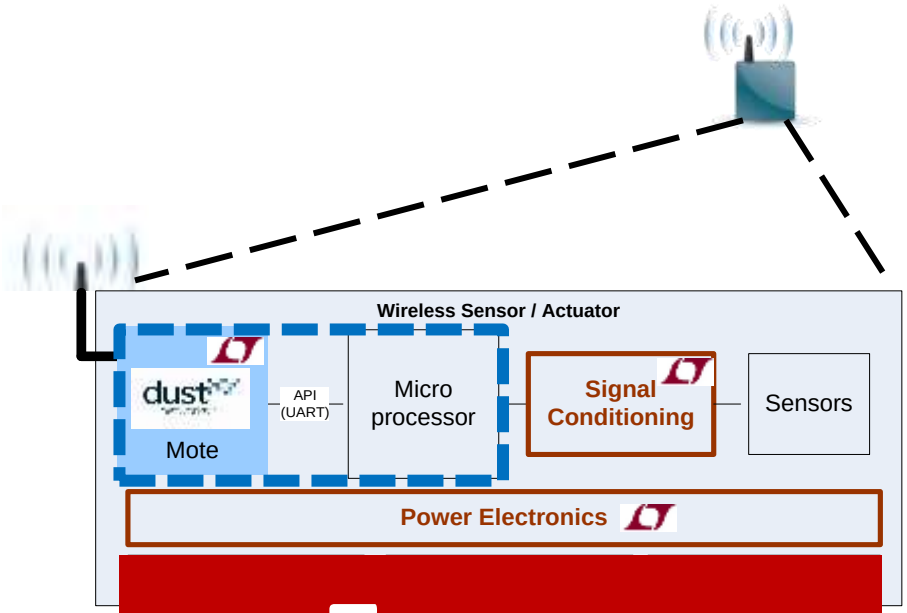
LTP5901-IPM (chip antenna)
LTP5902-IPM (MMCX)
Mote Modules
(PCBA)

LTC-5800-IPM
Mote-on-Chip
(QFN)

managers ***motes***

See product details, datasheets on www.dustnetworks.com

How to power WSN



Energy Harvesting

LINEAR TECHNOLOGY

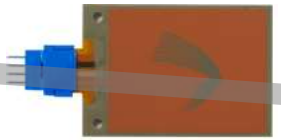
Energy Harvesting

What is Energy Harvesting?

Source	Transducer	DC/DC Converter	"Free" Energy

Temperature

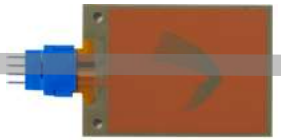
Vibration



Light

Magnetic

How Much Energy Can You Harvest?

Source	Transducer	DC/DC Converter	"Free" Energy
Temperature			0.2mW – 1.4mW
Vibration			Piezo 0.05mW – 0.5mW ElectMag 0.5mW – 10mW
Light			IN: 0.1mW – 1.0mW OUT: 1mW – 100mW
Magnetic			0.05mW – 0.5mW

How Much Energy Can You Harvest?

Source	Transducer	DC/DC Converter	"Free" Energy

Temperature

0.2mW – 1.4mW

1mW – 10mW

Vibration

Piezo 0.05mW – 0.5mW

lectMag 0.5mW – 10mW

What Is Possible with This Small Amount of Energy?

Light

IN: 0.1mW – 1.0mW

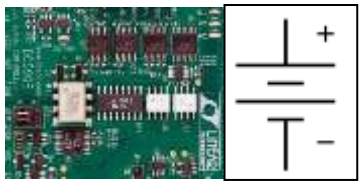
OUT: 1mW – 100mW

Magnetic

0.05mW – 0.5mW

What Can You do With Energy Harvesting?

Traditional Battery Powered System



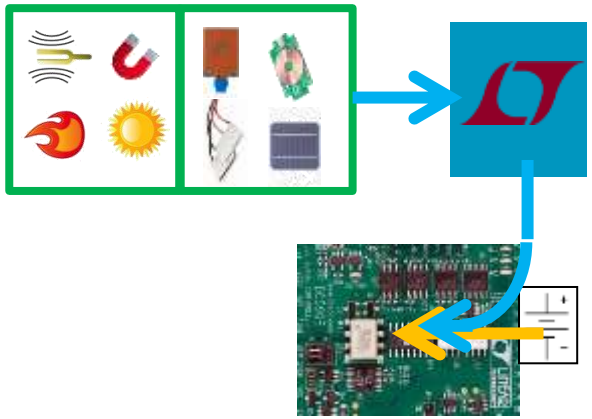
5-10 Year Battery Life

Battery Cost $$$ -> Maintenance Cost $

1-2 Year Battery Life

Battery Cost $ -> Maintenance Cost $$$

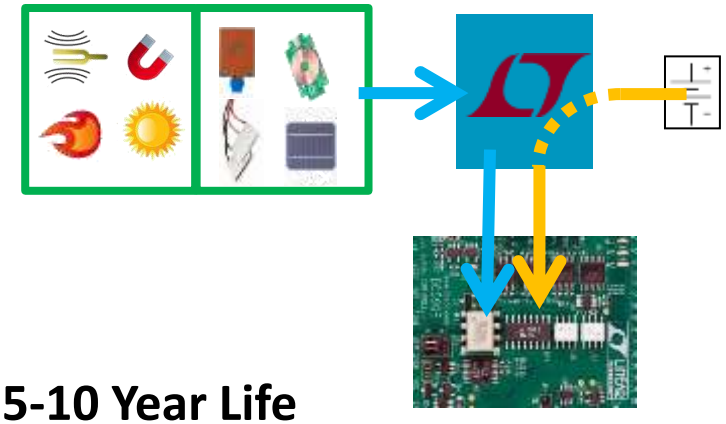
EH used in Parallel with Battery



5-10 Year Life

Battery Cost $ -> Maintenance Cost $

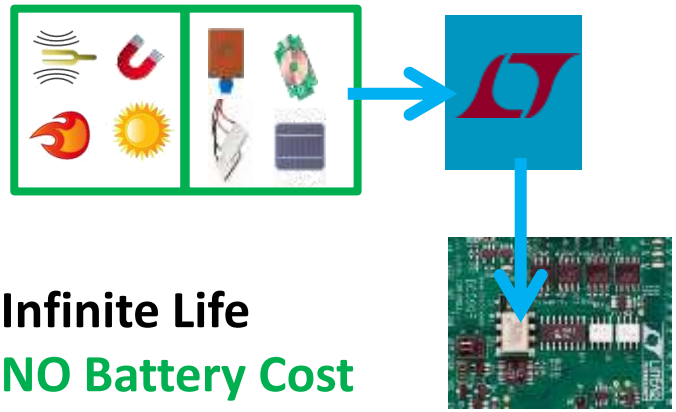
EH used with Battery Back Up



5-10 Year Life

Battery Cost $ -> Maintenance Cost $

EH used as the Only Source



Infinite Life

NO Battery Cost

EH Product line

Part Number	Description	Energy Sources
LTC3105	400mA boost converter with MPP control, 250mV Startup	
LTC3108	Ultralow voltage boost converter and system manager, 20mV Startup	
LTC3109	Auto-polarity version of LTC3108	
LTC3588	Ultralow power buck with integrated rectifier and clamp for AC sources	
LTC3330	Extension of LTC3588 by supply system, battery backup	
LT3652	2A solar battery charger with power tracking	
LTC4070	Nanoamp operating current Li-Ion battery charger	
LTC4071	Nanoamp operating current Li-Ion battery charger with battery disconnect	
LTC3388	Ultralow power buck	Lowest Power
LTC3459	Low power booster	Lowest Power
LTC3129	Low Power buck-boost	Lowest Power
LT6656	Nanoamp operating current Reference, usable as µPower LDO	Lowest Power
LTC2935	Nanoamp operating current voltage monitor	Lowest Power
LTC3331	LTC3330 with rechargable battery – **Coming soon!**	

Q & A