"Living Well, Off-the-Grid"

Llew Vaughan-Edmunds
Sr. Director

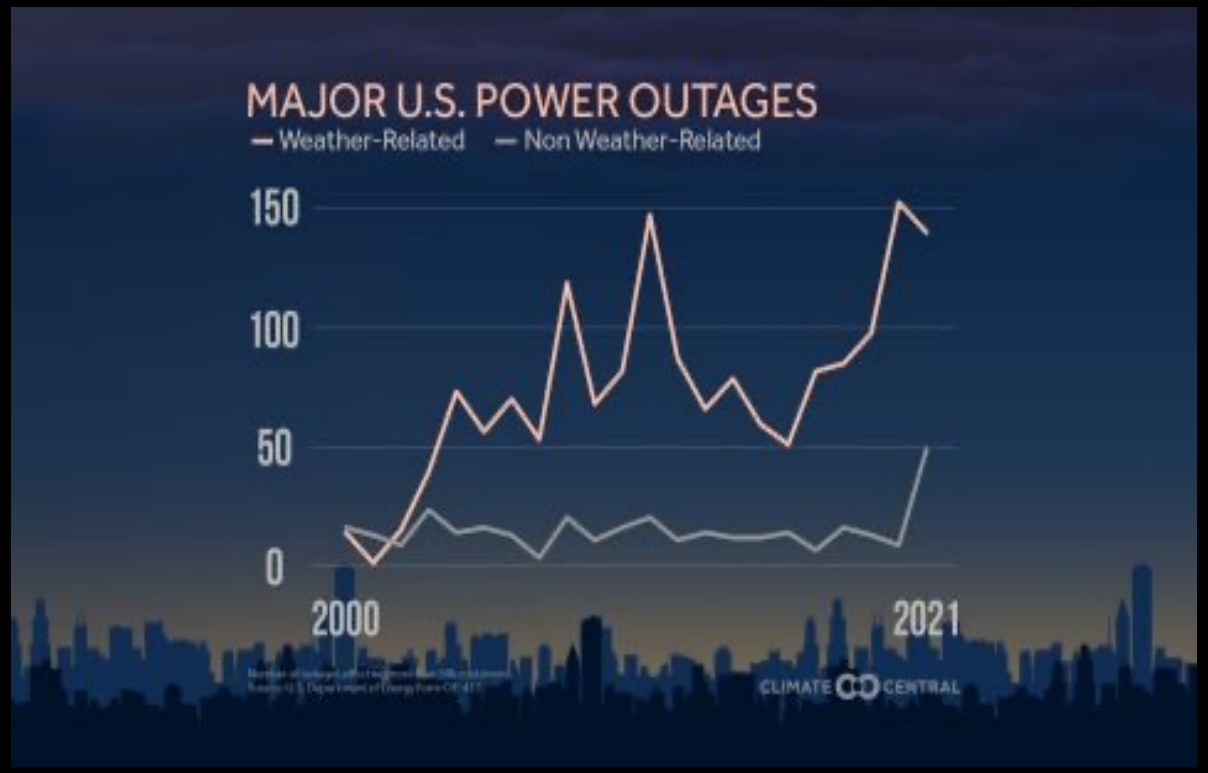
Navitas

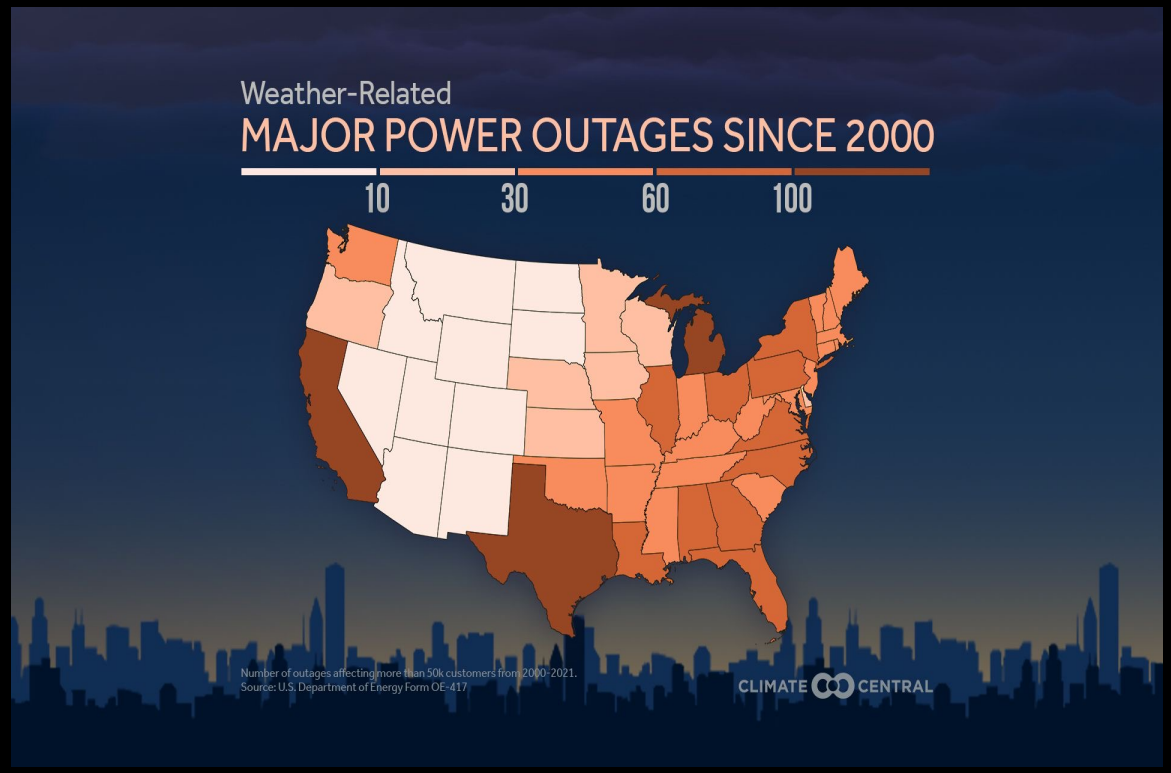
Energy • Efficiency • Sustainability

Contact: ir@navitassemi.com
Note disclaimers.

Power Outages are on the rise

Navitas

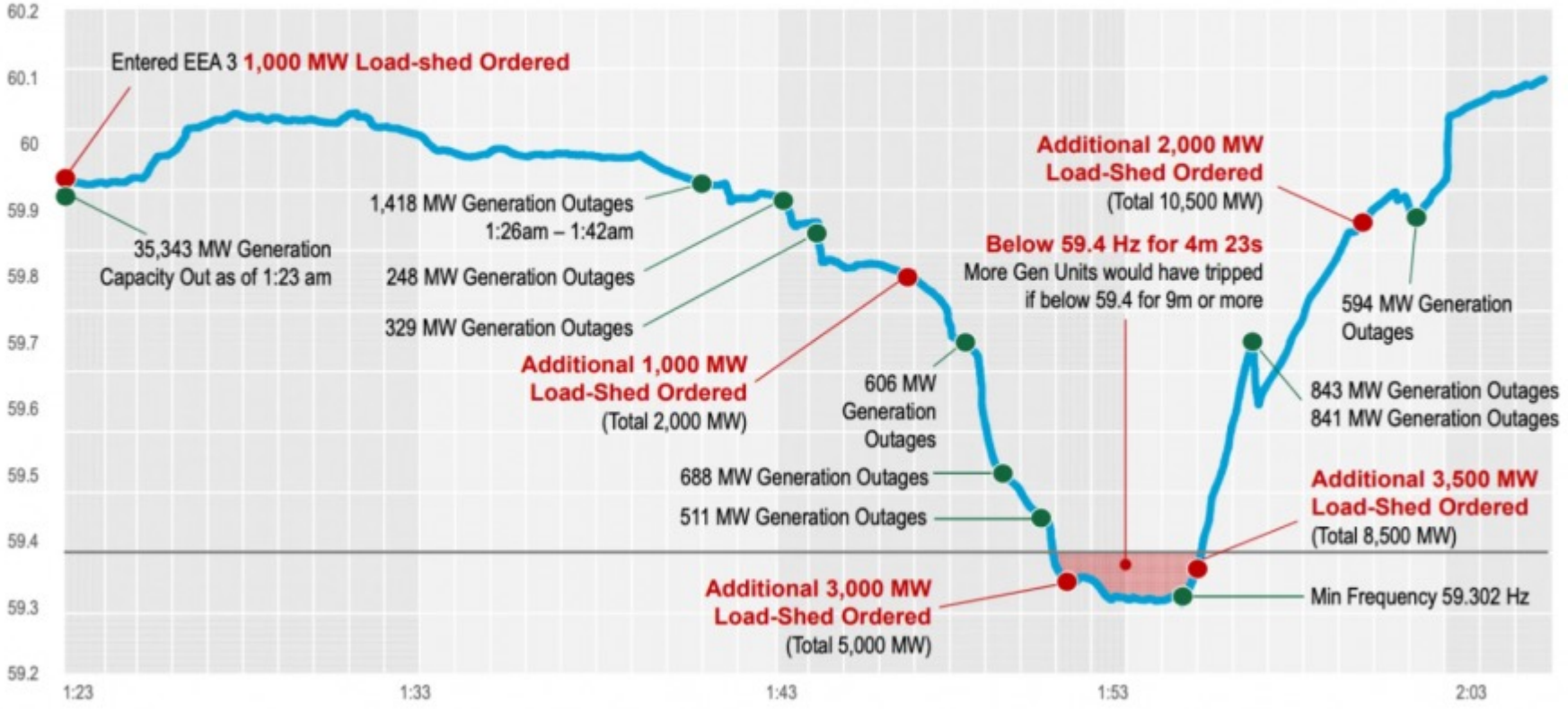




Life Can Be Unpredictable…

Navitas

Texas Power Grid, February 21st 2021



Electric Reliability Corporation of Texas (ERCOT)
December xxx 2022, link

...and Solar is a Growing Source of Power

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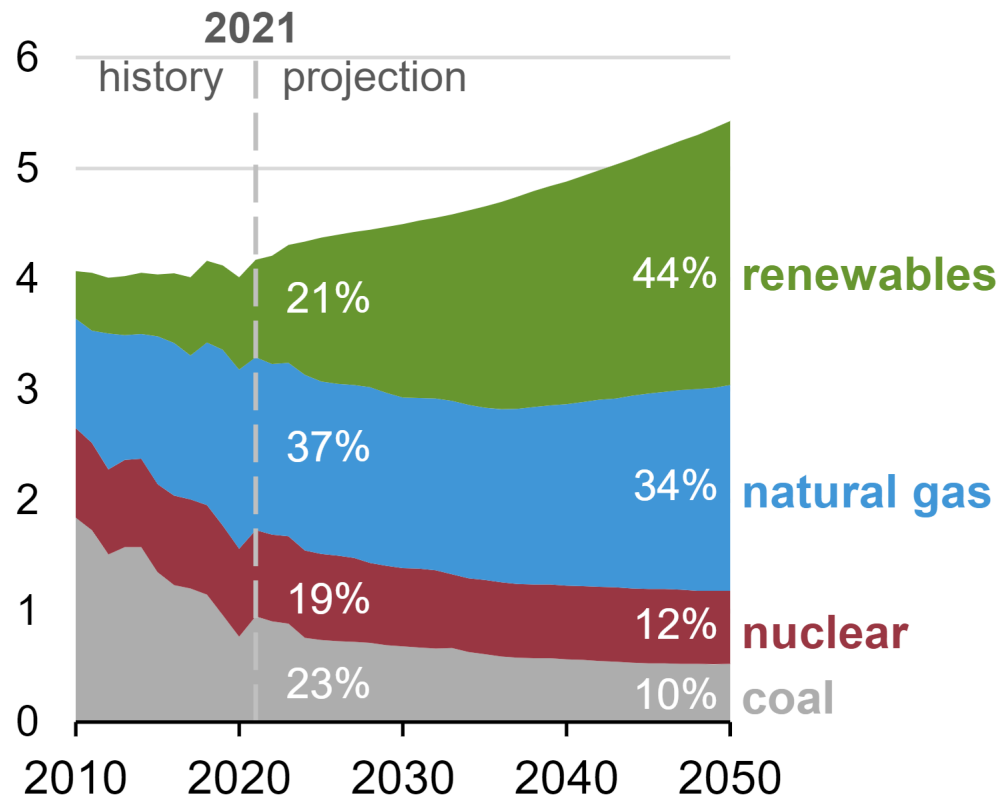
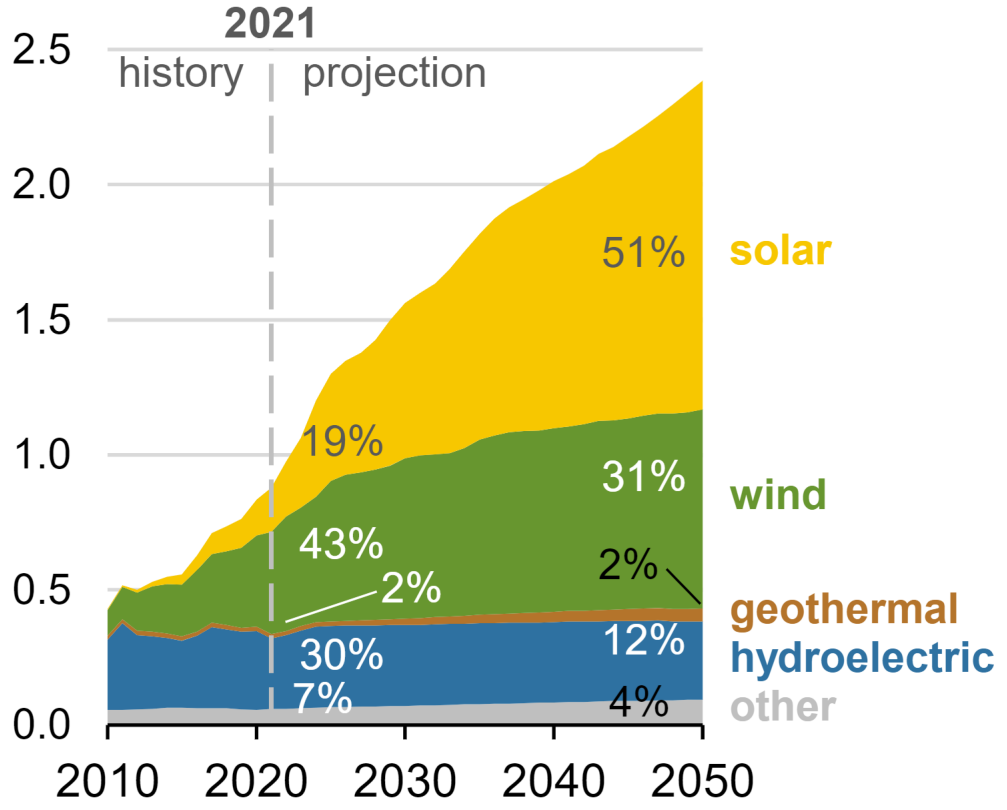
U.S. electricity generation
AEO2022 Reference case
trillion kilowatthours



U.S. renewable electricity generation
including end use
trillion kilowatthours

eia



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2022* (AEO2022)
Note: Biofuels are both shown separately and are included in petroleum and other liquids.

...But Supply & Demand Don't Match

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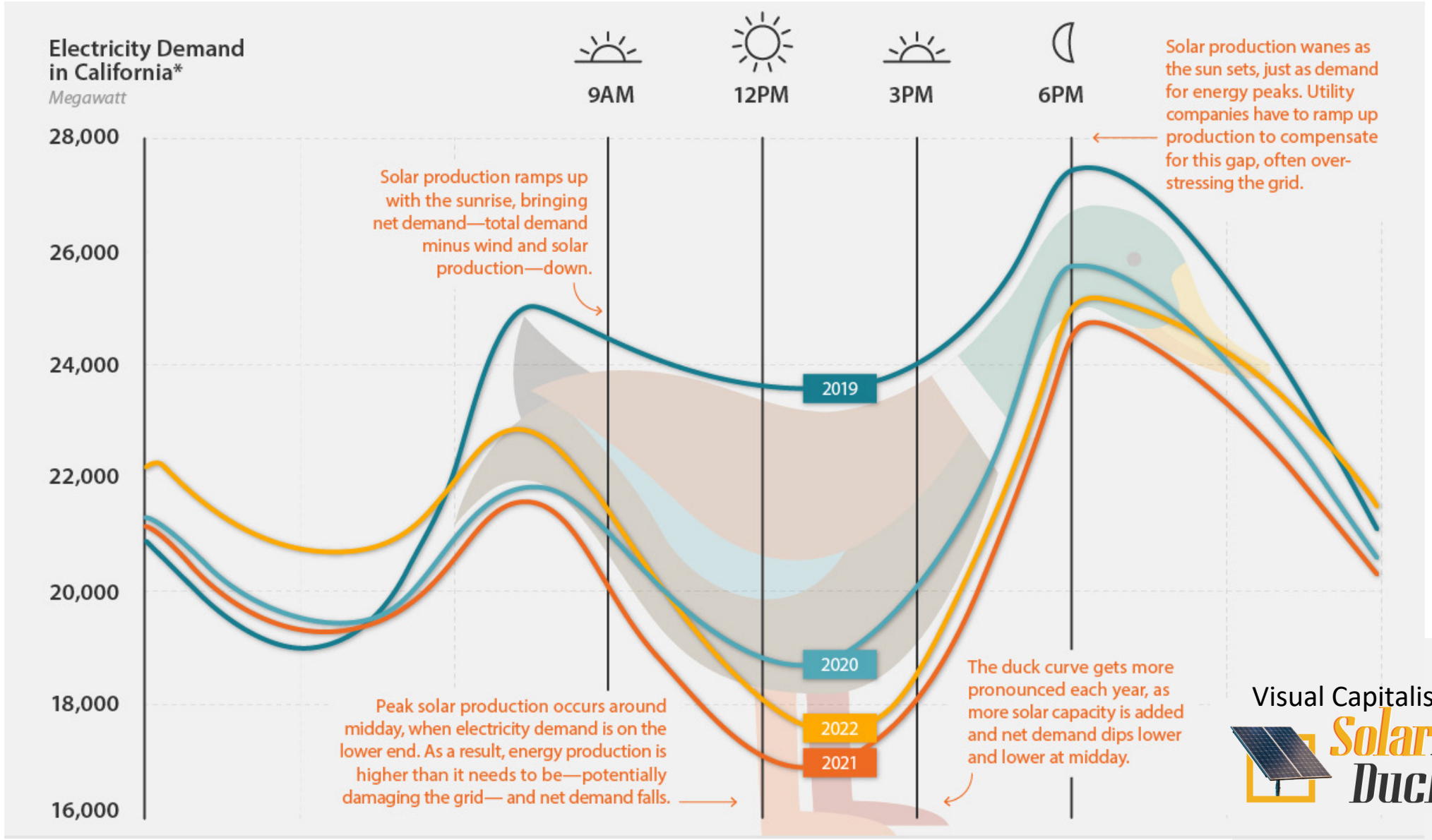
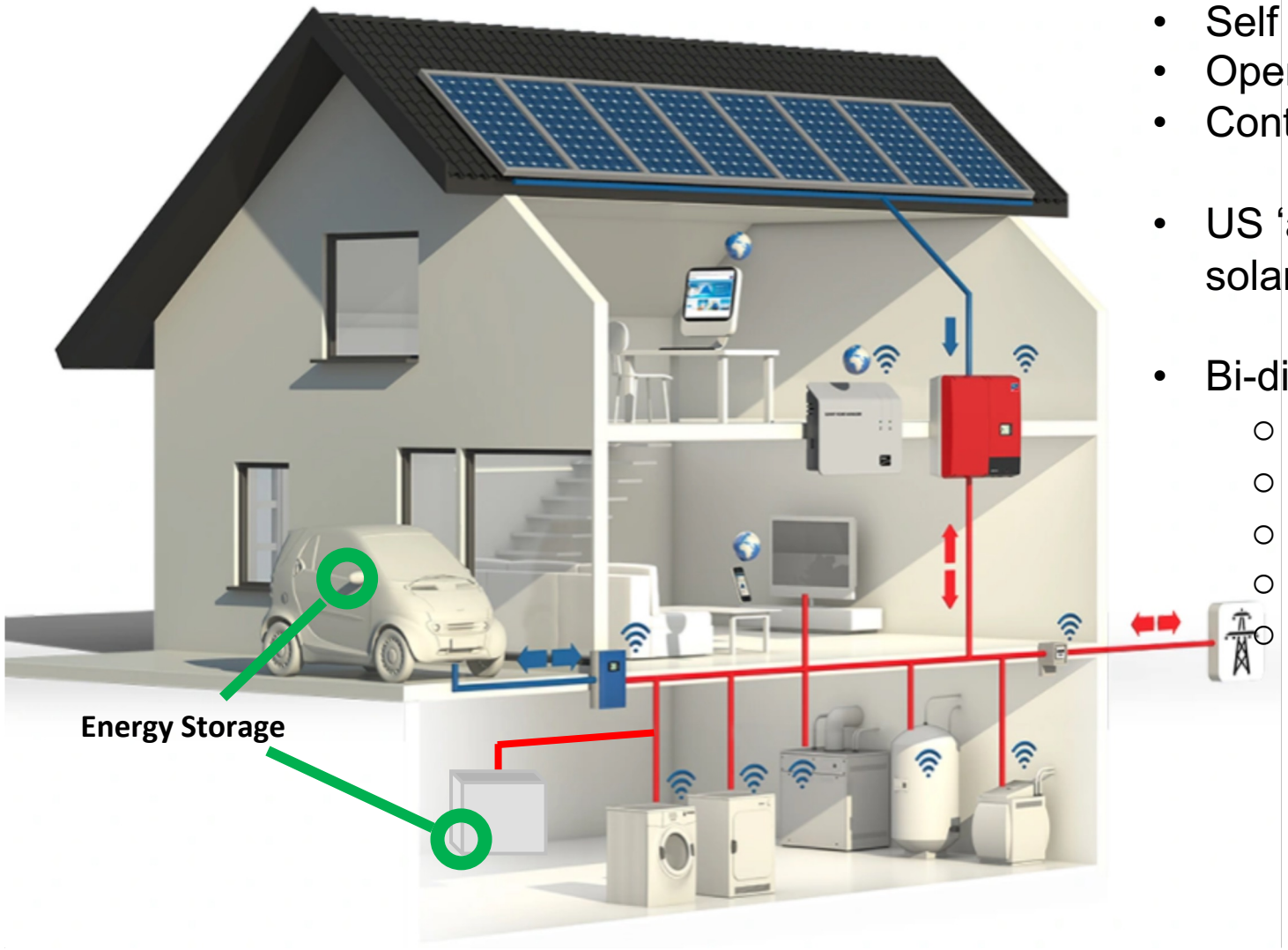


Visual Capitalist Elements

Solar Power Duck Curve

Domestic Micro-Grid with Energy Storage(s)

Navitas



- Self sufficient energy system
- Operates independently
- Contains it's own energy source

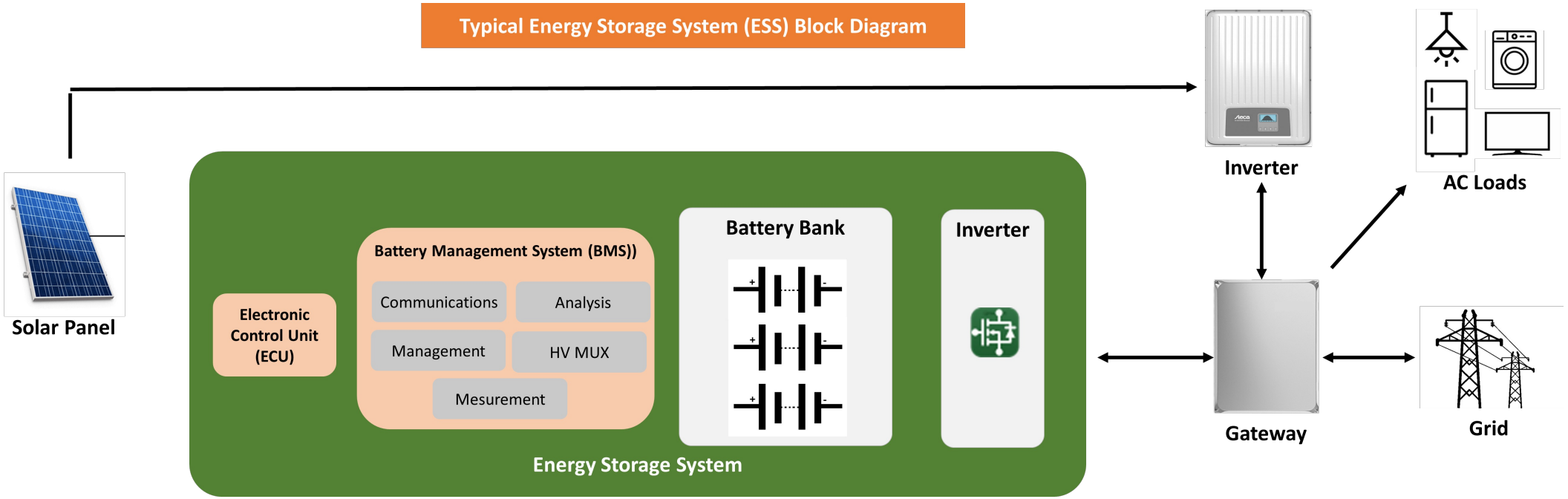
- US 'attach rate' for storage capability sold with solar panels, up from 9.5% to 17.1% in only 18m

- Bi-directional on-board chargers now in:
  - Nissan Leaf
  - Ford F-150 Lightning
  - Hyundai Ioniq 5
  - Kia EV6
  - Mitsubishi Outlander PHEV

Bi-Directional Battery Storage

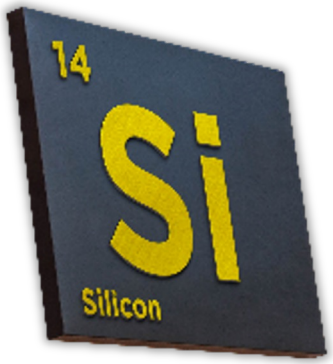
Navitas

- Approximately 30% of electrical usage happens during solar production hours.
- A Battery Energy Storage System (BESS) stores electricity from the sun (or other renewable energy sources) for later use, to reduce electricity costs, back-up unstable grids during blackouts, and support additional electrical demands.



Next-Gen Power Semis for Micro-Grids

Navitas



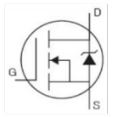
Up To	Up To	Up To	Up To	Up To	Up To
20x	**3x**	**40%**	**3x**	**3x**	**20%**
Faster Switching	Smaller & Lighter	Energy Savings	Higher Power Density	Faster Charging	Lower System Cost

Note: Navitas estimate of GaN- & SiC-based power systems compared to silicon in the 2024-2025 timeframe.

The GaN Revolution: Ultimate Integration

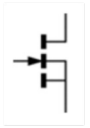
Navitas

Silicon FET



- Old, slow
- High Q_g
- High C_{OSS}
- F_{SW} < 100 kHz

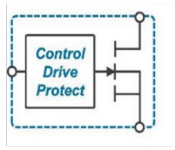
Discrete GaN



- Exposed gate
- External gate drive
- dV/dt sensitivity
- Layout sensitivity
- ESD sensitivity
- Unknown reliability
- Unknown robustness

GaNFast™

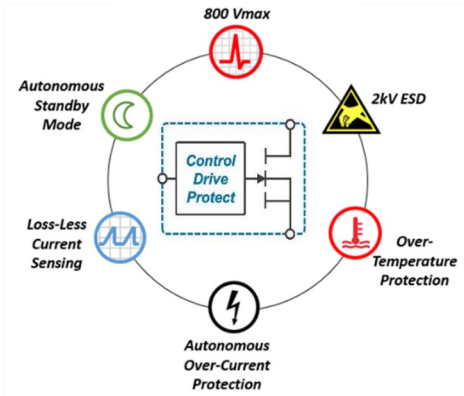
200-300 kHz



Internal Gate
Integrated Gate Drive
dV/dt Immunity
Layout Insensitive
2 kV ESD rating
Proven Reliability
Proven Robustness

GaNSense™

500 kHz

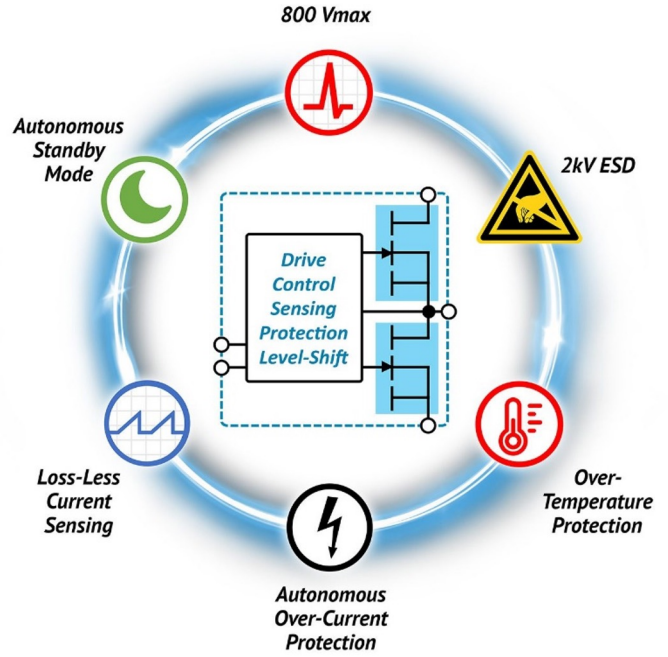


GaNFast plus:

Autonomous Standby
Autonomous Protection
Loss-less Current Sensing
High Precision
High Efficiency

GaNSense Half-Bridge

1 MHz



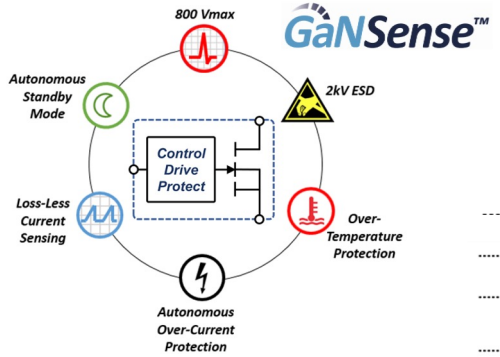
GaNSense plus:

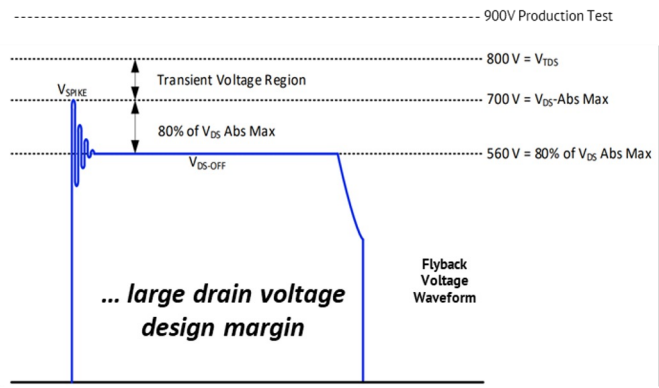
Highest integration
- integrated HS and LS FETs
- Integrated level-shift isolation
- integrated boot-strap
- Shoot-through protection
- Enlarged cooling pads

Fastest switching
Highest efficiency

Foundational Reliability

- ***Design*** for Reliability
  - Integrated drive, sensing and protection
  - Component reliability, and ***system*** reliability



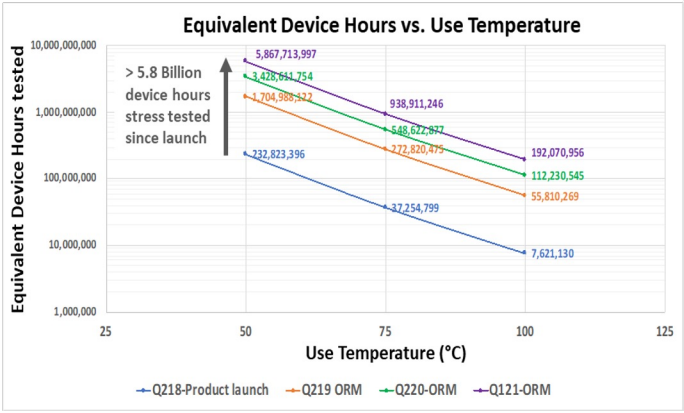


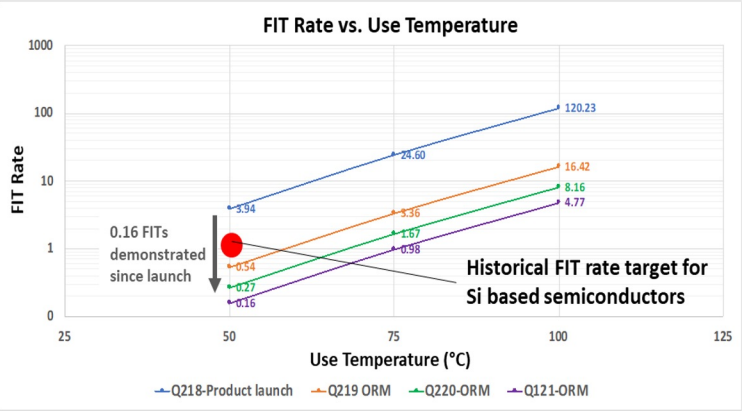
- ***Testing*** for Reliability:
  - Proprietary production test methods
  - GaN ICs tested 400% (multi-temp, high-frequency)

- ***Characterization*** for Reliability
  - Exhaustive, proactive, and unique Navitas reliability program
  - 5.8 B equivalent device hours tested(1)
  - Proprietary, highly-accelerated Op-Life, plus JEDEC, plus ELFR monitoring
  - Founder member of JEDEC JC70.1

Reliability Statistics

Calculated for High Line condition using HTOL (ZVS) results





(1) As of September 2022

High Volume, High Quality

70,000,000+ shipped,(1) 300,000,000,000+ device hours in the field

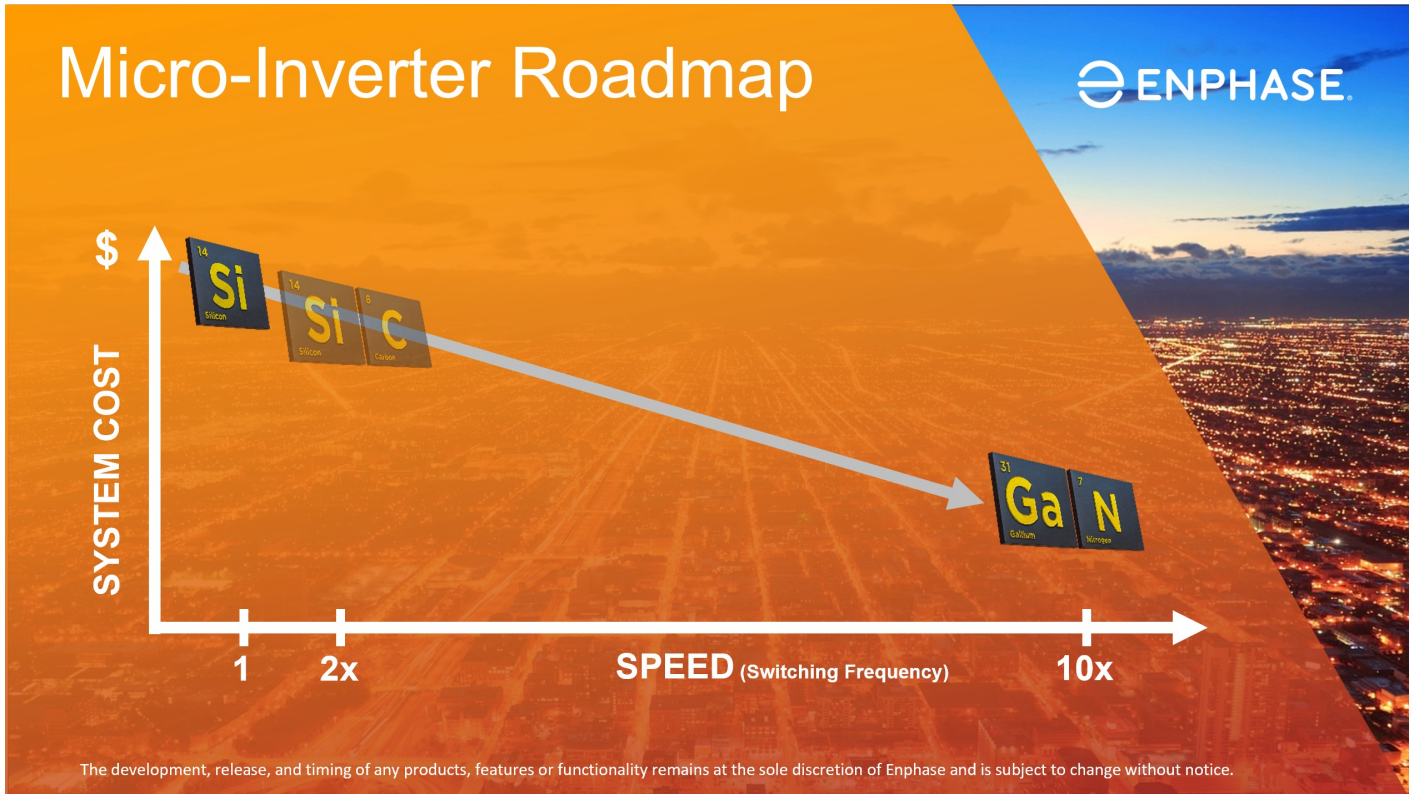
<u>0</u> (zero) field failures(2)

Industry's only 20-year warranty, 10x longer than typical

(1) Shipments and quality stats as of December 2022.
(2) Zero reported GaN-related field failures

GaN Optimizes System Cost for Micro-Inverters

- Converts low-voltage DC to 50-60 Hz, 110 V / 220 V AC power
- 1 per panel
- Power increasing as panel efficacy improves, from 250-300W up to 450-500W
- Silicon to GaN upgrade at higher switching frequencies has significant cost reductions, estimated at 25% per micro-inverter(1)



Enphase Energy slide from Navitas New York Investor Meeting 2021

(1) Navitas estimate

GeneSiC™

Patented Trench-Assisted Planar SiC MOSFETs

Navitas

Up to 6.5 kV

Largest range of SiC FETs & diodes
(650 V to 6.5 kV)

Fast Switching

Highest efficiency hard-switch, soft-switch
(Lowest E_{ON}, E_{OFF}, E_{ZVS} losses)

Cool Operation

Lowest $R_{DS(ON)}$ at high temperature
(25% lower than industry typical)

Cool.
Fast.
Rugged.

100%-Tested Robust Avalanche

Highest published capability to handle excess energy in fault condition

Long Short-Circuit Withstand Time

World-class survival duration in fault condition

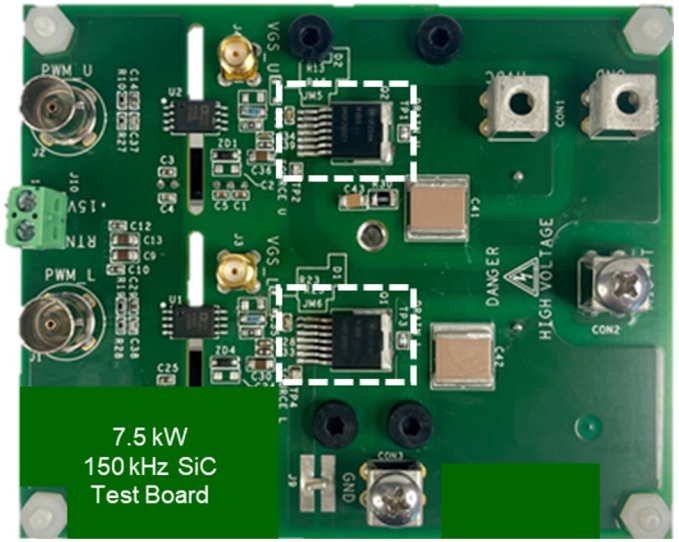
High-Power Paralleling

Matching currents (Stable V_{TH})

Based on Navitas testing of 1200V SiC MOSFETs vs. competitor products

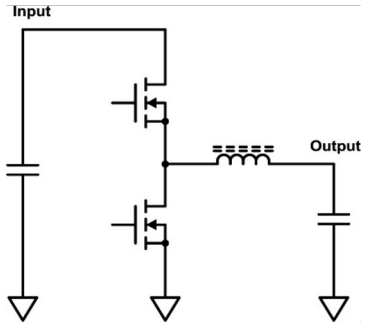
Faster, Cooler, Longer Lifetime

Navitas

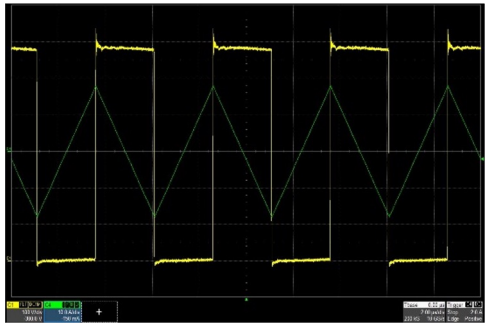


Test Board

- GeneSiC trench-assisted planar FET vs. Competitor SiC FET
  - 1200 V, 40 mΩ, D2pak in half-bridge
  - Represents 7.5 kW DC-DC converter (e.g. data center, EV)
  - 150 kHz switching = ~10x faster than Si IGBT example
- GeneSiC: **>80% energy savings (>3,000 kWh/yr) *vs* *Si IGBTs***
  -25°C cooler = 3x longer life *vs other SiC*
  (reduced maintenance / repair costs)



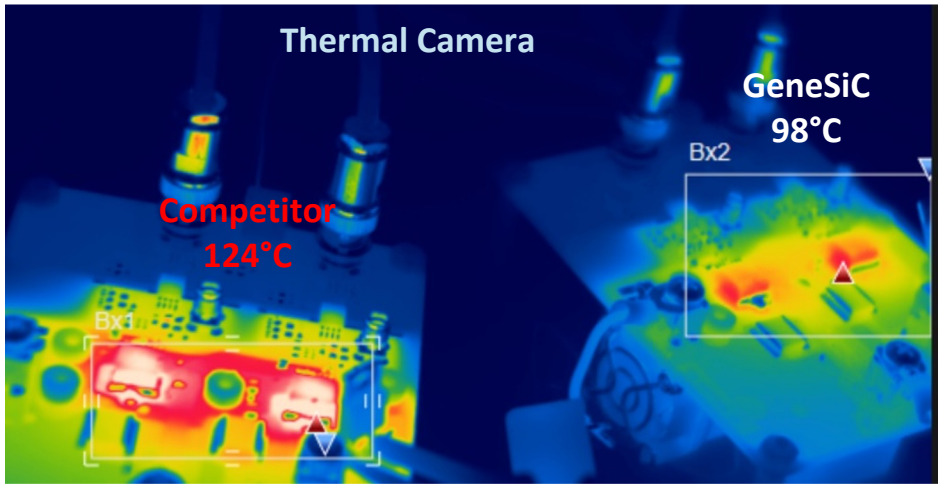
Test Circuit
(1-phase of 3-phase motor drive)



Switching Waveforms
(40 A pk-pk, 20 A turn-off}

Competitor SiC
45 W system loss

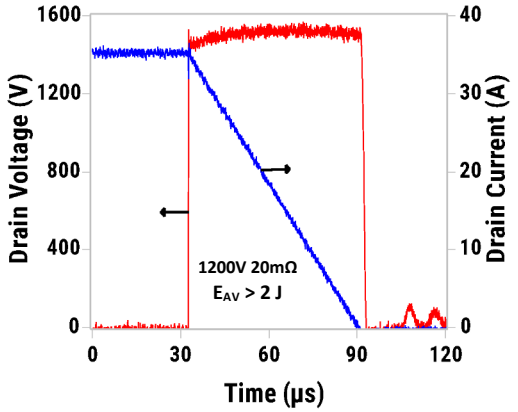
GeneSiC
40 W *system* loss
-30% *SiC* loss



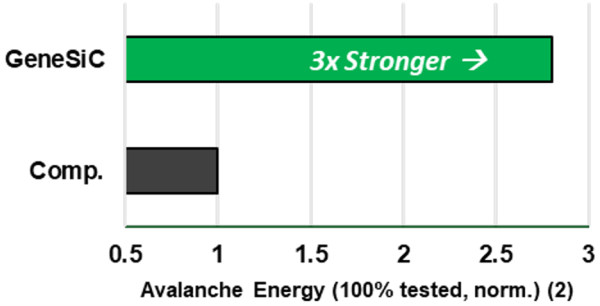
High Quality, High Reliability

100%-Tested Avalanche

Highest published capability to handle excess energy in fault condition

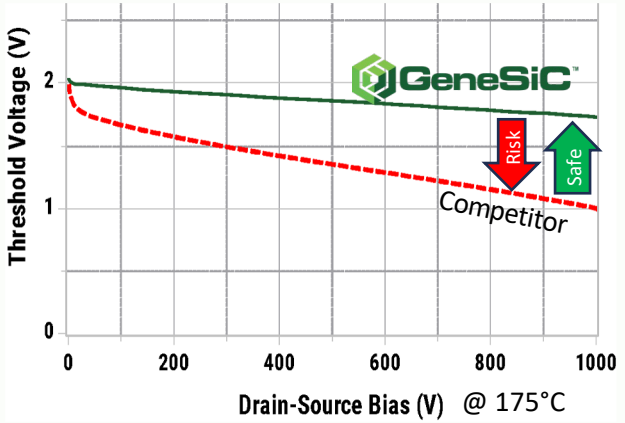


Critical in applications like motor drives to withstand unclamped inductive load (UIL) energy dump in situations like motor open-circuit (O.C.)



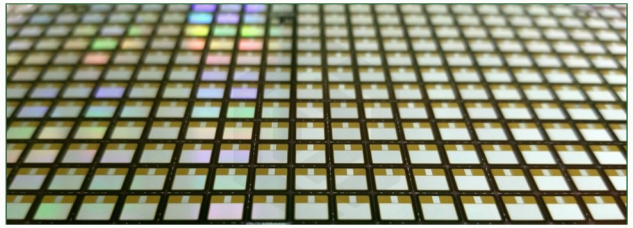
High Power Paralleling

Matching currents
(Stable V_{TH})



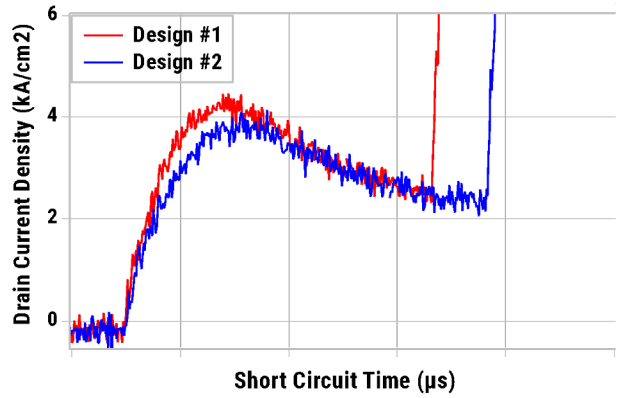
Competitor products allow threshold voltage to drop under high voltage, creating risk of turn-on error

GeneSiC packaged and bare-die FETs can be paralleled reliably for high-power applications

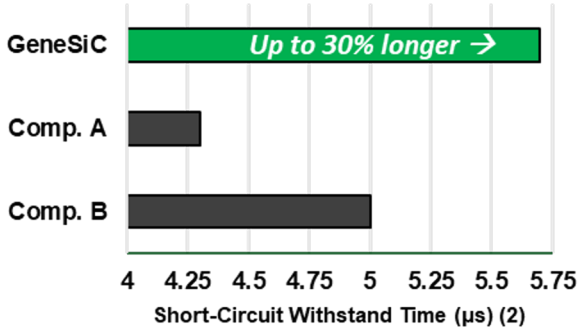


Long Short-Circuit Withstand Time

World-class survival duration
in fault condition



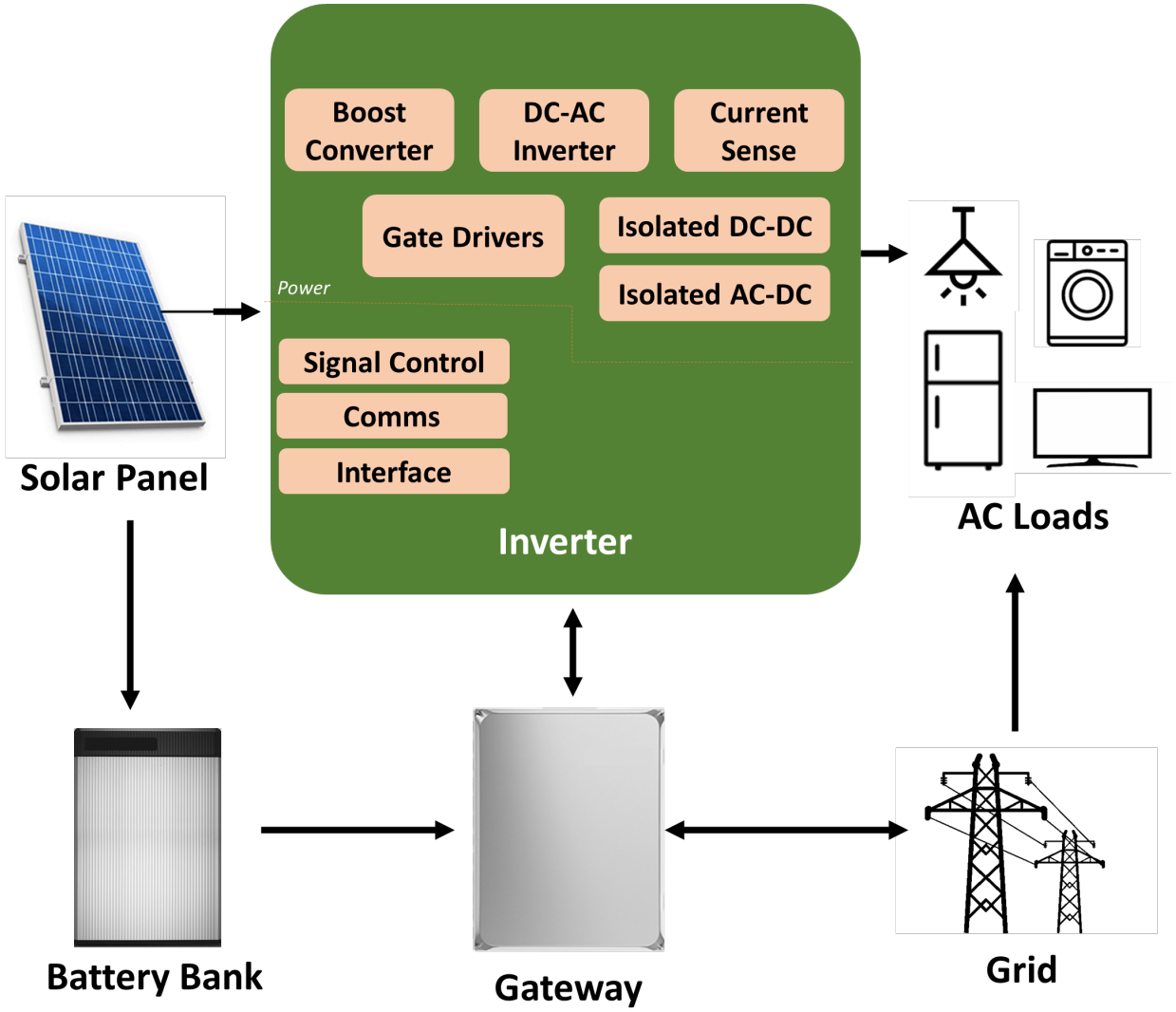
Critical to prevent failures like motor short circuit where the FET faces full voltage (V_{DD}) in ON-state.



1) *As of September '23, per GeneSiC records*
2) *1,200 V, 20 mΩ FET*

Zero reported GeneSiC-related field failures!

Example String Inverter with SiC



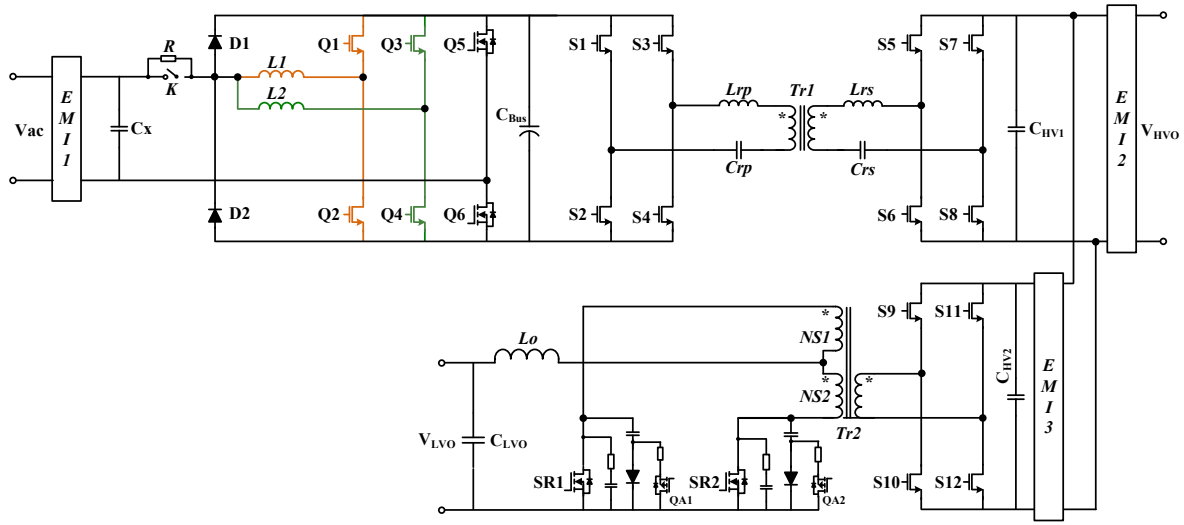
4.6 kW KATEK (Steca) Solar String Inverter

- GeneSiC 1,200 V G3R75MT12J MOSFETs
- 6x per inverter
- 65 kHz
- Bi-directional boost converters and H4-topology.

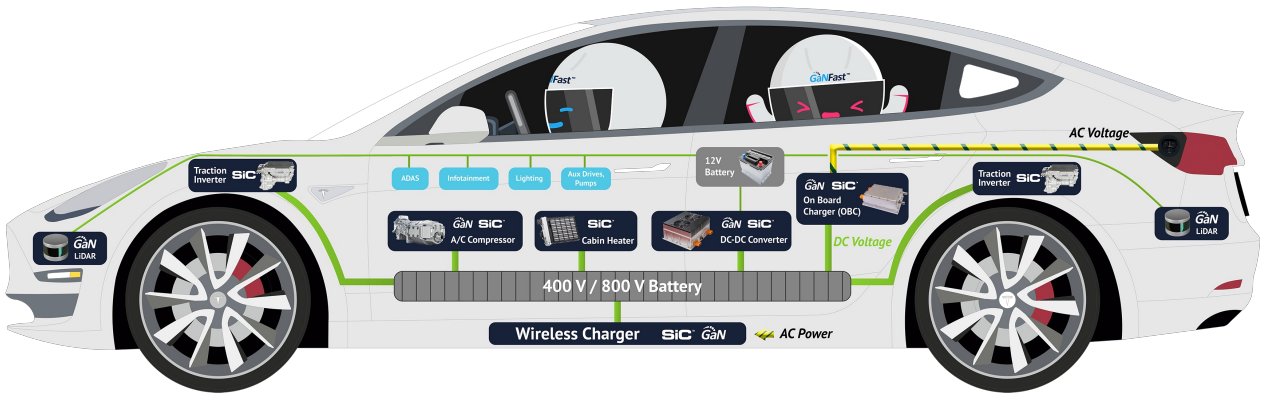
EV: 3-in-1 Bi-Directional OBC + DC-DC

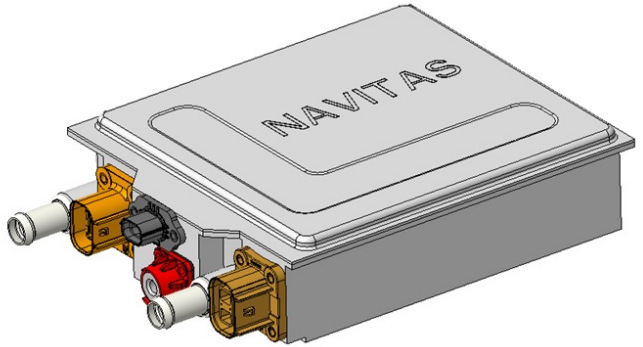
Navitas

- Bi-directional 6.6kW OBC/3kW DC-DC combo
- Optimized design with 650 V GaN ***and*** 1,200 V SiC
- Power density +50% (kW/L)
- Energy savings +10%
- Weight -15% vs prior best in class

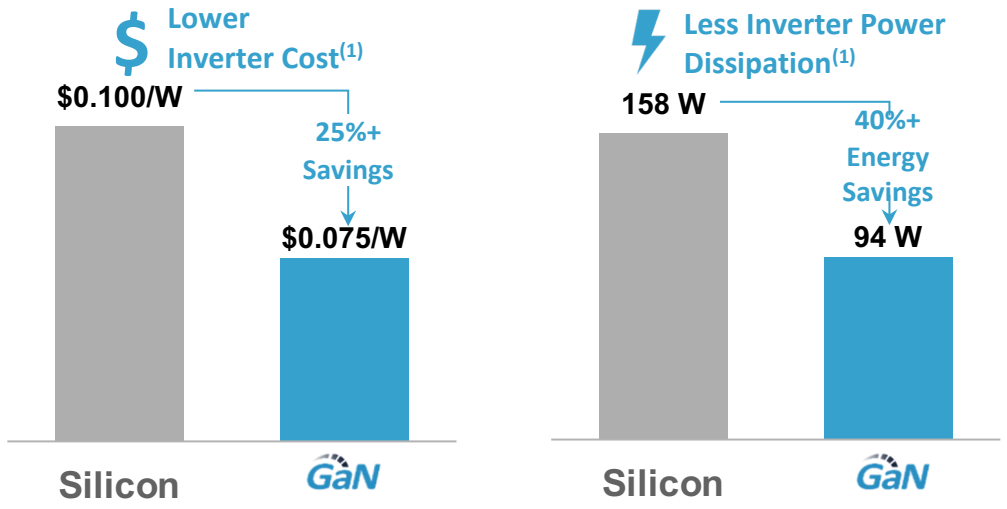


AC-DC + DC-AC + DC-DC





GaN + SiC for Solar & Energy Storage



(1) EnergySage Solar Marketplace, 2020.

Synergistic & Engaged Customers

Advanced Energy · Alpha power solutions · ENPHASE. · solaredge
steca A KATEK Brand · SUNGROW Clean power for all · CHINT · GOODWE
EXIDE TECHNOLOGIES · ENERGY storage system · GROWATT · KACO new energy.

Market Potential for GaN/SiC(2)

- 5-10kW Residential >$1.40B
- 1kW residential (micro) >$1.00B
- Energy Storage >$1.25B *(50% attach rate)*
- Commercial (string) >$1.00B
- >$4.65B

(1) Navitas est. 6.2 kW residential installation with silicon inverter at 97.5%, GaN at 98.5% efficiency.
(2) Market estimates for 2030, based on DNV and Navitas analysis

"Living Well, Off-the-Grid"

Llew Vaughan-Edmunds
Sr. Director

Navitas

Energy • Efficiency • Sustainability

Contact: ir@navitassemi.com
Note disclaimers.