



“Electrify Our World™”



Gene Sheridan
CEO, Co-founder

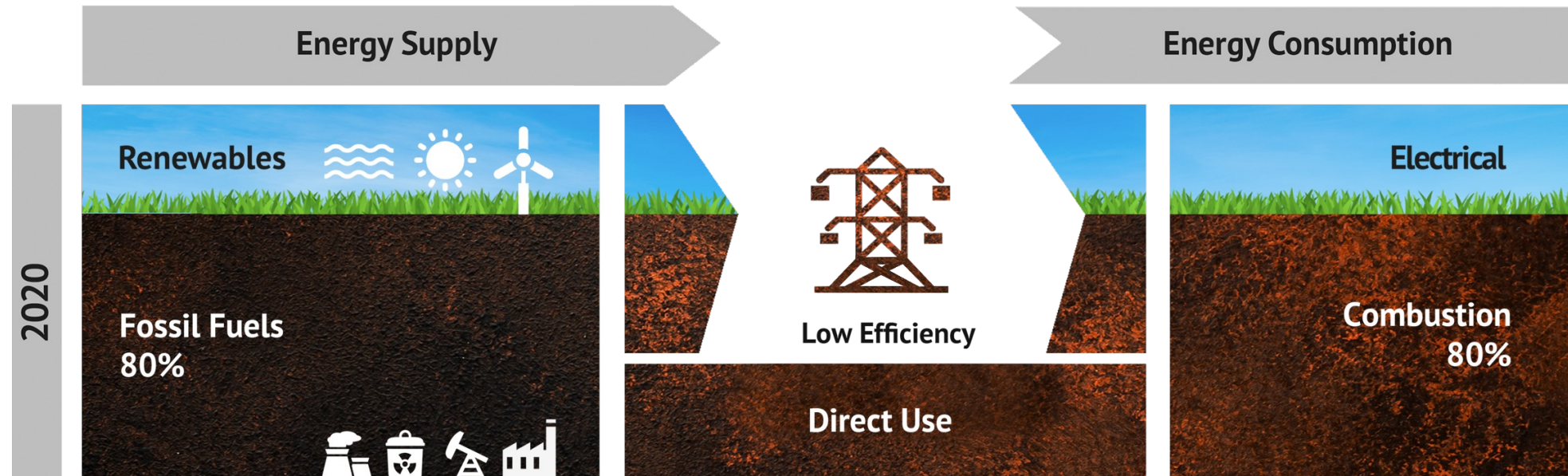


Navitas

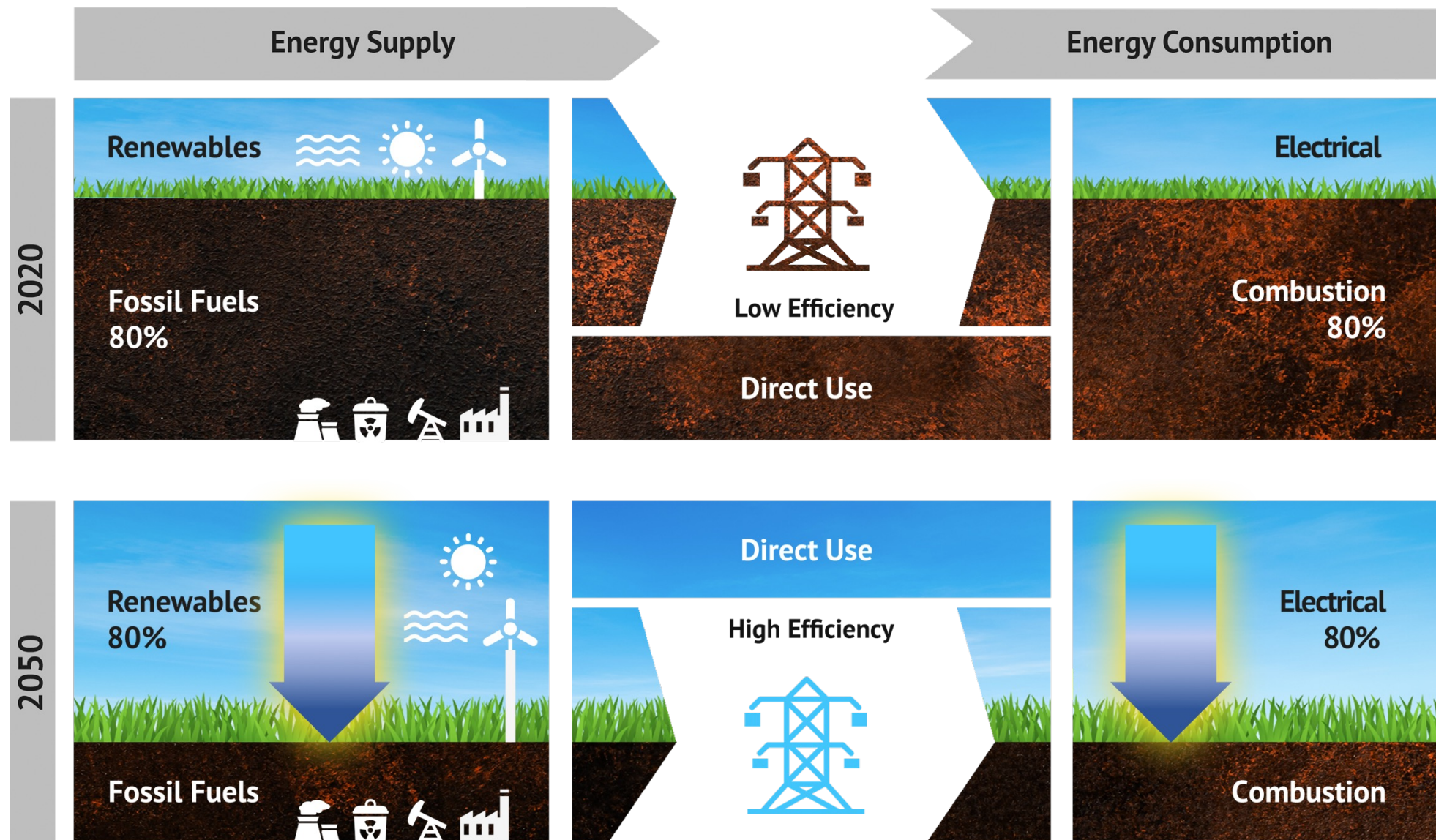
Energy • Efficiency • Sustainability



The 80% Fossil Fuel Challenge



The 80% Electrical Solution



Legislation Catching Up



1992 Voluntary. 3x reduction in refrigerator energy use since 1980



2004 Voluntary. ~60% energy savings for server AC-DC.



2023 Compulsory. 'Titanium plus' (>96%) data center power



2022 Compulsory. 50 California cities banned gas stoves in new buildings.

2030 Compulsory. No natural gas-powered furnaces and heaters

2035 Compulsory. No gas-powered "small off-road engines"

2035 Compulsory. Advanced Clean Cars II – 100% zero-emission sales

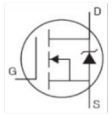


Critical Upgrades in Power Semiconductors



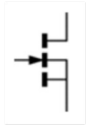
Note: Navitas estimate of GaN- & SiC-based power systems compared to silicon in the 2024-2025 timeframe.

Silicon FET



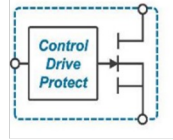
- Old, slow
- High Q_g
- High C_{oss}
- $F_{sw} < 100$ kHz

Discrete GaN



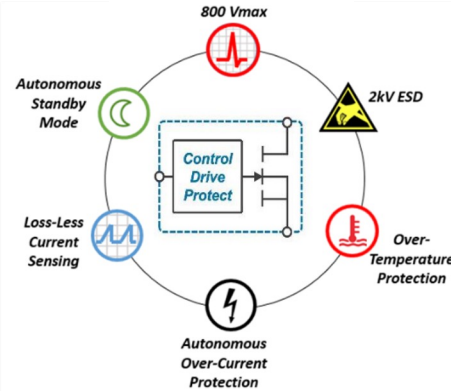
- Exposed gate
- External gate drive
- dV/dt sensitivity
- Layout sensitivity
- ESD sensitivity
- Unknown reliability
- Unknown robustness

GaNFast™ 200-300 kHz



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

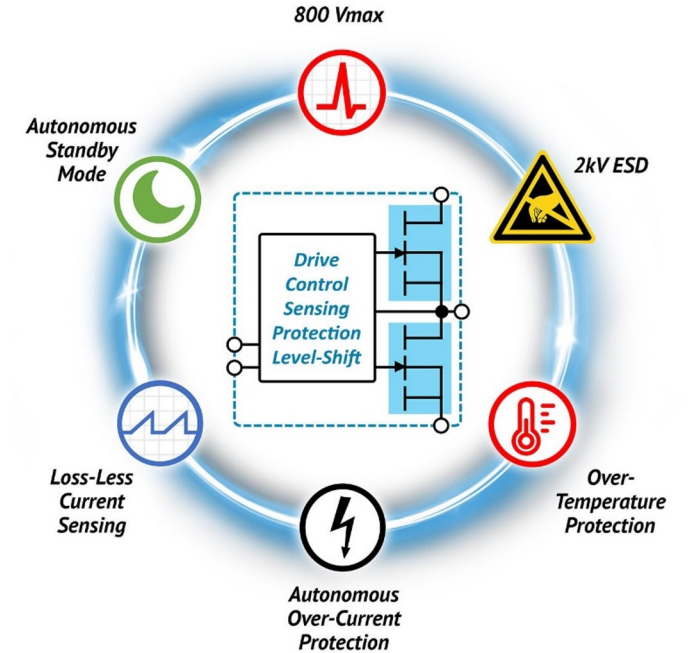
GaNSense™ 500 kHz



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



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)

100%-Tested Robust Avalanche

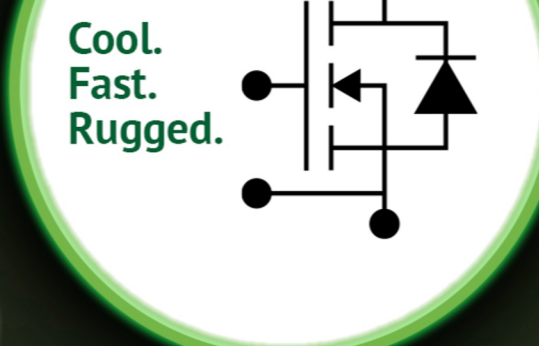
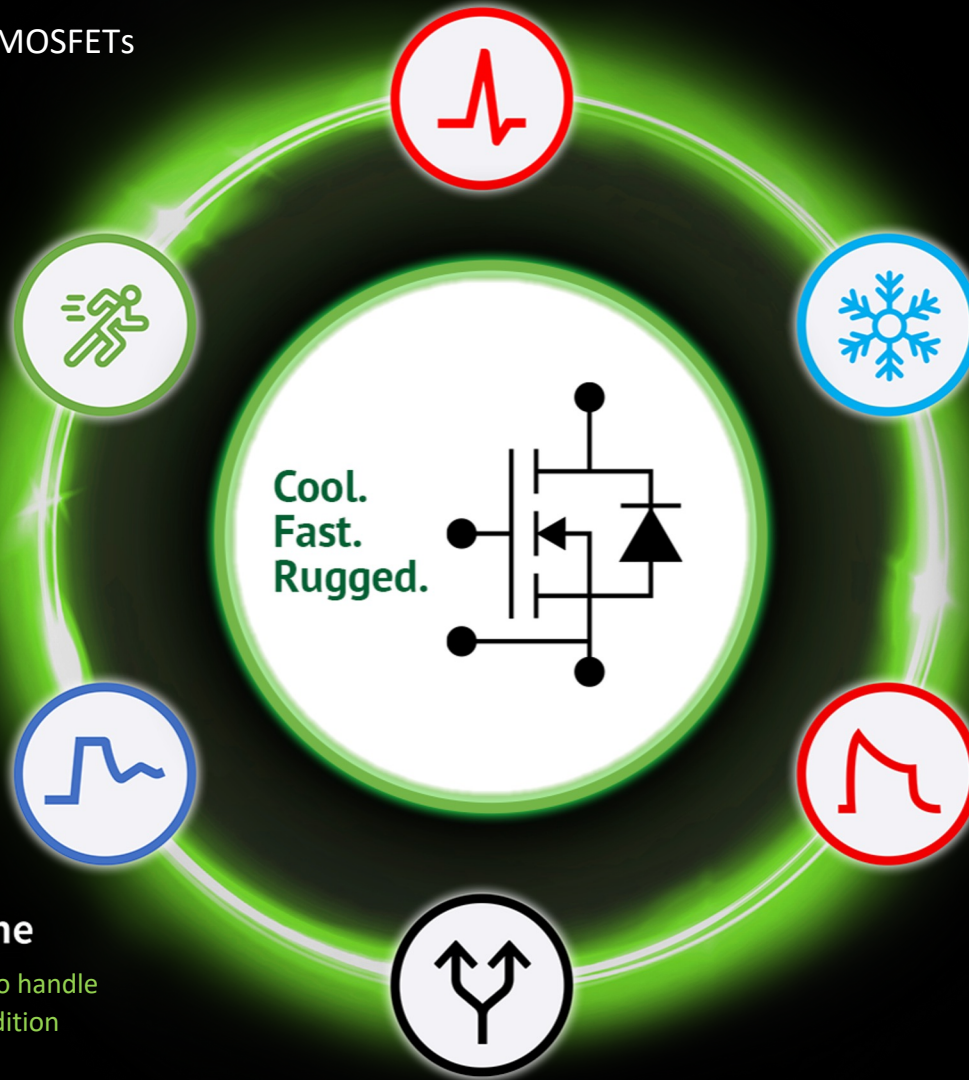
Highest published capability to handle excess energy in fault condition

Long Short-Circuit Withstand Time

World-class survival duration in fault condition

High-Power Paralleling

Matching currents
(Stable V_{TH})



Cool.
Fast.
Rugged.



Electrify Our World™

From:

- 20 W** Mobile fast-chargers, and
- 20 kW** EV on-board chargers, to
- 20 MW** Grid-tied systems

Navitas GaNFast power ICs and GeneSiC power FETs and diodes drive efficiency, power density and lower system costs

Faster Acceleration Longer Range More Power Faster Charging



Smaller Lighter Higher Density Higher Efficiency

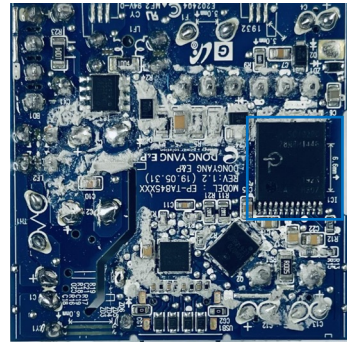


True GaN Integration Drives Speed, Size

GaN MCM
45W



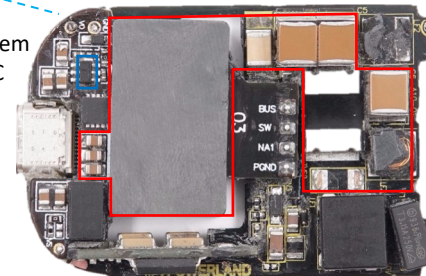
Passive Components



GaN Discrete in Multi-Chip-Module (MCM)

Speed Shrinks Passives

System IC



Passive Components

GaN ICs
50W



System IC

GaN ICs

65 kHz
Bobbin Transformer (23 mm thick)
Electrolytic Capacitors
52 x 53.1 x 30.1 mm = 83 cc Case + pins
0.5 W/cc



6x Faster

3x Smaller

400 kHz
Planar Transformer (8 mm thin)
No Electrolytic Caps
82.2 x 39.0 x 10.5 mm = 34 cc Case
1.5 W/cc

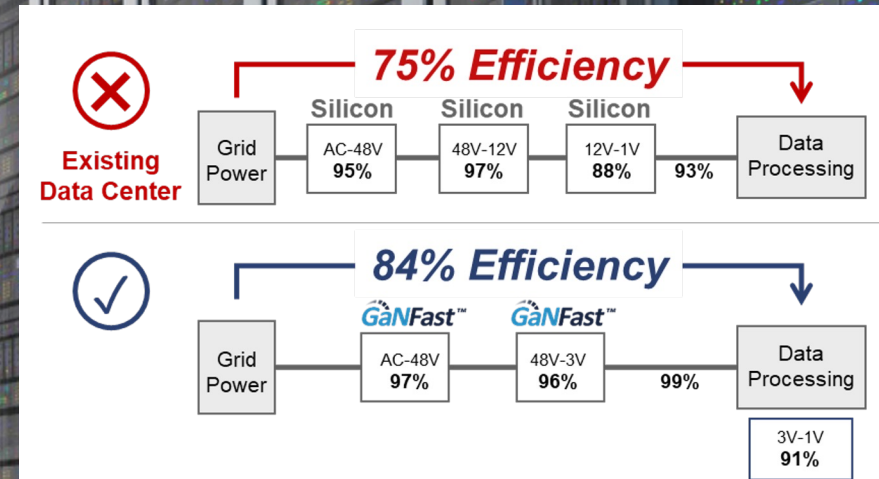
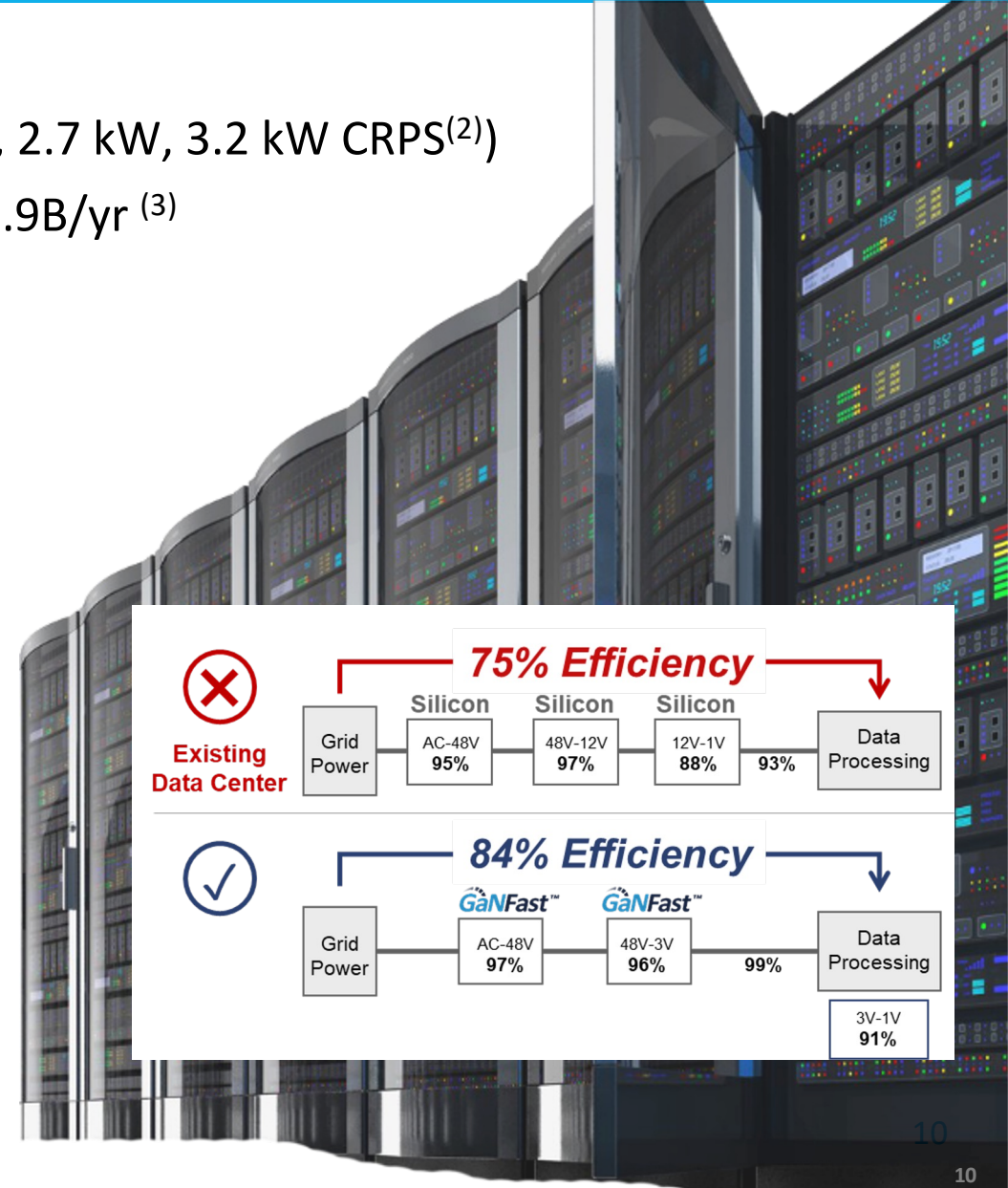
GaNFast Exceeds “Titanium” with >2x Power Density

- Euro ‘Titanium plus’ standard from January 1st, 2023⁽¹⁾
- Design Center: 4 platforms, 8 customer projects (1.3 kW, 1.6 kW, 2.7 kW, 3.2 kW CRPS⁽²⁾)
- GaN can reduce electricity use by up to 10%, save >15 TWh or \$1.9B/yr ⁽³⁾

Slow Silicon AC-DC 3,200W	GaNFast AC-DC 2,700W
 <p>47 kHz 325 x 107 x 41 mm 2.2 W/cc</p>	 <p>300-500 kHz 185 x 73.5 x 39 mm 5.1 W/cc</p> <ul style="list-style-type: none"> • >2x higher power density • >30% reduction in energy loss

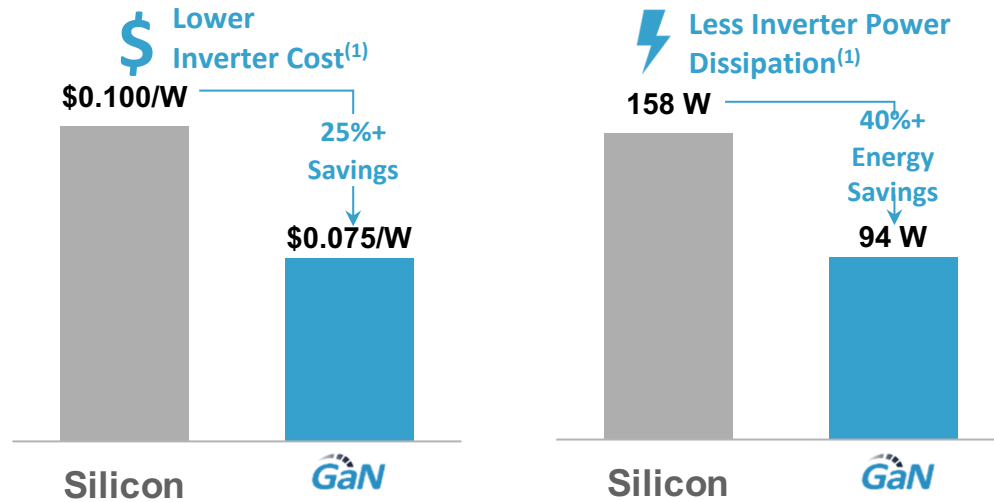
“GaN is a breakthrough new technology that is enabling dramatic reductions in size, energy savings and power density”
“Navitas is an excellent partner with industry-leading GaN ICs”

Robin Cheng, VP R&D

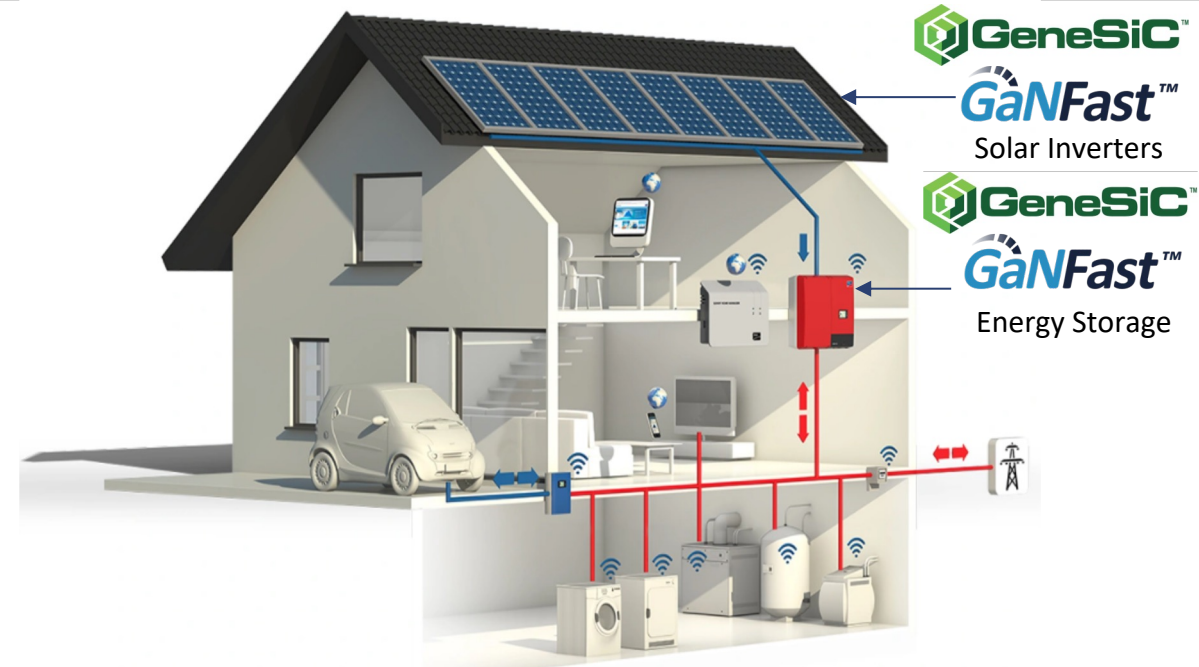


(1) European Union ‘Directive 2009/125/EC, 2019 Annex’, power supplies must be >96% efficiency peak.
 (2) CRPS = Common Redundant Power Supply standard, defined by Intel for standardized mechanical form-factors, targets hyper-converged compute, storage and networking eqpt.
 (3) Navitas est. based on a) Navitas server/datacom forecast & AAAS data, b) \$0.12/kWhr, c) Si vs. GaN \$/W and d) data-center loading profile. Estimated based on known existing Si-based solutions to deliver >500A next-generation data processors to Navitas targets for new GaN-based AC/DC and DC/DC for these same next-generation data processors
 © Navitas Semiconductor 2023

GaN + SiC for Solar & Energy Storage



(1) EnergySage Solar Marketplace, 2020.



Synergistic & Engaged Customers

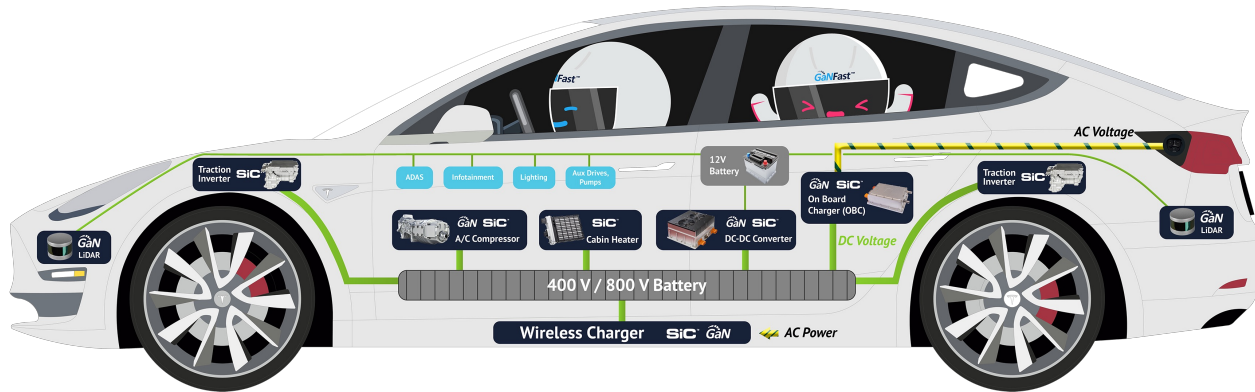


Market Potential for GaN/SiC⁽²⁾

- 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

Dedicated EV System Design Center



- 4 platforms in development, for 8 customer projects
- 400V 6.6 kW bi-directional charger (2-in-1)
 - 800V 6.6 kW bi-directional charger and DC-DC (3-in-1)
 - 22 kW wall charger (400V and 800V versions)

\$12B/yr Potential for GaN/SiC by 2030⁽¹⁾

OBC > \$38

DC-DC > \$12

Traction drive > \$286

• **Total:** > \$330 per EV = \$10.1B

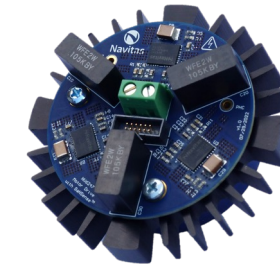
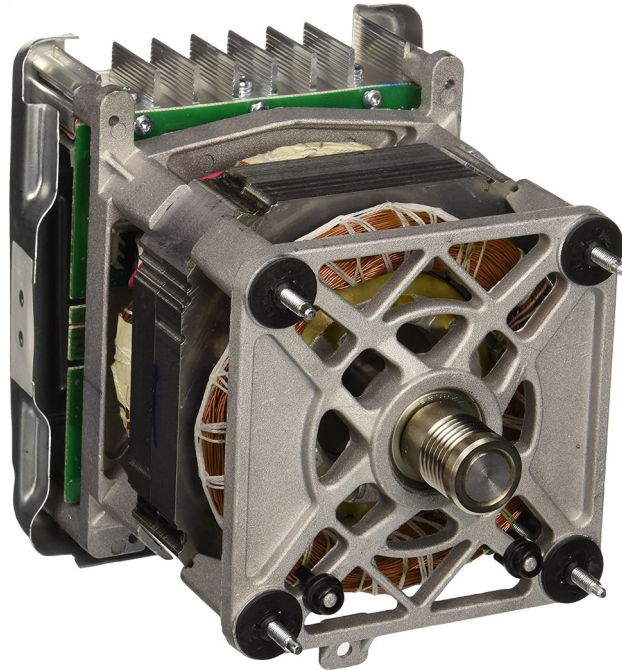
...and > \$1.9B in road-side chargers

Synergistic & Engaged Customers



90% Energy Saving vs. AC Motors

Legacy Si-Based Brush-less DC (BLDC)
Motor & Inverter for Washing Machine
(~80% efficiency)



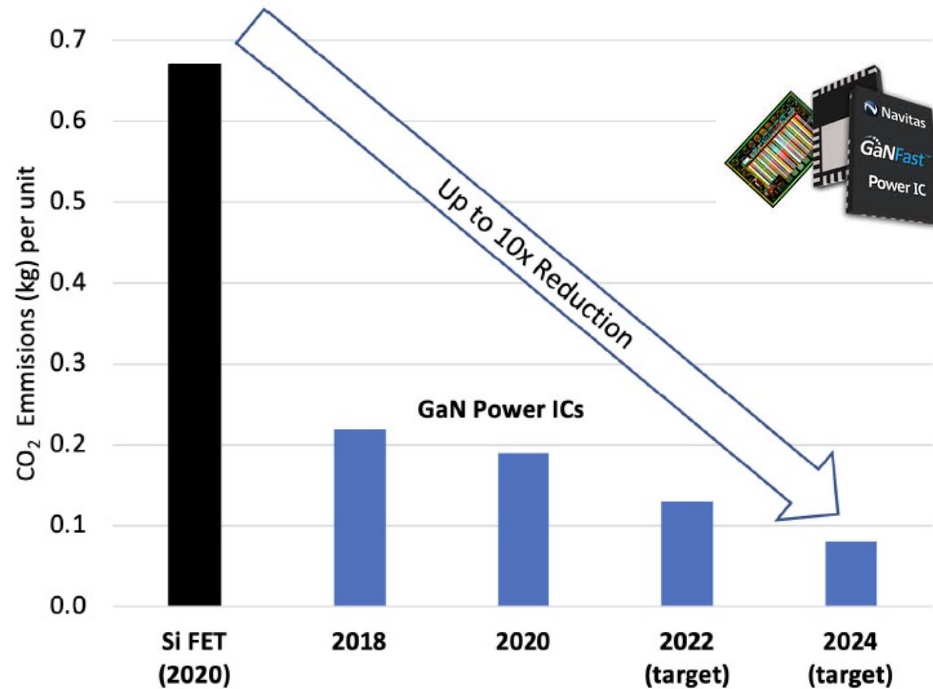
GaN-Based 300W 3-phase Platform
for Inverter-Motor Integration

- 2x higher frequency
- >60% fewer components, PCB area
- 95-97% efficiency
- 80% energy savings vs Silicon BLDC
- 90% energy savings vs AC motors
- High reliability
- Fast time to market
- 50-300W Motors = \$1.5B/yr GaN Opportunity⁽¹⁾

(1) Navitas estimate 50-300W motors, including circulators, hydronic pumps, aircon IDU/ODU fans, HVAC, air purifiers, hair dryers, refrigerator compressors, dishwashers, washing machines.

10x Smaller Device, 30% Smaller Application Footprints

GaN ICs: significant reductions in device carbon footprint



Enable significant reductions in application size, CO₂ footprint



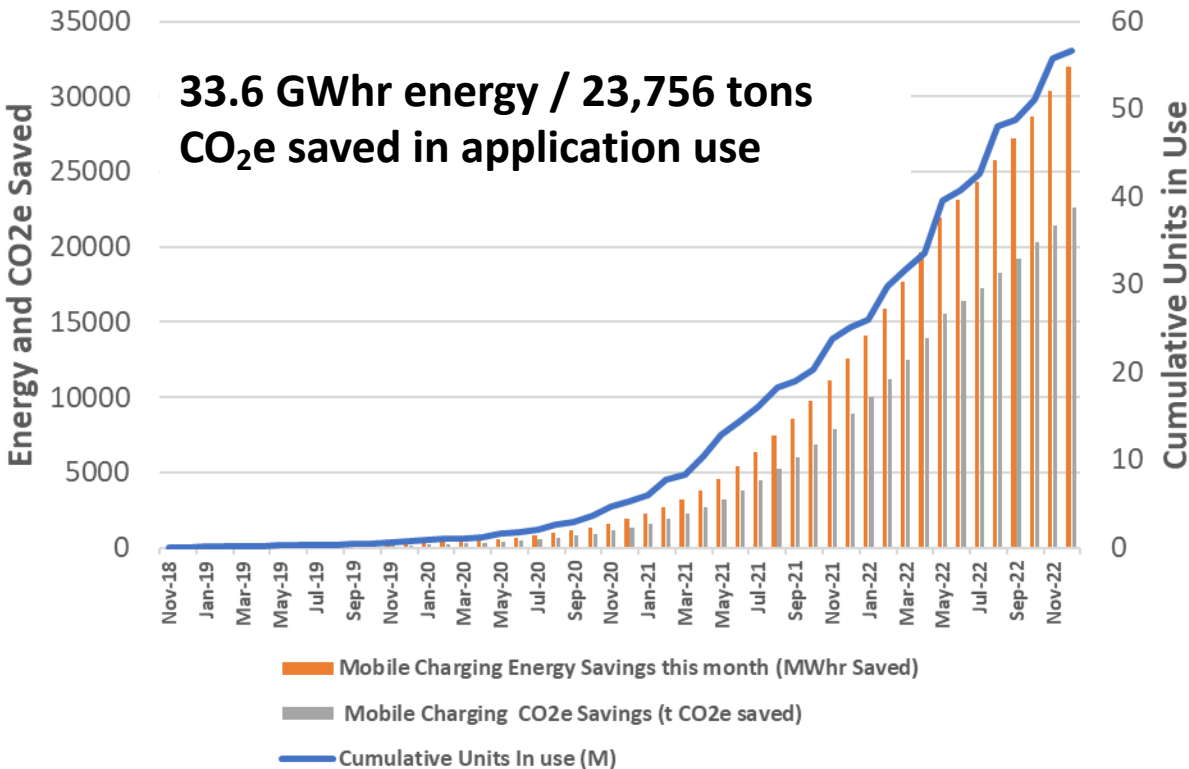
Dematerialization, increased efficiency

Third-party life-cycle analysis (LCA): ISO14040/44-compliant

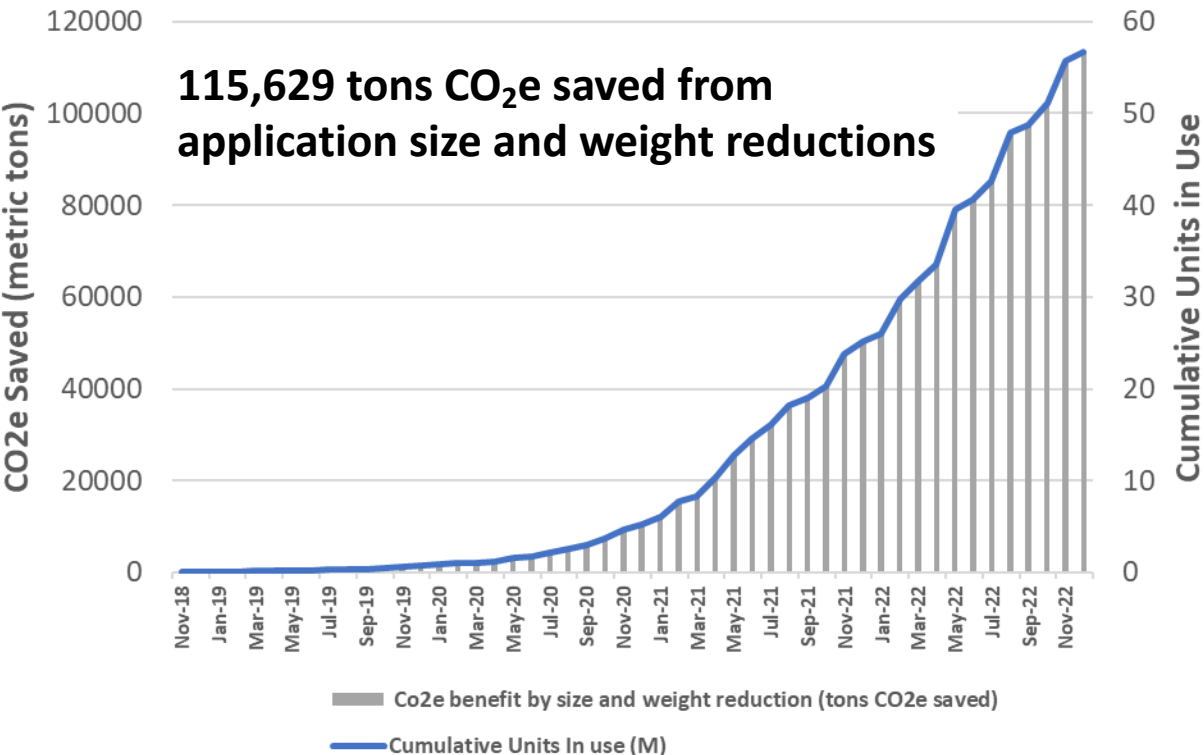
Sustainability Benefits of GaNFast ICs



Navitas Energy Savings Benefits



Navitas Dematerialization Benefits



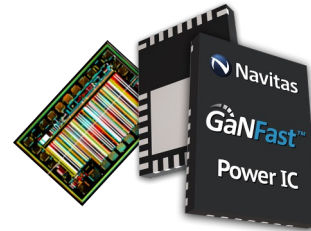
Navitas saved almost 140,000 metric tons CO₂e to date

Leader in Sustainability



Every **GaNFast™ IC** saves⁽³⁾

4 kg CO₂



4x-10x lower component CO₂ footprint than silicon⁽¹⁾

28% lower lifetime CO₂ footprint for chargers / adapters⁽²⁾

Accelerates transition from ICE to EV by **3 years**, saving **20%/yr** of road-sector emissions by 2050 ⁽³⁾

GaN saves up to **2.6 Gton / year** by 2050⁽⁴⁾
SiC saves up to **3.4 Gton / year** by 2050⁽⁵⁾

February '22 First GaN sustainability report based on global standards.



May '22 World's first semiconductor company CarbonNeutral® certified



August '22 First 100,000 tons CO₂ saved



October '22 Recognized for industry-leading sustainability reporting

(1) Earth-Shift Global LCA, Navitas data. (1) Earth-Shift LCA. (3) DNV assessment based on LCA, Navitas data. (4,5) Navitas estimate based on DNV data, Yole projections, Navitas system estimates.

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