

9. Acronyms and Abbreviations

°C	Degrees Celsius
µm	Micron
0-D	Zero-dimensional
1-D	One-dimensional
2-D	Two-dimensional
3-D	Three-dimensional
3G	Third generation
3PL	Third-party logistics
4G	Fourth generation
A/F	Air/fuel
AC	Alternating current
ACE	Advanced Combustion Engines
ACEC	Advanced Combustion and Emissions Control
ACEEE	America Council for an Energy-Efficient Economy
ACM	American Center for Mobility
ACMZ	Aluminum-copper-manganese-zirconium
ACT	Applications and Collaboration Tool
ACT	Appalachian Clean Transportation
AD	Additive manufacturing
ADAS	Advanced driver-assisted system
ADOPT	Automotive Deployment Options Projection Tool
AEC	Advanced Engine Combustion
AEO	Annual Energy Outlook
AFA	Alumina-forming austenitic
AFC	Alternative Fuel Corridor
AFLEET	Alternative Fuel Life-Cycle Environmental and Economic Transportation
AFRL	Air Force Research Laboratory
AFV	Alternative fueled vehicle
Ag	Silver
AI	Artificial intelligence

AIMD	ab initio molecular dynamics
AIMSUN	Advanced Interactive Microscopic Simulator for Urban and Non-Urban Networks
Al	Aluminum
Al ₂ O ₃	Aluminum oxide (alumina)
ALD	Atomic layer deposition
AM	Active material
AM	Additive manufacturing
AMAT	Applied Materials
AMBER	Advanced Model Based Engineering Resource
AMIPC	Advanced Materials Intelligent Processing Center
AMO	Advanced Manufacturing Office
AMOX	Ammonia oxidation
AMP	Assured Micropatching Program
AMR	Annual Merit Review
ANL	Argonne National Laboratory
API	Application performance interface
APS	Advanced Photon Source
APT	Atomic probe tomography
APTA	American Public Transportation Association
ARL	U.S. Army Research Laboratory
ARPA-E	Advanced Research Projects Agency-Energy
ASC	Ammonia slip catalyst
ASR	Area-specific resistance
ASSB	All-solid-state-battery
ASTM	American Society for Testing and Materials
ATCS	Adaptive traffic control system
ATRI	American Transportation Research Institute
AV	Autonomous vehicle
B	Boron
BaTiO ₃	Barium titanate
BCC	Body-centered cubic
BEA	Zeolite beta

BEAM	Behavior, Energy, Autonomy, and Mobility
BEAM CORE	Behavior, Energy, Autonomy, and Mobility Comprehensive Regional Evaluator
BES	Basic Energy Sciences
BETO	Bioenergy Technologies Office
BEV	Battery electric vehicle
BG&E	Baltimore Gas & Electric
BMS	Battery management system
BN	Butyronitrile
BNL	Brookhaven National Laboratory
BOTTLE™	Bio-Optimized Technologies to keep Thermoplastics out of Landfills and the Environment
BP	Budget Period
BR	Battery Resourcers
BTE	Brake thermal efficiency
BTMS	Behind-the-meter storage
BTO	Building Technologies Office
BTS	Bureau of Transportation Statistics
BY	Budget year
BYU	Brigham Young University
C	Charge rate
C	Carbon
CA10	Crank angle at 10% mass fraction burned
CAD	Computer-aided design
CAFE	Corporate Average Fuel Economy
CALPHAD	CALculation of PHAase Diagram
CAMP	Cell Analysis, Modeling, and Prototyping
CARLA	Computer-Assisted Related Language Adaptation
CARTS	Capital Area Rural Transportation System
CAV	Connected and automated vehicle
CAVE	Connected and Automated Vehicle Environment
CB	Carbon black
cc	Close coupled

CCD	Critical current density
CCS1	Combined Charging System
CCT	Continuous cooling transformation
CCV	Cycle-to-cycle variation
CDOT	Chicago Department of Transportation
CDOT	Colorado Department of Transportation
Ce	Cerium
CE	Coulombic efficiency
Ce	Cerium
CEC	California Energy Commission
CEI	Cathode-electrolyte interface
CEM	Composite epoxy material
CEO	Colorado Energy Office
CF	Carbon fiber
CFD	Computational fluid dynamics
CFM	Complex framework materials
CFR	Cooperative fuel research engine
CFRC	Carbon fiber reinforced composite
CFRP	Carbon fiber reinforced polymer
CFTF	Carbon Fiber Technology Facility
CGS	Compressed gas storage
CH ₄	Methane
CHA	Chabazite
CHT	Conjugate heat transfer
CI	Compression-ignition
CIERA	Cavitation-induced erosion risk assessment
CLEERS	Crosscut Lean Exhaust Emissions Reduction Simulations
cm	Centimeter
CMU	Carnegie Mellon University
CNC	Computer numerical control
CNF	Carbon nanofiber
CNG	Compressed natural gas

CNMS	Center for Nanophase Materials Sciences
CNT	Carbon nanotube
CO	Carbon monoxide
Co	Cobalt
CO ₂	Carbon dioxide
CORE	Comprehensive Regional Evaluator
COTS	Commercial-off-the-shelf
COVID-19	Coronavirus disease 2019
CPUC	California Public Utilities Commission
CR	Compression ratio
Cr	Chromium
CRADA	Cooperative research and development agreement
CS	Cold start
CS	Cooled spray
CSRL	Cybersecurity Research Laboratory
CT	Computerized tomography
CTA	Chicago Transit Authority
Cu	Copper
CUC	Clean up catalyst
CV	Cyclic voltammetry
CV	Connected vehicle
CV	Commercial vehicle
C-V2X	Cellular vehicle-to-everything
CVVD	Continuously variable valve duration
CVVT	Continuous variable valve technology
CYC	Columbus Yellow Cab
DARPA	Defense Advanced Projects Research Agency
DC	Direct current
DCFC	Direct-current fast charger
DCIR	Direct current internal resistance
DCRNN	Diffusion Convolutional Recurrent Neural Network
DER	Distributed energy resources

DFI	Ducted fuel injection
DFP	Diesel particulate filter
DFT	Density function theory
DHS	U.S. Department of Homeland Security
DI	Direct injection
DIC	Digital image correlation
DICTRA	Diffusion-Controlled TRAnsfOrmations in multi-component systems, a software diffusion module within Thermo-Calc for accurate simulation of diffusion-controlled reactions in multi-component alloy systems
DIW	Direct ink writing
DMBQ	Dimethoxy benzoquinone
DMTV	Discharge molecular tagging velocimetry
DMV	Department of Motor Vehicles
DNN	Deep neural network
DNS	Direct numerical simulation
DOC	Diesel oxidation catalyst
DOC-F	Combined diesel oxidation catalyst and diesel particulate filter
DOE	U.S. Department of Energy
DOL	Dioxolane
DOT	[state or city] Department of Transportation
DOT	U.S. Department of Transportation
DPF	Diesel particulate filter
DRX	Cation-disordered rock salt
DSRC	Dedicated short-range communication
DTNA	Daimler Trucks North America
Dy	Dysprosium
e	Electric
E10	10% ethanol, 90% gasoline blend
E _a	Activation energy
EAM	Electrochemically active mono-layers
EAT	Exhaust aftertreatment
EBSD	Electron backscatter diffraction

EC	Ethylene carbonate
ECFM	Extended coherent flame model
ECN	Engine Combustion Network
EcoCAR	EcoCAR Mobility Challenge Advanced Vehicle Technology Competition
EDT	Electric Drive Technology(ies)
EEMS	Energy Efficient Mobility Systems program
EERE	Office of Energy Efficiency and Renewable Energy
EERE	Office of Energy Efficiency and Renewable Energy
EETT	Electrical and Electronics Technical Team
EGR	Exhaust gas recirculation
EHC	Electrically heated catalyst
EHN	Ethylhexyl nitrate
ELSA	Euler-Lagrange spray atomization
EM	Electromagnetic
EMC	Ethyl methyl carbonate
EMI	Electromagnetic interference
EMSL	Environmental Molecular Sciences Laboratory
EOL	End of life
EPA	U.S. Environmental Protection Agency
EPR	Electron paramagnetic resonance spectroscopy
EPRI	Electric Power Research Institute
ES	Energy storage
ESB	Electric school bus
EV	Electric vehicle
EVI-Pro	Electric Vehicle Infrastructure Projection tool
EVSE	Electric vehicle supply equipment
FAA	Federal Aviation Administration
FASTSim	Future Automotive Systems Technology Simulator
FCA	Fiat Chrysler Automobiles
FCC	Federal Communications Commission
FCE	First-cycle efficiency
FCEV	Fuel-cell electric vehicle

FCTO	Fuel Cell Technologies Office
FD	Fundamental diagram
Fe	Iron
Fe ₄ N	Iron nitride
FEA	Finite element analysis
FEC	Fluoroethylene carbonate
FEM	Finite element method
FFRDC	Federally Funded Research and Development Center
FIF	Fundamental Influencing Factor
FLM	First/last mile
FMLM	First-mile and last-mile
FSLW	Friction-stir linear welding
FSP	Flame Spray Pyrolysis
FSP	Friction-stir processing
F-SPR	Friction self-piercing rivet
FSW	Friction-stir weld(ing)
FT	Fuel and Lubrication Technologies
FTE	Freight-ton efficiency
FTIR	Fourier-transform infrared spectroscopy
FTP	Federal Test Procedure
FY	Fiscal Year
g	Gram
g/hp-hr	Gram per horsepower-hour
GaN	Gallium nitride
GBL	gamma butyrolactone
GCI	Gasoline compression ignition
GDI	Gasoline direct injection
GED	Gravimetric energy density
GEM	Greenhouse gas Emissions Model
Gen	Generation
Georgia Tech	Georgia Institute of Technology
GF	Glass fiber

GHG	Greenhouse gas
GHSV	Gas hourly space velocity
GM	General Motors
GPCF	Gallon per cubic foot
GPF	Gasoline particulate filter
GPR	Gaussian process regression
GPS	Global positioning system
GREET	Greenhouse gases, Regulated Emissions, and Energy use in Transportation model
GSE	Glassy solid electrolyte
GTI	Gas Technology Institute
GVSC	Ground Vehicles Systems Center
GVWR	Gross vehicle weight rating
H	Hydrogen
H ₂	Hydrogen
H ₂ O	Water
HAPCAP	Hocking-Athens-Perry Community Action
HC	Hydrocarbon
HCE	High-consequence events
HCT	Hydrocarbon trap
HD	Heavy-duty
HDV	Heavy-duty vehicle
HE	High energy
HFET	Highway Fuel Economy Test
HFR	High-rate friction rivet
HFS	High fuel stratification
HFTO	Hydrogen and Fuel Cell Technologies Office
HIL	Hardware-in-the-loop
HIP	Hot isostatic pressing
HOPG	Highly oriented pyrolytic graphite
HPC	High-performance computing
HPDC	High-pressure die casting
HPPC	Hybrid pulse power characterization

HPSC	High-performance scientific computing
HQ	Headquarters
HRE	Heavy rare earth
HT	High temperature
HTA	Hydrothermally aged
HTC	High-temperature carbonization
HVAC	Heating, ventilation, and air conditioning
HVM	High volume manufacturing
HVR	High-velocity rivet
IACMI	Institute for Advanced Composites Manufacturing Innovation
IC	Internal combustion
ICE	Internal combustion engine
ICEV	Internal combustion engine vehicle
ICME	Integrated computational materials engineering
ID	Identification
IDS	Intrusion detection system
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IIT	Illinois Institute of Technology
IL	Ionic liquid
ILSS	Interlaminar shear strength
In	Indium
INEXUS	Individual Experienced Utility-based Synthesis
INL	Idaho National Laboratory
IP	Intellectual property
IRB	Institutional Review Board
ISO	International Organization for Standardization
ITE	Indicated thermal efficiency
ITS	Intelligent Transportation Systems
IUPUI	Indiana University – Purdue University Indianapolis
IZ	Isoxazol
JCP	Joining Core Program

JRC	Joint Research Center
kg	Kilogram
KIT	Karlsruhe Institute of Technology
k_p	Parabolic rate constant
kPa	Kilopascal
KPI	Key performance indicator
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-hour
kWh/lb	Kilowatt-hour/pound
L	Liter
L	Level
lb	Pound
LBNL	Lawrence Berkeley National Laboratory
LBS	Location-based service
LCA	Life-cycle analysis
LCC	Inductor-capacitor-capacitor
LCO	Lithium cobalt oxide
LCOD	Levelized cost of driving
LD	Light-duty
LDV	Light-duty vehicle
LES	Large eddy simulation
LFP	Lithium iron phosphate
LHCE	Localized high-concentration electrolyte
Li	Lithium
$\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$	Lithium lanthanum zirconium oxide
LIB	Lithium-ion battery
LIBRA	Lithium Ion Battery Resource Assessment
LIC	Lithium-ion conducting
LIDAR	Light detection and ranging
LiF	Lithium fluoride
LiFSI	Lithium bis(fluorosulfonyl)imide

LIG	Laser-induced graphene
LightMAT	Lightweight Materials Consortium
LiNO ₃	Lithium nitrate
Li-SIA	Lithium structurally isomorphic alloys
LLNL	Lawrence Livermore National Laboratory
LLZO	Lithium lanthanum zirconium oxide
LMNO	Lithium manganese nickel oxide
LMO	Lithium manganese oxide
LNMC	Lithium nickel manganese cobalt oxide
LNMO	Lithium nickel manganese oxide
LNO	Lithium-nickel dioxide (LiNiO ₂)
LOE	Level of effort
LoOP	Local outlier probability
LPBF	Laser powder bed fusion
LPF	Lithium plating free
LPG	Liquified petroleum gas
LPS	Sulfide-based solid state electrolyte, Li ₃ PS ₄
LPSCI	Halogenated sulfide-based solid state electrolyte
LSEV	Low-speed electric vehicle
LSPI	Low-speed pre-ignition
LT	Low-temperature
LTAT	Low-temperature aftertreatment
LTC	Low-temperature combustion
LTO	Lithium titanate (Li ₄ Ti ₅ O ₁₂)
LVF	Liquid volume fraction
M	Molar
m	Meter
M/O	Metal and oxide
MA3T	Market Acceptance of Advanced Automotive Technologies model
mAh	Milliamp-hour
MAS	Micro-alloyed steel
MAT	Materials Technology Program

MCCI	Mixing-controlled compression ignition
MCE	Multi-cylinder engine
MD	Medium-duty
MD	Molecular dynamics
MDF	Manufacturing Demonstration Facility
MDV	Medium-duty vehicle
MEP	Mobility Energy Productivity
MER	Molar expansion ratio
MERF	Materials Engineering Research Facility
MFA	Multi-factor authentication
MFI	Materials Flow through Industry
mg	Milligram
Mg	Magnesium
MIB	Management Information Base
MIC	Molecular ionic composite
Michigan Tech	Michigan Technological University
min	Minute(s)
Missouri S&T	Missouri University of Science and Technology
MIT	Massachusetts Institute of Technology
ML	Machine learning
MLPC	Multi-level porous carbon/multi-layer pouch cell
mm	Millimeter
Mn	Manganese
Mn	Manganese
MnCe	Manganese cerium
MOOSE	Multiphysics object oriented simulation environment
MOSFET	Metal-oxide semiconductor field-effect transistor
MOU	Memorandum of Understanding
MPa	Megapascal
MPC	Model predictive control
mph	Miles per hour
MPO	Metropolitan planning organization

MPR	Multi-pressure rail
MS	Mass spectroscopy
MSU	Michigan State University
MT	MegaTon
MTT	Materials Technical Team
MV	Medium-voltage
MVA	Megavolt-ampere
MW	Microwave
MW	Megawatt
MY	Model Year
N/P	Negative-positive ratio
N ₂ O	Nitrous oxide
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Administration
NASEO	National Association of State Energy Officials
NCA	Nickel cobalt aluminum oxide
NCE	No-cost extension
NCEMC	North Carolina Electric Membership Corporation
NCM	Nickel cobalt manganese oxide
NCSU	North Carolina State University
Nd	Neodymium
NDA	Non-disclosure agreement
NDE	Non-destructive evaluation
NECST	Nanomaterials for Energy Conversion Storage Technology
NETL	National Energy Technology Laboratory
NF	Non-flammable
NG	Natural gas
NGO	Non-governmental organization
NGV	Natural gas vehicle
NHTS	National Highway Travel Survey
NHTSA	National Highway Traffic Safety Administration
Ni	Nickel

NIST	National Institute of Standards and Technology
nm	Nanometer
NM	Non-methane
Nm	Newton-meter
NMC	Nickel manganese cobalt oxide
NMFTA	National Motor Freight Traffic Association
NMHC	Non-methane hydrocarbon
NMP	N-methyl-2-pyrrolidone
NO	Nitric oxide (nitrogen monoxide)
NO ₂	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO _x	Oxides of nitrogen
NPS	National Park Service
NRECA	National Rural Electrification Association
NREL	National Renewable Energy Laboratory
NTC	Negative temperature coefficient
NTCIP	National Transportation Communications for Intelligent Transportation Systems Protocol
NVBL	National Virtual Biotechnology Laboratory
NVH	Noise, vibration, and harshness
NYCC	New York City Cycle
NYPA	New York Port Authority
O	Oxygen
OCPP	Open charge point protocol
ODOT	Ohio Department of Transportation
OE	Office of Electricity
OEM	Original equipment manufacturer
OHC	Oxidation half cycles
OIM	Organic insertion materials
ORNL	Oak Ridge National Laboratory
OSC	Oxygen storage capacity/component
P	Pressure

PACE	Partnership for Advanced Combustion Engines
PAH	Polycyclic aromatic hydrocarbon
PAN	Polyacrylonitrile
PAPSC	Pressure-assisted precision sand casting
PATH	Partners for Advanced Transportation Technology
PBI	Polybenzimidazole
PC	Pre-chamber
PCB	Printed circuit board
PCI	Precision Combustion Inc.
PCP	Peak cylinder pressure
Pd	Palladium
PDF	Pair-distribution function
PDPA	Phase Doppler particle analyzer
PE	Power engineering
PE	Polyethylene
PEEK	Polyetheretherketone
PEG	Polyethylene glycol
PEKK	Polyetherketoneketone
Penn State	Pennsylvania State University
PEO	Polyethylene oxide
PET	Polyethylene terephthalate
PEV	Plug-in electric vehicle
PF	Proportionally fair
PFI	Port fuel injection
PFS	Partial fuel stratification
PGM	Platinum group metals
pH	Power of hydrogen
Ph.D.	Doctor of Philosophy
PHEV	Plug-in hybrid vehicle
PI	Principal Investigator
PII	Personally identifiable information
PIV	Particle image velocimetry

PKI	Public key infrastructure
PM	Particulate matter
PMCP	Powertrain Materials Core Program
PNA	Polynuclear aromatics
PNNL	Pacific Northwest National Laboratory
POLARIS	Planning and Operations Language for Agent-based Regional Integrated Simulation
PP	Polypropylene
ppm	Parts per million
PPS	Passenger protection system
PS	Polysulfide
Pt	Platinum
PTO	Power take-off
PUD	Public utility district
PV	Photovoltaic
PVDF	Polyvinylidene difluoride
PVDF	Polyvinylidene fluoride
PZLT	Piezoelectric
Q	Quarter
Q&A	Question and answer
QDTA	Quasi-dynamic traffic assignment
R&D	Research and development
R2R	Roll to roll
RANS	Reynolds-averaged Navier-Stokes
RASIC	Responsible, Approving, Supporting, Informed, and Consulted
Rb	Rubidium
RCM	Rapid compression machine
RCT	Charge transfer resistance
RD5-87	Research-grade regular E10 gasoline
RDD&D	Research, development, deployment, and demonstration
RDE	Real Driving Emissions test
RE	Rare earth
ReaxFF	Reactive force field

ReaxFFMD	Reactive force field molecular dynamics
REE	Rare earth element
ReFUEL	Renewable Fuels and Lubricants Laboratory
RE-PM	Rare-earth permanent magnet
RESS	Rechargeable energy storage system
RF	Radiofrequency
RFP	Request for proposal
Rh	Rhodium
RHC	Reduction half cycle
RL	Reinforcement learning
RMP	Rocky Mountain Power
RNN	Recurrent neural networks
ROI	Return on investment
rpm	Revolutions per minute
rpm	Revolutions per minute
RSW	Resistance spot weld
RTM	Resin transfer molding
RTO	Recovery time objective
Ru	Ruthenium
RyThMiCCS	Real-Time Mobility Communications and Control System
S	Flame speed
S	Sulfur
s	Second(s)
S@PAN	Sulfurized polyacrylonitrile
S@PC	Sulfurized porous carbon
SAC	Single-atom catalyst (catalysis)
SAE	Society of Automotive Engineers
SA-LTC	Spark-assisted low-temperature combustion
SBIR	Small Business Innovation Research
SCE	Single-cylinder engine
SCE	Southern California Edison
SCM	Smart charge management

SCR	Selective catalytic reduction
SCRf	Selective catalytic reduction on filter
SEI	Solid-electrolyte interface
SEM	Scanning electron microscopy
SETO	Solar Energy Technologies Office
ShAPE™	Shear Assisted Processing and Extrusion
SHM	Simple harmonic motion
SI	Spark ignition
Si	Silicon
SiC	Silicon carbide
SIL	Software-in-the-loop
SIMS	Secondary Ion Mass Spectrometry
SiO _x	Oxides of silicon
SIS	Safety instrumented system
SLAC	Stanford Linear Accelerator Center
SMART	Systems and Modeling for Accelerated Research in Transportation
SMC	Soft-magnet composite
SN	Succinonitrile
SNAP	Rideshare software interface
S-NIC	Secure network interface card
SNL	Sandia National Laboratories
SNS	Spallation Neutron Source
SOA	State of the art
SOC	State of charge
SOF	System optimal fuel use
SOPO	Statement of project objectives
SOT	System optimal travel time
Spaci-MS	Spatially resolved capillary inlet - mass spectroscopy
SPAN	Sulfurized polyacrylonitrile
SpEC	Smartgrid EV Communication
SPI	Stochastic pre-ignition
SPIN	Smart Power Integrated Node

SPR	Self-piercing rivet
Sr	Strontium
SSB	Solid-state battery
SSE	Solid-state electrolyte
SSL	Self-supervised learning
SST	Solid-state transformer
SStAC	Stainless steel alloy corrosion
STA	Static traffic assignment
STEM	Scanning transmission electron microscopy
SULEV	Super Ultra-Low Emissions Vehicle
SUMO	Simulation of Urban Mobility
SUNY	State University of New York
SURF	Scale-Up Research Facility
SVTRIP	Stochastic vehicle trip prediction
SW	Spray wall
SWI	Spray-wall interaction
SwRI	Southwest Research Institute
t	Time
T	Temperature
TCC-III	Transparent combustion chamber
TCF	Technology Commercialization Fund
TCO	Total cost of ownership
TDOT	Tennessee Department of Transportation
TEA	Techno-economic analysis
TEEM	Transportation Energy Evolution Modeling
TEM	Transmission electron microscopy
TFP	Tailored fiber placement
T _g	Glass transition temperature
Ti	Titanium
TI	Technology Integration
TiAl	Titanium aluminide (gamma titanium)
TMF	Thermochemical fatigue

TMP	Thermo-mechanical processing
TNC	Transportation network company
ToF	Time-of-Flight
TOU	Time of use
TPD	Temperature programmed desorption
TPR	Temperature programmed reduction
TPRF	Toluene primary reference fuel
TRB	Transportation Research Board
TRL	Technology Readiness Level
TTSI	Total Transportation Services Inc.
TuFF	Tailorable universal feedstock for forming
TVR	Taylor Vortex Reactor
TWC	Three-way catalyst
TXM	Transmission X-ray microscopy
U.S.	United States
U.S. DRIVE	United States Driving Research and Innovation for Vehicle efficiency and Energy sustainability
UAM	Urban Air Mobility model
UC Davis	University of California at Davis
UCLA	University of California at Los Angeles
UDF	Undefined user files
UET	User equilibrium travel time
UFPV	Unsteady flamelet progress variable
UH	University of Houston
UIC	University of Illinois at Chicago
UPS	United Parcel Service
URI	University of Rhode Island
USABC	United States Advanced Battery Consortium
USAMP	U.S. Automotive Materials Partnership
USC	University of Southern California
USCAR	United States Council for Automotive Research
USD	Unified School District

USU	Utah State University
USW	Ultrasonic spot welding
UTK	University of Tennessee-Knoxville
UTS	Ultimate tensile strength
UVA	University of Virginia
UW-Madison	University of Wisconsin at Madison
V	Volt
V2G	Vehicle-to-grid
V2I	Vehicle-to-infrastructure
V2V	Vehicle-to-vehicle
V2X	Vehicle-to-anything
VAN	Vehicle Analysis
VGI	Vehicle-grid integration
VIL	Vehicle-in-the-loop
Virginia Tech	Virginia Polytechnic Institute and State University
VIUS	Vehicle Inventory and Use Survey
VMT	Vehicle-miles traveled
VOF	Volume of fluid
VPPG	Virtual physical proving ground
VTO	Vehicle Technologies Office
VTOL	Vertical takeoff and landing
WBG	Wide bandgap
WERC	Wisconsin Engine Research Consultants
Wh	Watt-hour
Wh/kg	Watt-hour per kilogram
WHR	Waste heat recovery
WPI	Worcester Polytechnic Institute
WSR-MZ	Well-stirred reactor multi-zone
wt.%	Weight percent
WU	Waynesburg University
XANES	X-ray absorption near edge structure spectroscopy
XCEL	eXtreme Fast Charge Cell Evaluation of Lithium-ion Batteries

XCT	X-ray Computed Technology
xEV	An electric vehicle, including battery electric vehicle (BEV), hybrid xEV electric vehicle (HEV), plug-in hybrid electric vehicle (PHEV), etc.
XFC	Extreme fast charging
XIL	Anything-in-the-loop
XPS	X-ray photoelectron spectroscopy
XRD	X-ray diffraction
XSS	Cross-site scripting
Y	Yttrium
YS	Yield strength
Zero-RK	Zero-Order Reaction Kinetics
ZEV	Zero-emission vehicle
ZIP	Zone Improvement Plan
Zn	Zinc
ZnO	Zinc oxide
ZNP	Zion National Park
Zr	Zirconium
ZSM-5	Zeolite Sacony Mobil5

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