



CO₂ REGULATORY COMPLIANCE

MARK CHERNOBY | CHIEF TECHNICAL COMPLIANCE OFFICER

CATEGORICAL IMPERATIVE OF AUTOMOTIVE INDUSTRY

WE UNDERSTAND WE ARE PART OF THE PROCESS



BOTH INDUSTRY AND GOVERNMENT HAVE A ROLE

INDUSTRY

TECHNOLOGY TO REDUCE
CO₂ EMISSIONS

MIX OF TECHNOLOGIES TO
COMPLY ACROSS DIVERSE
SET OF REGULATIONS

APPLY MIX TO COMPLY IN AN
ECONOMICALLY SENSIBLE MANNER

EV TECHNOLOGY



mHEV



HEV



PHEV



BEV

GOVERNMENT

ESTABLISH A REGULATORY
FRAMEWORK

SUPPORT DEPLOYMENT
OF INFRASTRUCTURE

HELP DRIVE CONSUMER DEMAND

REGULATION



COMPLIANCE
FRAMEWORK



TRANSPARENCY



RULES



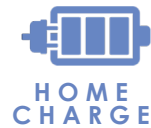
PROCEDURE

CHRYSLER PACIFICA eHYBRID

A TYPICAL DAY IN THE LIFE OF A MINIVAN DRIVER



HOME



DAILY DRIVE



84 MPGe

30+ MILES
ELECTRIC
RANGE

500+ MILES
HYBRID
RANGE



WORK



"SINCE MOST MINIVAN DUTY INVOLVES SHORT HOPS AROUND CITY AND SUBURB, A MINIVAN IS AN IDEAL CANDIDATE FOR HYBRID TECHNOLOGY"



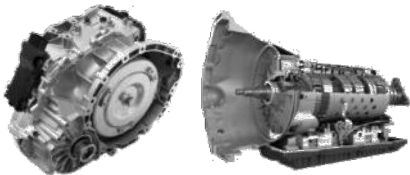
"IT'S JUST A FLAWLESS EXECUTION, AND AN EXAMPLE OF HOW BRIGHT OUR ELECTRIFIED AUTOMOTIVE FUTURE CAN BE"



CO₂ REDUCTION TECHNOLOGIES

IMPLEMENTED TO DATE

TECHNOLOGIES APPLIED SINCE 2014 REDUCED CO₂ BY 15% ACROSS MAJOR PRODUCT INTERVENTIONS



8 AND 9 SPEED
TRANSMISSIONS



AERODYNAMIC
IMPROVEMENTS



ENGINE
STOP START



DOWN-SIZED TURBO
ENGINE FAMILIES



AXLE
DISCONNECT



ACTIVE
GRILLE SHUTTERS



LIGHT
WEIGHTING

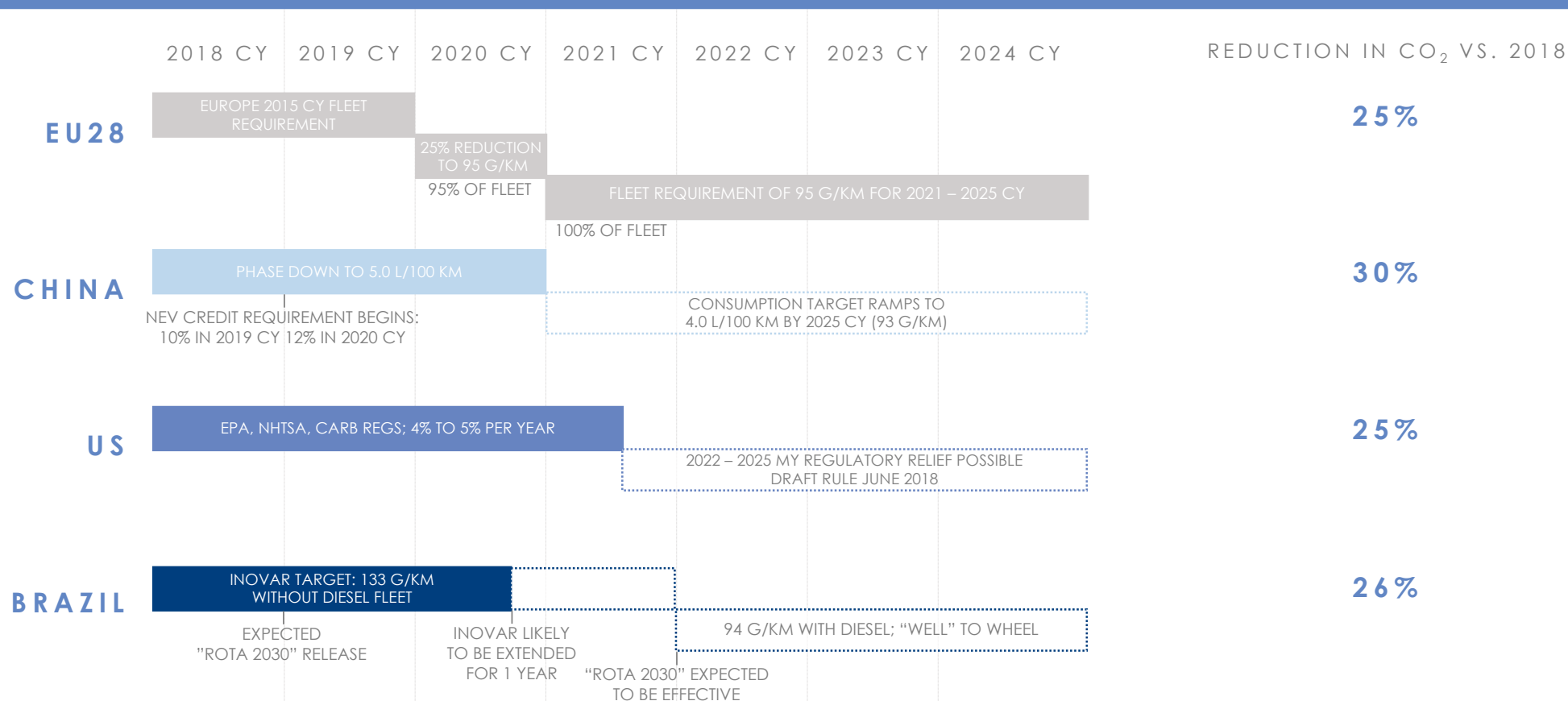


TIRE ROLLING
RESISTANCE

REGULATORY ENVIRONMENT AT A GLANCE

FOUR PRIMARY MARKETS

TEST CYCLES/CALCULATIONS VARY, BUT YIELD SIMILAR OBJECTIVES

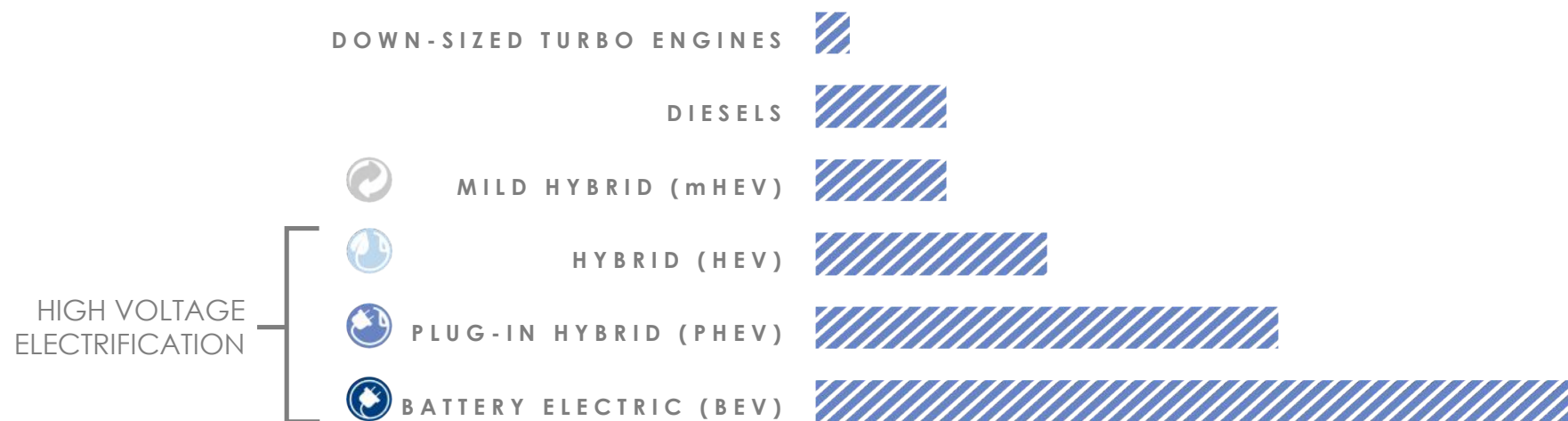


TECHNOLOGY PORTFOLIO

A MIX OF TECHNOLOGIES WILL BE REQUIRED

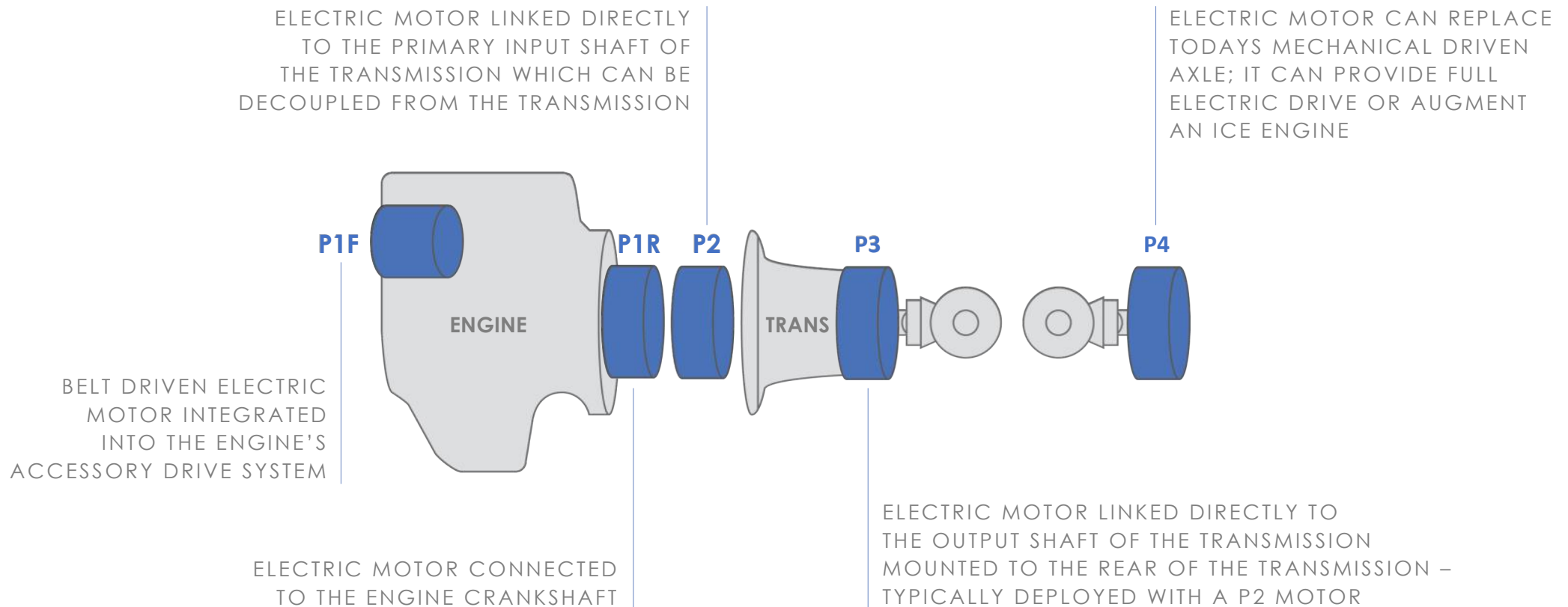
MIX WILL VARY BY MARKET

REDUCTION IN CO₂ VS. TRADITIONAL ICE POWERTRAIN







ELECTRIC PROPULSION DEVICE TERMS

FIVE ELECTRIC MOTOR APPLICATIONS



ELECTRIFICATION SYSTEM DEPLOYMENT

THE EV SYSTEMS ARE DEPLOYED ACROSS GLOBAL VEHICLE ARCHITECTURES

EV SYSTEMS	SMALL	COMPACT/MID	LARGE
 mHEV (3)	P1F 12V BSG FWD		
	P2 48V FWD/RWD		
			P1F 48V BSG RWD/4WD
 HEV (1)			P1P2 RWD/4WD
 PHEV (4)		P1P4 AWD	P1P2 RWD/4WD
		P2P4 PERFORMANCE	P2P3 FWD
 BEV (4)	P4 CITY CAR	P4 MAINSTREAM FWD/AWD	
		P4 PERFORMANCE	P4 PREMIUM

FWD – FRONT WHEEL DRIVE RWD – REAR WHEEL DRIVE AWD – ALL WHEEL DRIVE 4WD – FOUR WHEEL DRIVE

FCA ELECTRIFICATION

THE EV SYSTEMS ENHANCE CORE ATTRIBUTES FOR FCA BRANDS



IMPROVED
FUEL ECONOMY
ACCELERATION
LOW SPEED TORQUE

Jeep®



EMEA REGION CO₂ – 2022

EU28 – MOST CHALLENGING REGULATORY/CONSUMER ENVIRONMENT



REGULATIONS

STEP FUNCTION SHIFT IN 2020

METRO AREAS IMPLEMENTING
LOW/ZERO EMISSION ZONES

FINE AMOUNTS FOR NOT
ACHIEVING CO₂ TARGETS
ARE SIGNIFICANT



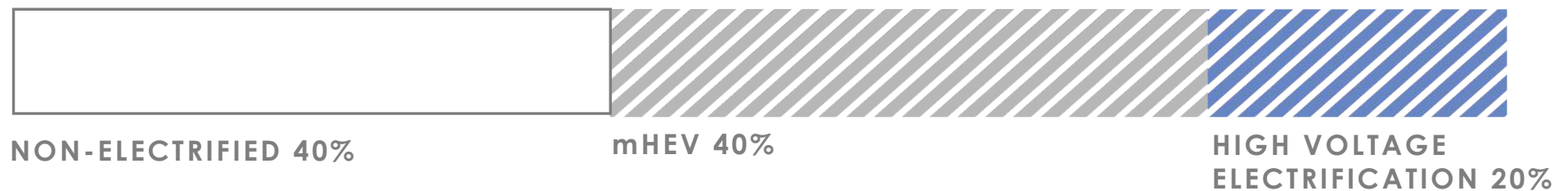
CONSUMERS

CONTINUED NEED FOR LOW
COST OF OWNERSHIP

ELECTRIFICATION REPLACES
DECREASING DIESEL DEMAND

ACCESS TO CHARGING STATIONS
NEEDS DEVELOPMENT

TECHNOLOGY IMPLEMENTATION RATE IN EU28



APAC REGION CO₂ – 2022

CHINA – DRIVING TOWARDS GLOBAL ELECTRIFICATION LEADERSHIP



REGULATIONS

MANDATING NEW
ENERGY VEHICLES (NEV)

NEVs = BEV, PHEV AND
FUEL CELL VEHICLES

CREDIT MULTIPLIERS AND
INCENTIVES FAVOR BEVs

NEV LICENSE PLATE INCENTIVES
ARE SIGNIFICANT



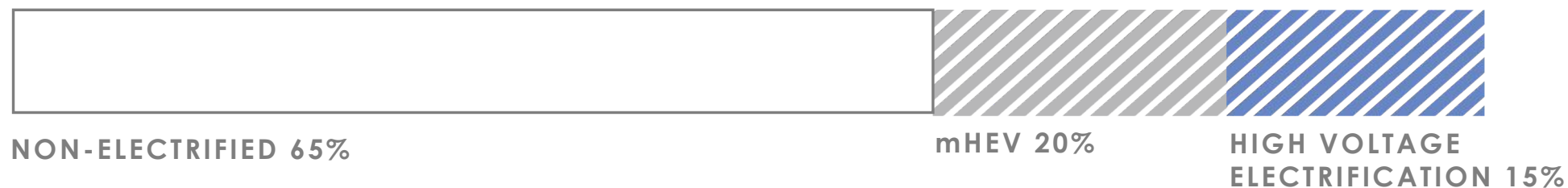
CONSUMERS

EMERGING CONSUMERS/1ST
TIME BUYERS – NEW TO MARKET

DESIRE FOR PERSONAL SPACE
AND ADVANCED TECHNOLOGY

URBAN LIVING, RELIANCE ON
ACCESS TO PUBLIC CHARGING

TECHNOLOGY IMPLEMENTATION RATE IN CHINA



NAFTA REGION CO₂ – 2022

US – REGULATION UNCERTAINTY WITH MID-TERM EVALUATION



REGULATIONS

COMPLEX BUT UNDER
GOVERNMENT REVIEW

3 REGULATIONS – EPA CO₂,
NHTSA CAFE, CARB ZEV

FLEXIBLE REGULATORY STRUCTURE

PLUG-IN TAX CREDIT AVAILABLE
FOR FIRST 200K VEHICLES



CONSUMERS

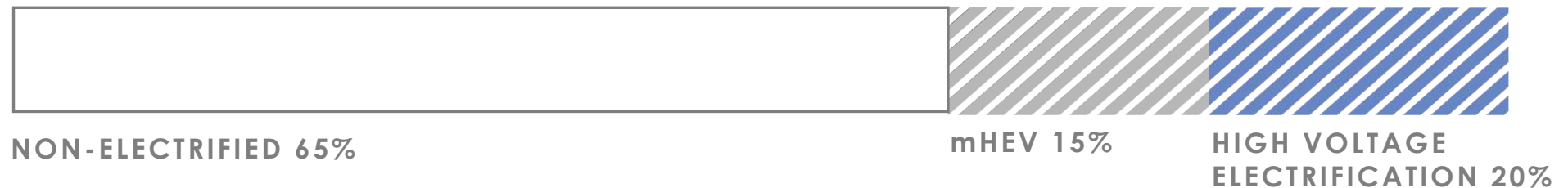
RELATIVELY LOW FUEL PRICES

DEMAND FOR SUVs AND
TRUCKS INCREASING

LONGER COMMUTES AND
TRIPS FAVOR PHEVs

LOW TAKE RATE ON VEHICLES
WITH HIGH VOLTAGE
ELECTRIFICATION IN 2017

TECHNOLOGY IMPLEMENTATION RATE IN US



LATAM REGION CO₂ – 2022

BRAZIL – CO₂ LEVELS ON PAR WORLDWIDE VIA SUGAR CANE ETHANOL USE



REGULATIONS

30% OF VEHICLE FUEL USAGE
IS SUGAR CANE ETHANOL

SUGAR CANE ETHANOL
FUEL IS 80% RENEWABLE

PROPOSED NEXT PHASE
CREDITS ETHANOL FOR ITS
WELL TO WHEEL BENEFITS



CONSUMERS

ETHANOL FUEL READILY AVAILABLE

VERY PRICE SENSITIVE ON
VEHICLE PURCHASES

MOSTLY URBAN DRIVING

PHEV AND BEV FOR
EMERGING ADOPTERS

TECHNOLOGY IMPLEMENTATION RATE IN BRAZIL



NON-ELECTRIFIED AND ETHANOL BASED 99%

HIGH VOLTAGE
ELECTRIFICATION <1%

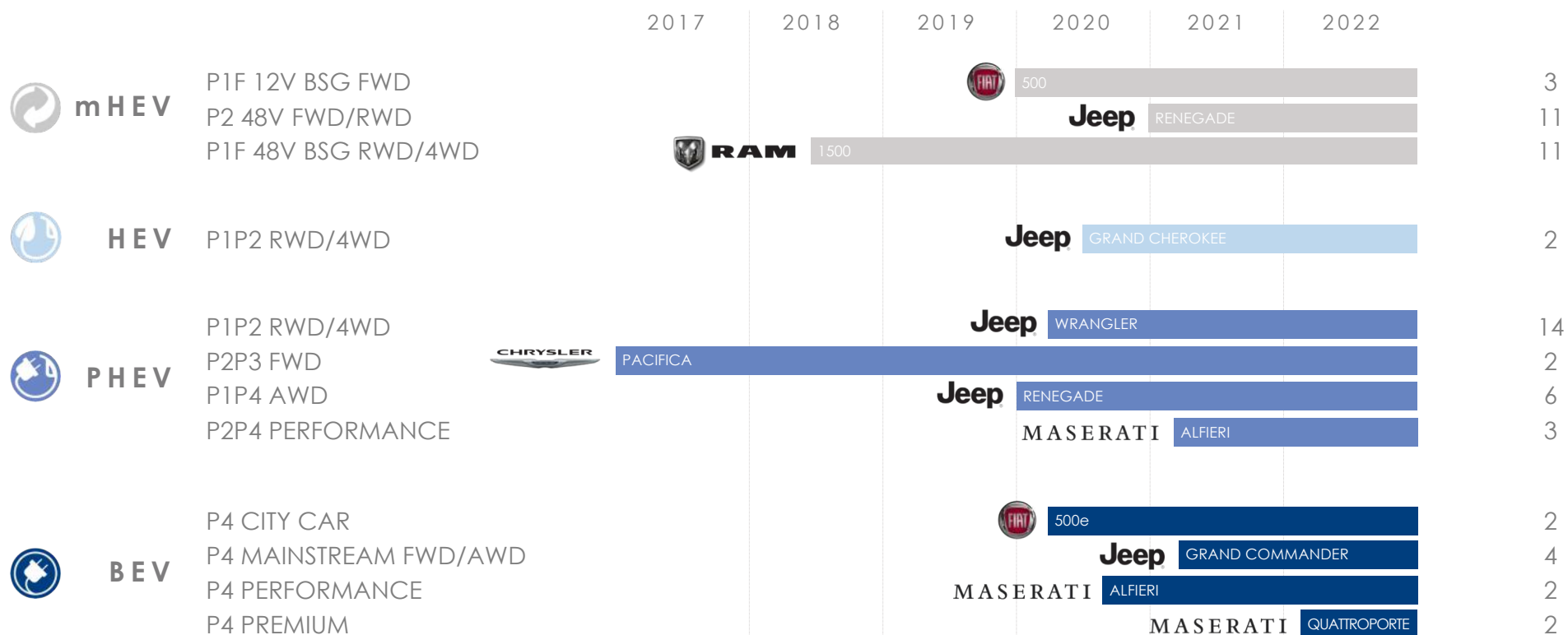
CO₂ REDUCTION TECHNOLOGY CADENCE

OVER 30 NAMEPLATES TO UTILIZE ONE OR MORE OF THESE EV SYSTEMS BY 2022



EV SYSTEMS

FIRST APPLICATION SHOWN NAMEPLATES



NOTE: MULTIPLE EV SYSTEMS CAN BE DEPLOYED ON ONE NAMEPLATE

FCA AND CO₂ REDUCTION

PREPARING FOR A RANGE OF POTENTIAL FUTURES



PROVEN COMPETENCY IN DEVELOPING EV TECHNOLOGY

LEVERAGING SYNERGIES AND VOLUME EFFICIENCIES
ACROSS A GLOBAL INDUSTRIAL FOOTPRINT

EV SYSTEMS DEPLOYED TO UNIQUELY ENHANCE THE
CORE ATTRIBUTES OF FCA'S POWERFUL BRANDS

PORTFOLIO OF EV TECHNOLOGIES WILL BE LAUNCHED
TO ENSURE COMPLIANCE IN EACH REGION