## BRAZIL ROADMAP FOR NATURAL GAS HEAVY DUTY VEHICLES: ACTION ITEMS FOR STAKEHOLDERS

					BRAZIL KUADMAP																				
SECTOR		PUBLIC SECTOR			GAS INDUSTRY				OEMS, SYSTEM & COMPONENT SUPPLIERS				FLEET OPERATORS				FUEL INFRASTRUCTURE SUPPLIERS				CIVIL SOCIETY				
ACTIONS	INTERAGENCY COORDINATION (VERTICAL & HORIZONTAL)	STANDARDS, REGULATIONS & TARIFFS (Poli-Techs)	INFORMATION , ANALYSES & COMMUNICATIONS	INCENTIVES, MANDATES & POLICIES	DEVELOP GAS INDUSTRY NGV STRATEGY PLAN	DEVELOP CNG, LNG & BIOMETHANE FUEL STATION NETWORK	& OUTREACH TO	ADVOCATE FOR GOVERNMENT SUPPORT FOR NGV MARKETS	TECHNOLOGY DEVELOPMENT	STANDARDS AND REGULATIONS	MARKETING & COMMUNICATIONS	GOVERNMENT RELATIONS (ADVOCACY & EDUCATION)	VEHICLE OPERATIONS	FACILITIES MANAGEMENT (Fueling & Workshops)	INFORMATION & COMMUNICATIONS	PERSONNEL MANAGEMENT & TRAINING	TECHNOLOGY & SYSTEMS DEVELOPMENT (also best practices)		STRATEGIC MARKETING & COMMUNICATIONS	ADVOCACY & EDUCATING GOVERNMENT		TECHNOLOGY & SYSTEMS DEVELOPMENT (also best practices)	FILL GAPS IN STANDARDS & REGULATIONS	STRATEGIC MARKETING & COMMUNICATIONS	POLICY ADVOCACY , EDUCATING & TRAINING
FIRST TIMEFRAME ACTIONS Year 1	(Horizontal coordination); 2) Create High Level Stakeholder Working Group on Gas Buses & Trucks (HD NGVs) for on-going policy input (Vertical coordination); 3) Evaluate Federal Fleet options to use NG variants;	of standards & regs for LNG trucks, fuel tanks, connectors, receptacies & stations; 2) Begin development of regulations for Dual- Fuel conversions, 3) Consider temporary exemptions (based on international stativregs for HDV LNG trucks while Brazil standards develop; 4) Require	analytic fools for TCO" & impact analyses (immission, e.e., for policy development (and fleets): 2) Create framework & institute data collection on AFVs; 3) Study potential adaptions of select public stations for 'HAPU's dedicated HDV stations near fleets inificaer urban	model for fleet operators and all other financial (tax) incentives; 2) Include bio-methane in incentive policies; 3) Develop HDV Fleet- Friently Fuel Station	Inked specifically to new NGV markets; 2) Create companion plan (including fuel station options/models) targeting HDV truck & bus fileets, related to existing and planned	vehicle manufacturers targeting fleets & municipalities; 2) Combine effort with OEMs & vehicle converters to identify target fleets, opportunities and their needs (especially Total	advertising campaign touting Environmentally Friendly, Abundant Gas	regulatory barriers & gaps, especially related to: NGV-2 connectors; CNG cylinders; LNG components/fueling;	NG bus & truck product offerings to fit customer profiles; 2) Ramp up NGV production capacity with vehicles fulfiling fleet performance and TCO requirements.	receptacle standards; 2) Advocate NGV-2 fuel connector & receptacle only for HDVs; 3) Dual- fuel suppliers, in	fleet operators to identify truck & bus needs w/AFV potential; 2) Create HD NGV	requirements (also to match gas pipeline supply to municipalities); 2) Advocate for NGV incentives to help	environmentally triendly alternative fuel options: vehicle availability, new or retrofit, purchase vs lease; best TCO; etc.; 2) Evaluate CNG vs LNG; 3) Consider being an early adopter, NGV Champion Pitot	fueling cost-benefit analysis vs locally shared fuel station option; fuel stations on frequent routes; range assessment; 2) If on- site maintenance will be	communicate with Public Sector (at all levels) for: 1.Funding and incentives; 2.Analytic TCO tools from government (and OEMs?); and 3.Standards or		for HDV fleets to facilitate adoption and use of CNG (remote monitoring; rapid repair services; training etc.);	advocate NGV-2 fuel connectors for HDVs (also at selected public stations); 2) Monitor proposed changes in gas composition	gas network expansion near fleets; 2) identify best fueling options for fleets: (portable; Mother daughter virtual pipeline	to create attractive financing options, particularly to support fuel station investments; 3) Create field data base (coordinate w/OEMs & government);	as most involvement and work is on-going) TRADE & INDUSTRY	availability and match to fleet vehicle preferences; 2) Evaluate	standards & regulations development (LNGVs; LNG Small Scale production; biomethane injection in pipeline.	on NGV needs, strategies, incentives & funding opportunities;	s government High Level Stakeholder Working Group on NGVs; 2) Advocate for data bases (tuel stations & vehicles); 3) Identify
SECOND TIMEFRAME ACTIONS Years 2 & 3		<ol> <li>Simplify on-going certification pathway for CNG Tankis (344) &amp; LMG tanks (344) &amp; LMG tanks (and hundliforms is make theoretices is make mechanology that is nod- mechanology that is nod- mechanologies (EFTb);</li> </ol>	and needs for NGV information to public &	Truck Fleet purchase	Help develop (wipublic sector) Blue Confort Jan b Integrate Blan b Integrate Blan blan help and San help and	<ol> <li>Help develop (wipublic sector) Blue Contrider plan to integrate biomethane and LNG is too boot narget NGV customers participation and the control of the sector of the control of the sector of the sector to the sector of the sector to the sector of the sec</li></ol>	Develop and implement angeled media compaign specifically for truck & bus fields outing economica & environmental benefits of NOVs.	<ol> <li>Advantate for subsidiation constraints for Substitution 2,Vehocite anomation tail anomation tail a</li></ol>		1) OEM and cylinder providers work, to certify CHG cylinders Types III & N. Monitor & alevity of the Monitor of alevity of the mand simethame) their quality standards best quality	w/NGV products; 2) Train marketing & dealership staff re: NGV opportunity; 3) Consider favorable	<ol> <li>Advocate a balanced approach to support alternative tuels, including consideration of well-sevimeter tousing the sevimeter balance and the sevimeter and conditions to make mighters NGV technology.</li> <li>Advocate traveate and the sevimeter and the sevimeter sevimeter and the sevimeter optical sevimeter.</li> </ol>	integration and implementation plan in consideration of growing the NGV fleet component (route planning and fueling on	upgrades for gas (as may be required), including Standard Operation Procedures (SOPa) for maintenance and fueling (on-site or en- route); 2) if on-site fueling is the chosen option, develop potential expansion plan to accommodate	loans; subsidies as may be available; 2) Develop information and public relations opportunities to make	drivers, fuel operators and maintenance staff (could be in conjunction with OEM and fuel station provider)	station designs & strategies (cookie cutter approach); 2) Work w/biomethane providers to provide 'green gas' for NGV	develop LNG station & fuel connector standards; 2) Advocate	1) Coordinate station rol outs with gas 8 whites providers, 2) Develop L CNG station by CNG states WGV Port plan for WGV Port plan for and two seaport taut seaport taut and statis integration (also werking with gas industry state/holders).	LContinue on going ella vicità & mentengra wijolicy makers & customers;	UNIVERSITY & ANALYSTS (including consultants)	<ol> <li>Initiate surveys &amp; focus groups on feet &amp; focus groups on feet &amp; mactices2) Analyze TOCS &amp; missions impacts, 3) and atty- measursh and development (R&amp;D) gaps &amp; needs;</li> </ol>	sips & needs for standards & regs (UNGIciomethane); 2) Evaluate potential for harmonized energy units to sell alternative fuels;	<ol> <li>Ch-going assessments of Blue corridors and hub &amp; corridors and hub &amp; spake bub is station strategies, 2) OLEPY or going Next analysed of vicionmental impact of vicionmental impact adoptor NOV Champion pilot feets 1s present findings. &amp; conclusions at public fora: 4) Help and engage in Clean Cities programs.</li> </ol>	including CNG cylinder inspection training for lightweight cylinders.
THIRD TIMEFRAME ACTIONS Years 4 & 5	possible) AFVs/NGVs in Federal fleets;	wfocus on safety & best practices; 2) Standardize energy units to sell alternative fuels (at least for fleet customers and stations); 3) Focusing	fuel station locator; 3) Continue to communicate successes and lessons	program at national, regional or local level to support the public	and achievements to adapt network expansion strategy as needed; 2) Continue incorporating NGV planning into larger gas industry transition to more competitive gas		cooperate with gas industry principals and NGV stakeholders to support (financially and logistically with fueling) national Blue Corridor	balanced alternative fuels strategy & fuel corridor plan: 2	Oktain customer feedback to provide movatimes to NEV technologies	Continue working within on-going auto-name & equivalony development process.	1) Engage In local Brazz Clean Office Brazz Clean Office And participation in Blue Confer or other NGV promotions.	Monitor and advocate favocable terms for domostic contact regulations	Collect Real & fault data, (incl. emissions); data, (incl. emissions); data, (incl. emissions); adoption plan in accordance with customer nequirements (incly us shorted with essel facet vehicles) with hsts/fil and slow-iil options	collection, evaluation & monitoring of fleet operations, maintenance, and TCOs.	<ol> <li>Provide Information to outlinems re address (NGN-2) Develop NGV on-geing operational data management;</li> <li>For municipal fleet data management;</li> <li>For municipal fleet operations, in particial; consider collaborations operational; regional or indicinal; regional or indicinal; regional or mational; regional; r</li></ol>	fleet expands	training wfleet customers and fuel station operators.	& amendments to standards &	station operators to determine improvement and best practices; 2) Expand outreach efforts	Bevelapo langer term instantuckun penning for homethame, LNG, L-CNG, Ippeline and visual pipeline expansion along contidors and utanc certers yet-to- be-reached by gas service.					