

# The Clean Air Bus & Natural Gas Vehicle (NGV) Roadmap for Almaty

31 March 2011



# **Almaty Transportation Development**

## **THE SITUATION**

# THE SITUATION\*

## The Almaty economy grows but the transport system deteriorates

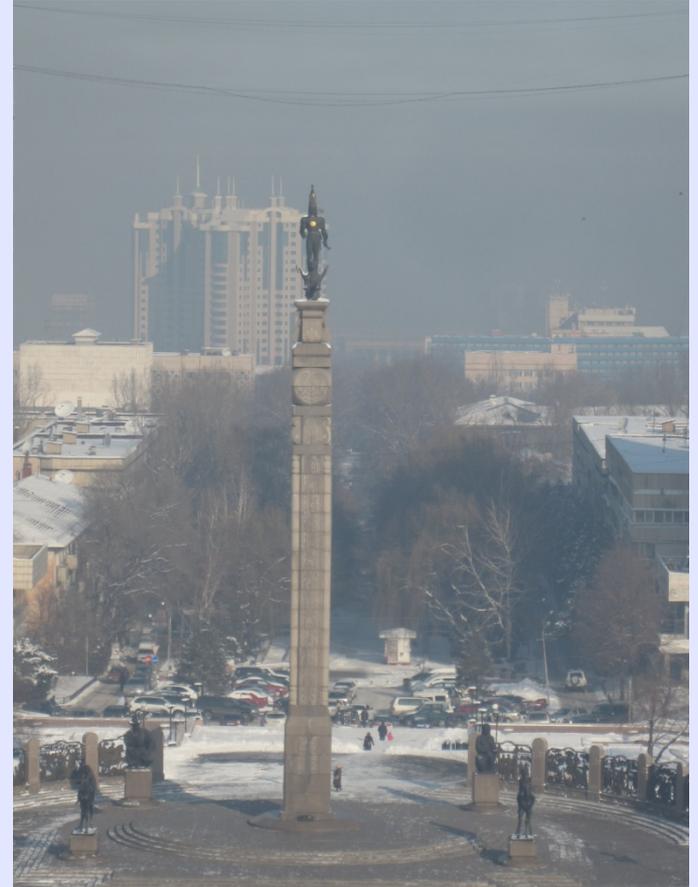
- Since independence in 1991
  - robust economic growth
  - rising incomes
  - influx of people from rural areas and other countries
- Urban sprawl & more private vehicles
- Increased traffic congestion, especially in rush hour
- Decreased public transport services & deteriorated quality

# THE SITUATION

**Public & private-owned bus companies are not profitable so owners & passengers suffer**

- Less trams and buses on less and shorter routes can't serve growing demand for transport
- Low fares don't cover costs to owners
- Bus maintenance & service is reduced so reliability & cleanliness suffer
- Air pollution increases from more cars and older, poorly maintained buses
- Health risks increase for everyone who breathes the air

# The air is brown



**The European Bank for Reconstruction & Development (EBRD) is providing a \$35 million, 10 year (+3 'grace' yrs) loan to revamp the Almaty transportation system**

**The loan will be supported by another \$5 million grant provided by the United Nations Development Program/Global Environment Facility**



**European Bank**  
for Reconstruction and Development



CELEBRATING TWENTY YEARS

**GLOBAL ENVIRONMENT FACILITY**  
INVESTING IN OUR PLANET



**UN**  
**DP**

# EBRD



## Goals of their \$35 million loan

- Renew buses in the city (electric & add CNG)
- Organize bus operations and introduce long term route planning
- Introduce standards
- Develop electronic ticketing system and possibly a price per kilometer fee structure (expect tenders by July 2012; implementation by January 2013)
- Attract more people to ride public transport

# The United Nations Development Program/ Global Environmental Facility project will provide an additional \$5 million in order to:\*



- Improve public transport & air quality
- Improve efficiency & quality of public transport services
- Integrate traffic management systems
- Demonstration & awareness of sustainable transportation (cars, buses, etc.)

\*UN Development Program, PART I: Project Information  
GEFSEC Project ID 4013



CELEBRATING TWENTY YEARS  
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# There are many challenges to overcome

- Many independent bus companies (20) are not highly capitalized
- Private operators can't afford to upgrade their fleets
- The buses are dirty and poorly maintained
- The drivers race from stop-to-stop to beat the competition out of the potential bus fares
- Traffic jams are a problem and more buses (also with dedicated bus lanes) could help alleviate the congestion

# Included in this ambitious transportation revitalization plan is the introduction of 200 clean burning natural gas buses

- **Economic:** cheaper fuel will improve profit
- **Environmentally friendly:** 99% reduction of particulates (black soot) & ~85% less smog-forming hydrocarbons
- **Safe** fuel & safe vehicles
- Start with municipal-owned buses and expand to private buses, city vehicles, commercial fleets & passenger cars

# The U.S. Department of Energy & the Argonne National Laboratory are providing a strategic 'Roadmap' as a tool to help bring a successful launch of CNG buses to Almaty.

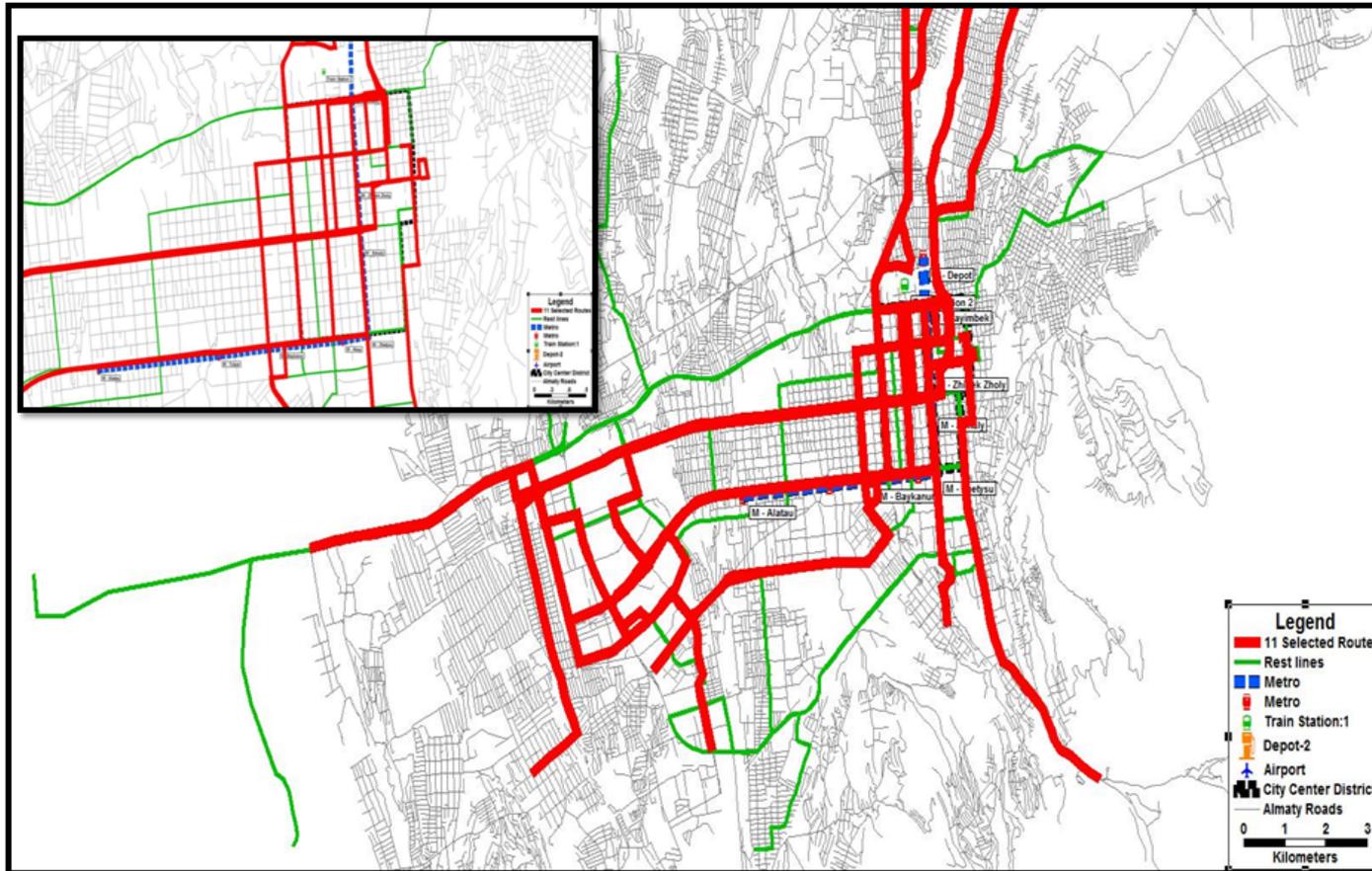
- Specific actions to be considered by the principal stakeholders (Akimat; AET; KTG)
- Development of current technical standards and regulations for NGVs and CNG stations (Federal government)
- Training requirements
- Integration into the larger transportation plan funded by EBRD
- Workshop: Clean Cities Transportation Workshop for Almaty (3/30-3/31)



# An NGV Opportunity for Almaty.....with challenges

- Paradigm change from liquid petroleum fuels but ultimately a transparent shift to gaseous fuel is possible
- Chickens and eggs (vehicles & fuelling stations) must come simultaneously
- Transition up the learning curve to transparent (and successful) *operation* of public & private vehicles
- *Commitment* required by *all* stakeholders to work together

# THE NGV ROADMAP for ALMATY

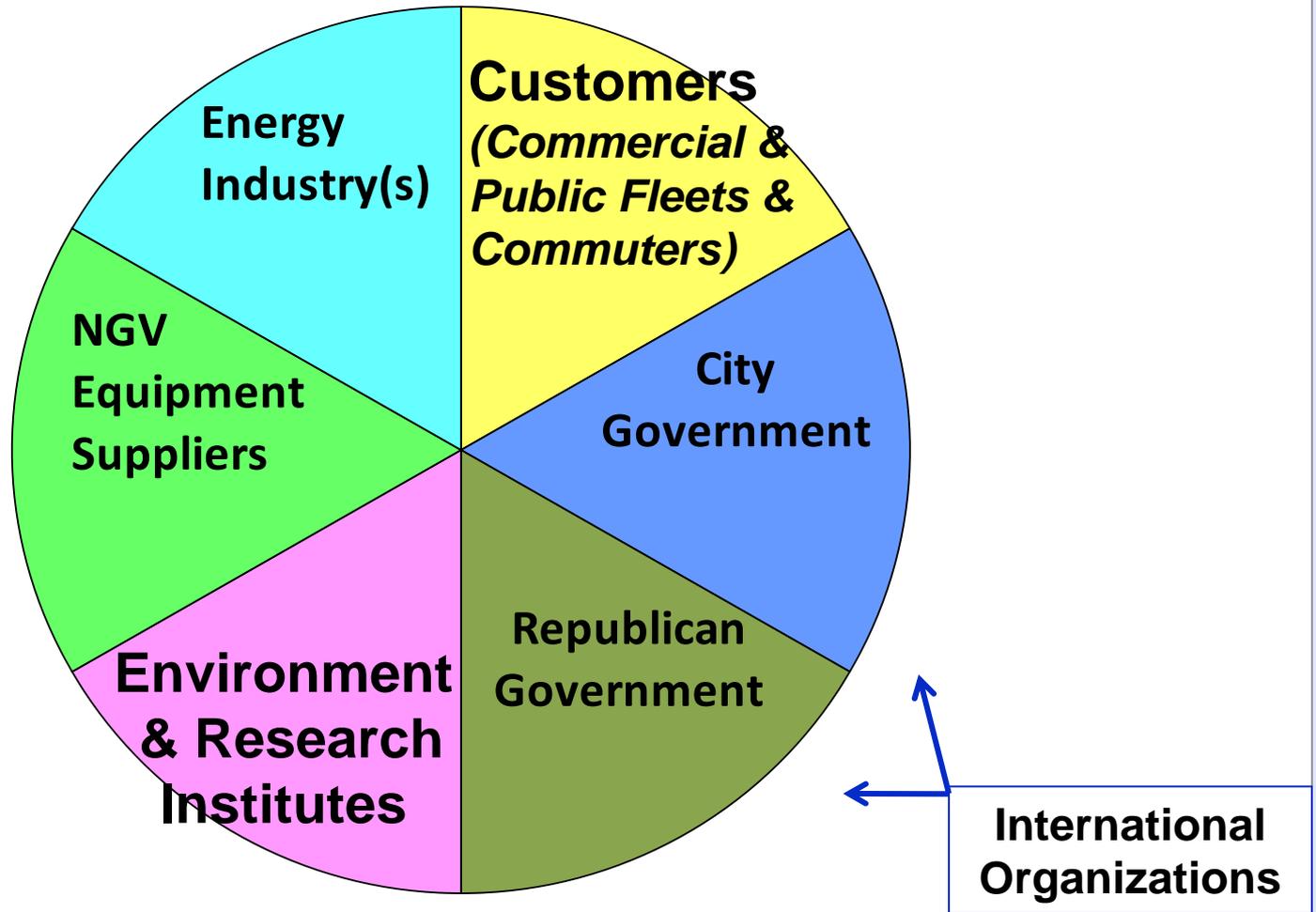


Proposed CNG bus routes, Almaty Bus Sector Reform Project

# The NGV Roadmap Development Process

- Identify stakeholders: principal & secondary
- Evaluate stakeholder documents and plans
- Multiple discussions with multiple stakeholders
- Roadmap draft
- Review & revisions by stakeholders
- Presentation of “working draft” Roadmap
- Periodic, regular review & revision by stakeholders

# THE CRITICAL STAKEHOLDERS (EACH ONE HAS A ROLE TO PLAY)



# A Dynamic Document

- Serves as a guideline but must be flexible to be modified as determined appropriate or desirable *by the stakeholders*
- Feedback required from stakeholders & ultimate customers to determine success of meeting milestones & goals
- Conduct periodic (annual) workshop of experts to adapt roadmap goals & priorities to changing circumstances

# The Roadmap

- Situation
- Goals
- Gaps & Challenges
- Action Items
- Priorities & Timelines
  
- Milestones

- Where we are today
- Where we want to be
- What is in the way
- What has to be done
- What is most important to do & in what order
- Landmarks & measures of success

# Gaps & Challenges to be Addressed

- Gaps in knowledge
- Technology limitations
- Market entry and structural barriers
- Regulatory gaps and needs
- Public awareness and acceptance
- Other barriers to achieving the goals and milestones

# Phases of the Roadmap

- 
- A vertical timeline diagram with a black arrow pointing downwards on the left side, labeled 'TIME' at the bottom. The timeline is divided into four horizontal segments, each with a time period on the left and a corresponding phase description on the right. The text for each phase is color-coded: red for the first two phases, blue for the third, and green for the fourth.
- 1/4 2011 • Immediate! (pre-start-up)
  - 2/4 - 4/4 2011 • Short term start-up (delivery of the buses, fuelling, maintenance & training)
  - 2012 to 2013 • Ramp-up (Buses running; new fuelling locations; standards development & adoption, training, fleet retrofits, etc.)
  - 2013+ • Long term sustainability & expansion (more fuel stations; retrofit & new NGVs, on-going training, etc.)

# CAN WE GET FROM WHERE WE ARE TO WHERE WE WANT TO BE?

- The CNG bus project is a relatively small but important part of a larger transport rehabilitation & development plan
- CNG buses, and expansion of the NGV program could be one of the important cornerstones leading to the improvement of the larger public, private and commercial transportation system.

# The Roadmap

## THE ROLE for AKIMAT



# THE SITUATION



- The City of Almaty faces a deterioration of its transportation system resulting in very high air pollution and a reduced quality of life.
- The AKIMAT Department of Passenger Transport & Roads developed a Strategic Plan 2010-14 in 2009 to address these issues.
- Despite efforts to improve and streamline the transport system since 2005, the public transport sector in Almaty continues to be inefficient, poorly organized and of low quality.

# THE SITUATION (continued)



- There is much work to be done by many of the Akimat departments. Implementing their plans will take a dedicated, disciplined effort to achieve specific milestones and results on a specified schedule.
- The addition of 200 new CNG buses and 300 electric trolley buses will begin a transition to a new era of cleaner transport system over the next decade.

# AKIMAT GOALS

## 'The BIG Picture'



- Primary task is to improve the entire public transportation system and improve the environment.
- Encourage international institutions to provide assistance (financial and technical) to the government and private companies.
- Next stage is to transform the 'public transport system' to natural gas

# AKIMAT GOALS

## For the Public Transport System

### Specifically



- Create the environment for private bus owners to use CNG more than petroleum-based fuels
- Develop and optimize routes and schedules for the buses to help improve quality and reliability of the service
- Institute electronic ticketing to ensure financial accountability of the fare payment system

# GAPS & CHALLENGES

## Institutional Conditions



- Akimat is overworked and understaffed
- Institutional coordination within Akimat is needed
- Lack of continuity with Ministry of Industry & New Technologies as their policies change
- Coordination and communication between Akimat and with external institutions (EBRD, UNDP/GEF, etc.) needs to be improved
- The system for vehicle inspections, implementation, enforcement and compliance needs major overhaul to ensure safer and more environmentally friendly vehicles on the road

# GAPS & CHALLENGES

## Information & Communications



- The statistics about the vehicle fleet population and registrations needs to be re-evaluated for accuracy, details and definitions since there seem to be some discrepancies between the data and reality. Improved data systems are essential to implementation of safer and cleaner vehicles for the public and private sector.
- Heightened awareness of the contributions of NGVs, its relation to health, should be made a priority by municipal officials and communicated to the public.

# THE CNG OPPORTUNITY



- The CNG bus program is only a small subset of the much larger transportation re-development program and its success depends, in part, on the success of implementing a new transport plan.
- CNG buses, and expansion of the NGV program could be one of the important cornerstones leading to the improvement of the larger public and commercial transportation system.

# ACTION ITEMS



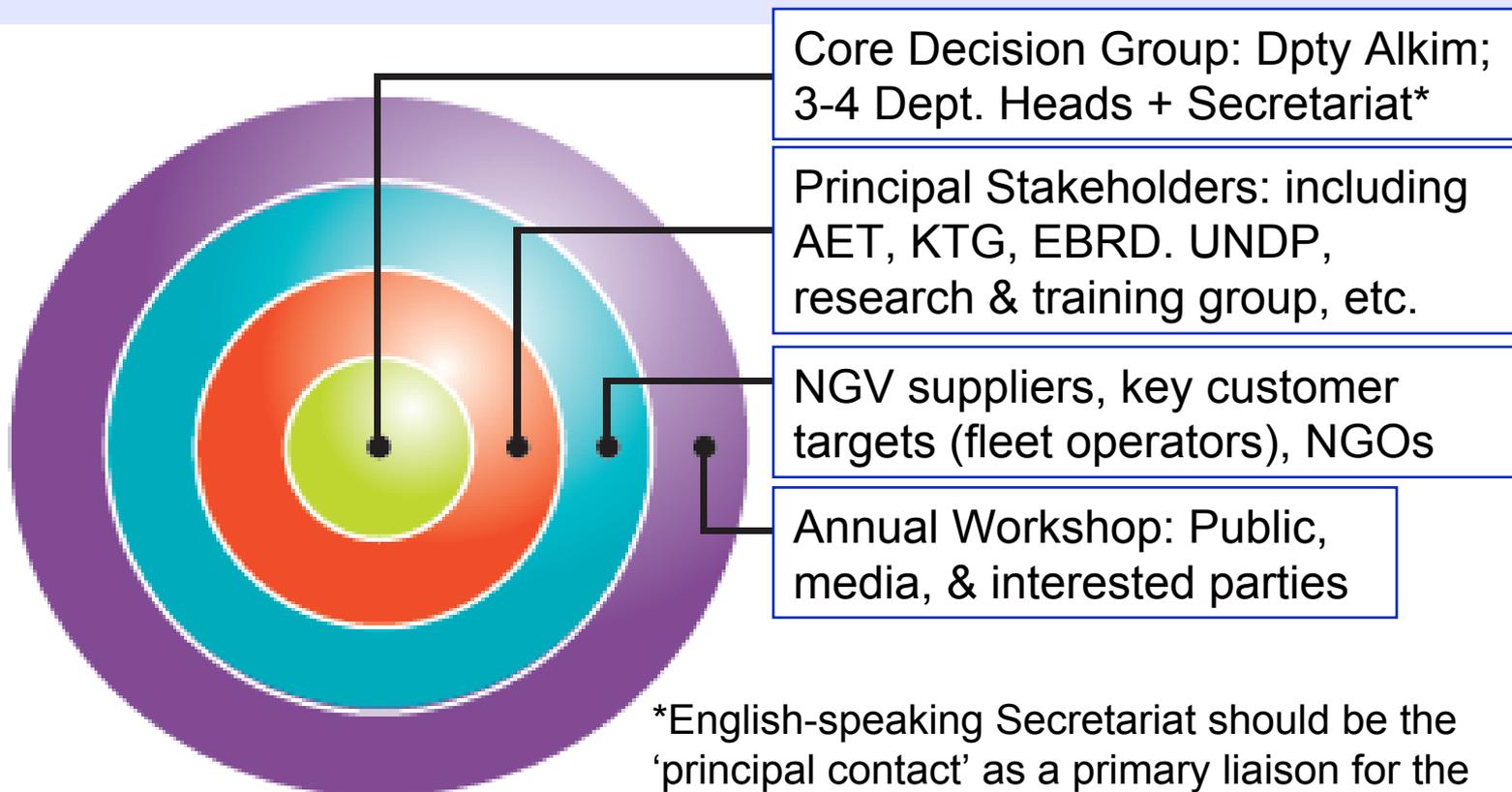
- Re-evaluate structure, membership & in (NGV/Transport) *Coordination Committee*
- Affirm (or amend) NGV Roadmap activities, priorities and schedule of milestones and achievements
- Incorporate Roadmap into the larger transportation management planning activities

# ACTION ITEMS



## Highest Priority (overall)

- Re-evaluate structure & membership (NGV/Transport) *Coordination Committee*



\*English-speaking Secretariat should be the 'principal contact' as a primary liaison for the Core Decision Group with all other stakeholders

# CLARITY ON THE COORDINATION COMMITTEE



- Consider re-evaluating the membership/structure of the Coordination Committee as it now stands, to include more ‘critical stakeholders.’
- Meetings each month for 6 months; once every two months thereafter; then quarterly
- Having a competent, bi-lingual Secretariat in the Core decision group is critical to effectively liaise with other stakeholders, supporting institutions, and respond to general questions
- (Henry Kissinger: “Who do we call when we call ‘Europe.’? Who do we call when we call ‘NGV Almaty?’”)

# TOPICS FOR COORDINATING COMMITTEE CONSIDERATION

- Fuels and Infrastructure
- Communications & Outreach (including media and public relations)
- Standards development
- Education/Training
- Legislation (Incentives; taxation; etc)
- Profile of Vehicles and Fleets
- Coordinating Committee Membership (on-going & additions as program develops)

# ACTIONS & PRIORITIES AKIMAT



AKIMAT MANAGEMENT	INCENTIVES & MANDATES	STANDARDS & REGULATIONS	INFORMATION & COMMUNICATIONS	LEAD BY EXAMPLE
<p><b>Identify Coordination Committee Members; amend/affirm Roadmap</b></p>	<p><b>Agree on natural gas price; cheap loans to bus &amp; commercial fleets</b></p>	<p><b>Work with Ministry of Industry/KTG on National Standards</b></p>	<p><b>Profile Public &amp; Private Vehicles &amp; Fleets (accurate data)</b></p>	<p><b>Convert Akimat Vehicles to NGVs</b></p>
<p><b>Monthly meetings to review actions &amp; milestones</b></p>	<p><b>Provide incentives, new tender and fare system</b></p>	<p><b>Create local regulations based on standards (vehicles; fuelling; inspection)</b></p>	<p><b>Publicize Akimat efforts to reduce pollution using clean, economic NGVs</b></p>	<p><b>Purchase new NGV fleet vehicles and/or retrofit vehicles</b></p>
<p><b>Annual public workshops with public &amp; private sector stakeholders (start 2012)</b></p>	<p><b>Mandatory &amp; enforced vehicle safety &amp; emissions inspections</b></p>	<p><b>Train code &amp; fire officials on safety standards &amp; regulations (start 2012)</b></p>	<p><b>Encourage broad commercial and public adoption of NGV technology</b></p>	<p><b>Provide employee incentives to convert/buy NGVs</b></p>

**Priorities:**    **First tier (to end 2011)**    **Second tier (2012)**    **Third tier (2013+)**

# PRIORITIES & TIMELINES



- **Tier 1: Immediate-short term**  
**3<sup>rd</sup> & 4<sup>th</sup> quarters 2011**
- **Tier 2: Ramp up**  
**2012 – 2013**
- **Tier 3: Long term sustainability & expansion**  
**2013 – 2014 and beyond, to contribute to other transportation goals**

# MILESTONES



## CNG milestones & priorities timed to fit into EBRD plan requirements

- 11.2011 Adopt Corporate Development Program
- By 2012: Incentive based contracts for bus tenders
- 1.01.2012: Budget allocated for new bus contract system
- 15.05.12: All CNG bus run on new incentive-based contracts
- 1.01.2013: Implement E-ticketing system
- 1.01.2014: Implement the ticket distribution and passenger control functions

# The Roadmap

## THE ROLE for KAZTRANS GAS (KTG) and British Gas Kazakhstan



# THE SITUATION



- The Concept of Compressed Natural Gas Use as Motor Fuel for 2010-2015 is a follow up to the Gas Sector Development Concept № 25 targeted for the period 2015 and approved by the Decree of the Government of RoK on January 11, 2002.
- The development of the NGV market has a variety of other federal Republican government-based precedents.\*

\*Environmental Safety Concept for 2004-2015, Gas Sector Development Concept for 2004-2010, Complex Program to Reduce Environment Pollution in Almaty for 2009-2018 and Agreement on Cooperation in the Area of Compressed Gas Use as Automobile Motor Fuel of May 26, 1995 (CIS).

# THE SITUATION



- Large indigenous gas reserves will be accessible as the vertically integrated natural gas production and distribution infrastructure develops (including CNG!)
- Increased use of natural gas addresses serious national and local environmental and air quality concerns
- Expansion of the gas sector brings clean, economic energy to the population and will create new job opportunities

# GOALS\*



## *Overall goal*

- Encourage broad use of CNG to replace petroleum fuels (diesel & petrol) in the transport sector (CNG Implementation Plan)

## *Fuelling infrastructure development*

- Develop sustainable CNG fuelling station network in Almaty, expanded to other cities connected by CNG 'corridors'
- Ensure the economic viability of the CNG network serving an adequate population of natural gas vehicles (NGVs)

# GOALS\*



## ***NGV Market Development***

- Targeted marketing of vehicle fleets (government, gas industry, customers)
- Active communications, public relations & advertising to support NGV development
- Encourage support/incentives from Republican government

## ***Technology Development***

- Motivation of NGV retrofit conversion centers and service infrastructure
- Ensure strict implementation and enforcement of standards, regulations and certification (with Akimat)



## GOALS\*

### ***Motivate government support: Work with Akimat & relevant Republican government entities***

- Develop harmonized technical standards and regulations for fuelling stations, vehicles, and vehicle retrofit systems, fuel storage, etc.
- Develop efficient & effective vehicle inspection program (mechanical & emissions) mandating safe & roadworthy vehicles
- Evaluate measurable economic, social and environmental benefits of expanded NGV program
- Create long-term incentives to support NGVs

# GOALS\*



## ***Motivate government support: Work with Akimat & Ministry Industry & Technology***

- Encourage government incentives that help motivate NGV & fuel station market growth & expansion, for example:
  - Transport tax exemption to 2020 for corporate and individual tax-payers, farm machinery and others operating NGVs.
  - Local authorities to be allowed to grant tax incentives NGV users.
- State-funded organizations to reinvest savings from NGV conversions within two years for energy saving and social support programs;
- Others to be determined within the Coordinating Committee

\*Concept Message: Compressed Natural Gas as a Motor Fuel (2010-2015), KazTransGas.

# GAPS & CHALLENGES



- Creating a complete regulatory framework (with adequate *implementation & enforcement*) would help ensure the safe conversion, maintenance & operation of NGVs and the fuelling infrastructure
- Potential NGV customers – private & public sector – must be identified
- Growth of the CNG station network must be balanced with adequate growth of the NGV population and in well-placed strategic locations (chicken & egg)
- Fuel stations could take 6 months to a year before required gas sales are achieved.

# ACTION ITEMS



## **KTG will create a detailed action plan based on their Concept Message**

- Universal standards for CNG station construction with approval by competent supervisory bodies
- Fund raising mechanisms -- investments, bank loans, leases, etc. – to encourage conversions to NGV
- Regional, district and city administrations engagement to accelerate CNG initiatives
- Regular NGV advertising campaigns
- CNG fueling station network development program in cities and corridors between cities, including facilities for conversion, maintenance & inspection

# DEVELOP DETAILED CUSTOMER PROFILE



		VEHICLE TYPES	AKIMAT FLEET	KTG FLEET	FLEET: DELIVERY	PRIVATE BUS #1
Light and Medium Duty Vocational Trucks	Van					
	Utility Van					
	Pickup					
	Cargo Van					
Passenger Cars and Light Trucks	Subcompact					
	Compact					
	Medium Sedan					
	Large Sedan					
	Mini-Van					
	SUV					
	Passanger Van					
	Light pickup					

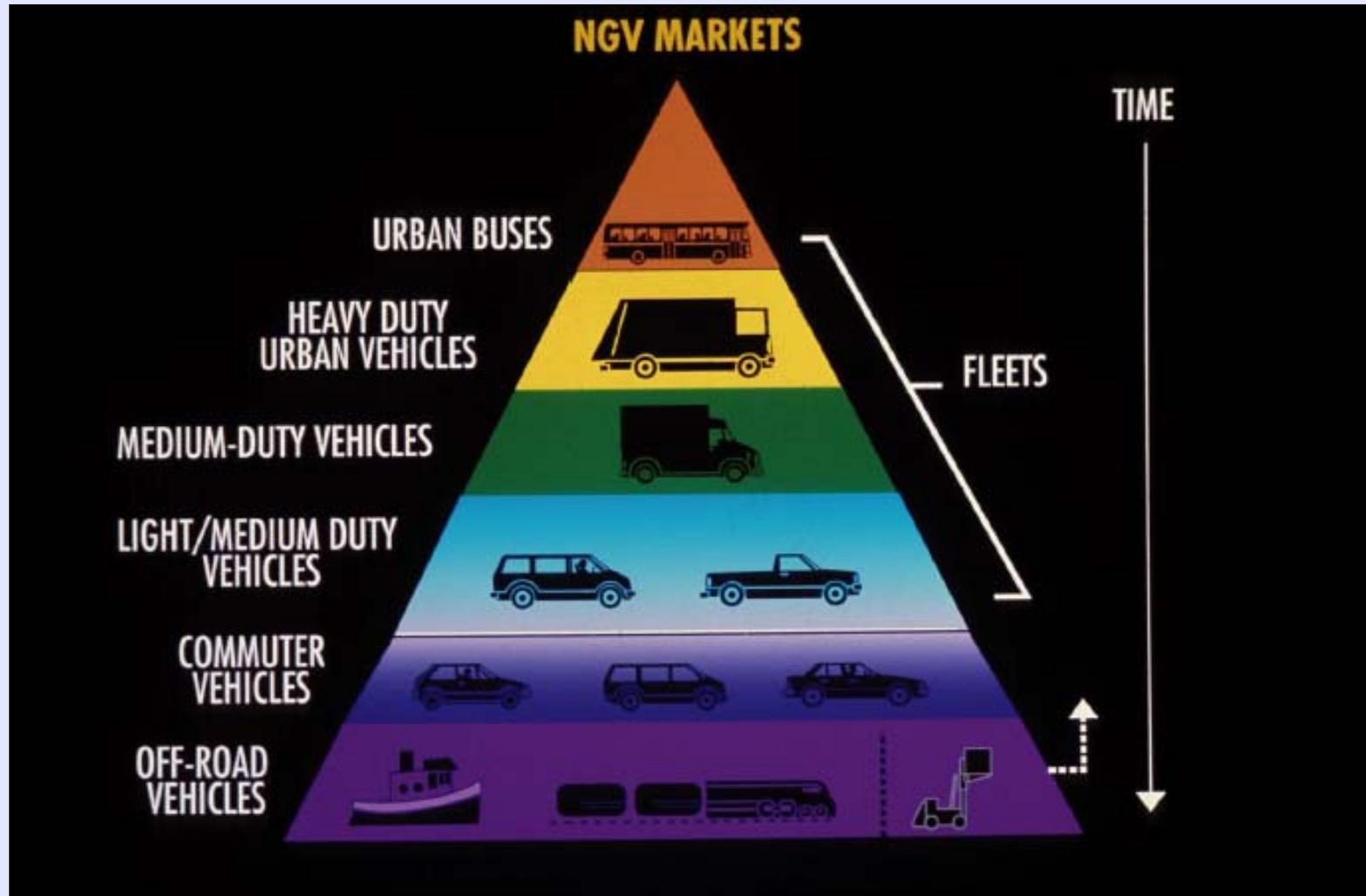


# Detailed Customer Profile

Type	Application	Example
Buses	Shuttle	
	Intercity	
	School	
	Transit	
Semi-Tractors	Port	
	Short Haul	
	Regional	
	Long Haul	
Heavy Duty Vocational Trucks	Van	
	Tow	
	Moving	
	Stake/Flat Bed	
	Beverage	
	Refuse	
	Dump	
	Cement	
	Car Hauler	
	Street Sweeper	
	Utility Truck	
	Reefer	
	Tank	

- Part of a larger Akimat effort to update & improve its vehicle & registration data
- Essential to identify best target vehicles for conversion and/or purchase

# Creating a detailed customer profile sets the stage for the NGV marketing strategy



# ACTIONS & PRIORITIES: KTG



ACTION PLAN	ADVOCATE GOVERNMENT SUPPORT	DEVELOP CNG FUEL STATION NETWORK	INFORMATION & COMMUNICATIONS	LEAD BY EXAMPLE
<p><b>Membership on Coordination Committee: Develop Action Plan &amp; CNG station strategy</b></p>	<p><b>Work with MINT, BG and Akimat to create national standards &amp; regulations</b></p>	<p><b>Part of action plan: Site, plan, tender &amp; construct first pilot stations Almaty</b></p>	<p><b>Profile Public &amp; Private Vehicles &amp; Fleet Customers</b></p>	<p><b>Convert KTG Vehicles to NGV; Purchase OEM NGVs</b></p>
<p><b>Develop NGV marketing team: Technical support to CNG stations</b></p>	<p><b>Develop range of tax, financial &amp; non-financial incentives concepts</b></p>	<p><b>Incorporate NGV conversion &amp; 'official' vehicle inspection centers into CNG stations</b></p>	<p><b>Public relations information &amp; advertising campaign to buy/convert NGVs</b></p>	<p><b>Provide employee incentives to convert/buy NGVs</b></p>
<p><b>Long term implementation of KTG action plan; work with Akimat Committee</b></p>		<p><b>Develop 'critical mass' of stations in urban centers; link urban centers with CNG corridors</b></p>	<p><b>Focused customer outreach: co-advertising; focus groups; exhibits; etc.</b></p>	<p><b>Advocate to all gas industry expanding NGV purchase program</b></p>

**Priorities:**    **First tier (to end 2011)**    **Second tier (2012)**    **Third tier (2013+)**

# PRIORITIES & TIMELINES



- Transforming KTG *Concept Plan* into *Action Plan*
  - *CNG station strategy is **critical***
  - *Public & private fleet stations*
- CNG station standards & regulations
- Working with Akimat's vehicle data collection activity, create customer fleet profile: which companies drive what vehicles (including Akimat & KTG)
- Use conversion of Akimat & KTG fleets to help create first stage of NGV conversion infrastructure – *create the chicken & the egg*

# MILESTONES



- KTG plans on building 4-6 CNG stations in Almaty in 2011
- 100 CNG stations are targeted for construction in the next 5-7 years
- A population of 50,000 NGVs is needed to support the fuel station network expansion
- Targeting 800 million m<sup>3</sup> gas sold to the sector by 2015; 1 billion m<sup>3</sup> sold by 2017
- Having the first vehicle conversion workshop built in 2010 in Almaty
- Creating a national NGV program including CNG stations linking cities



# MILESTONES

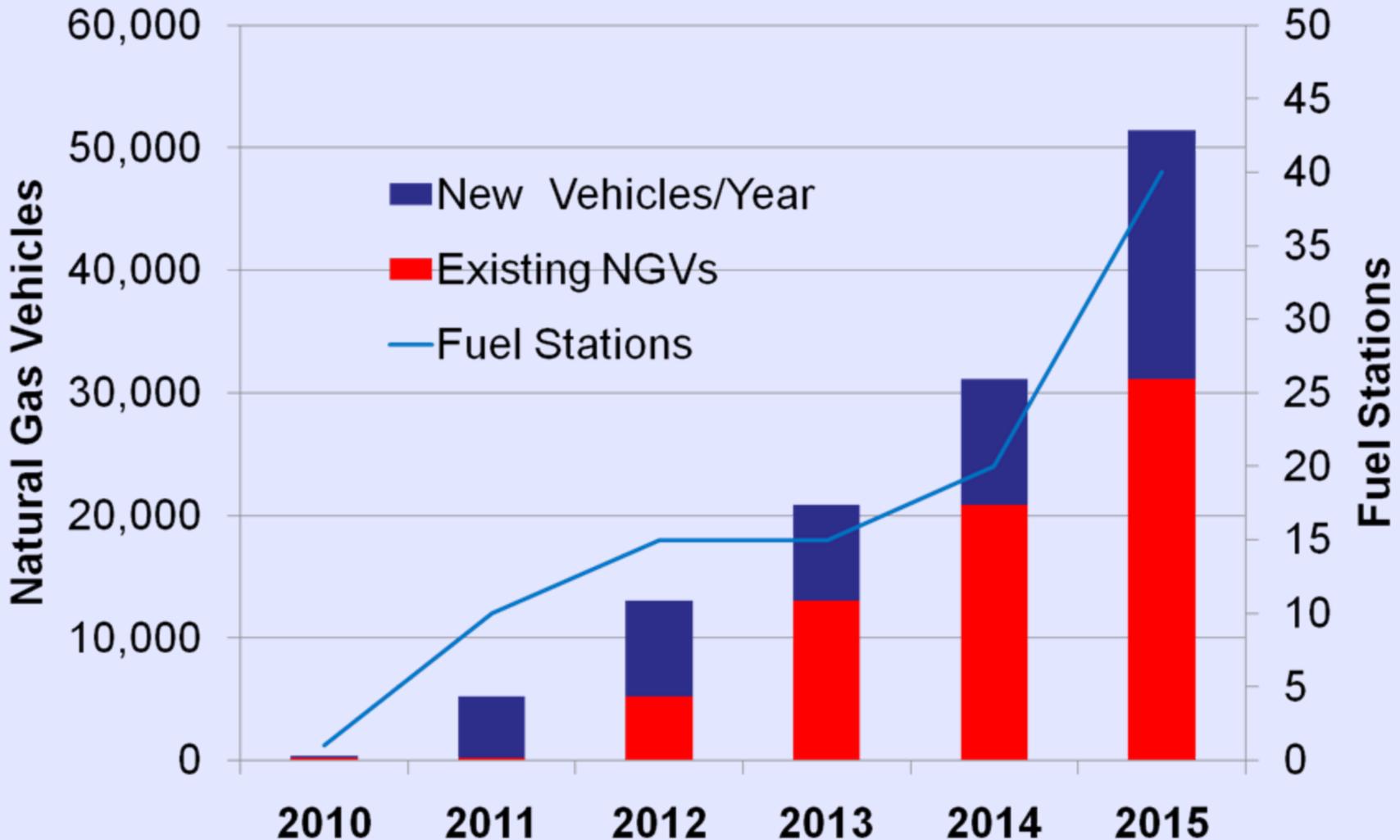
## CONCEPT NGV MARKET GROWTH\*

(Subject to further re-evaluation)

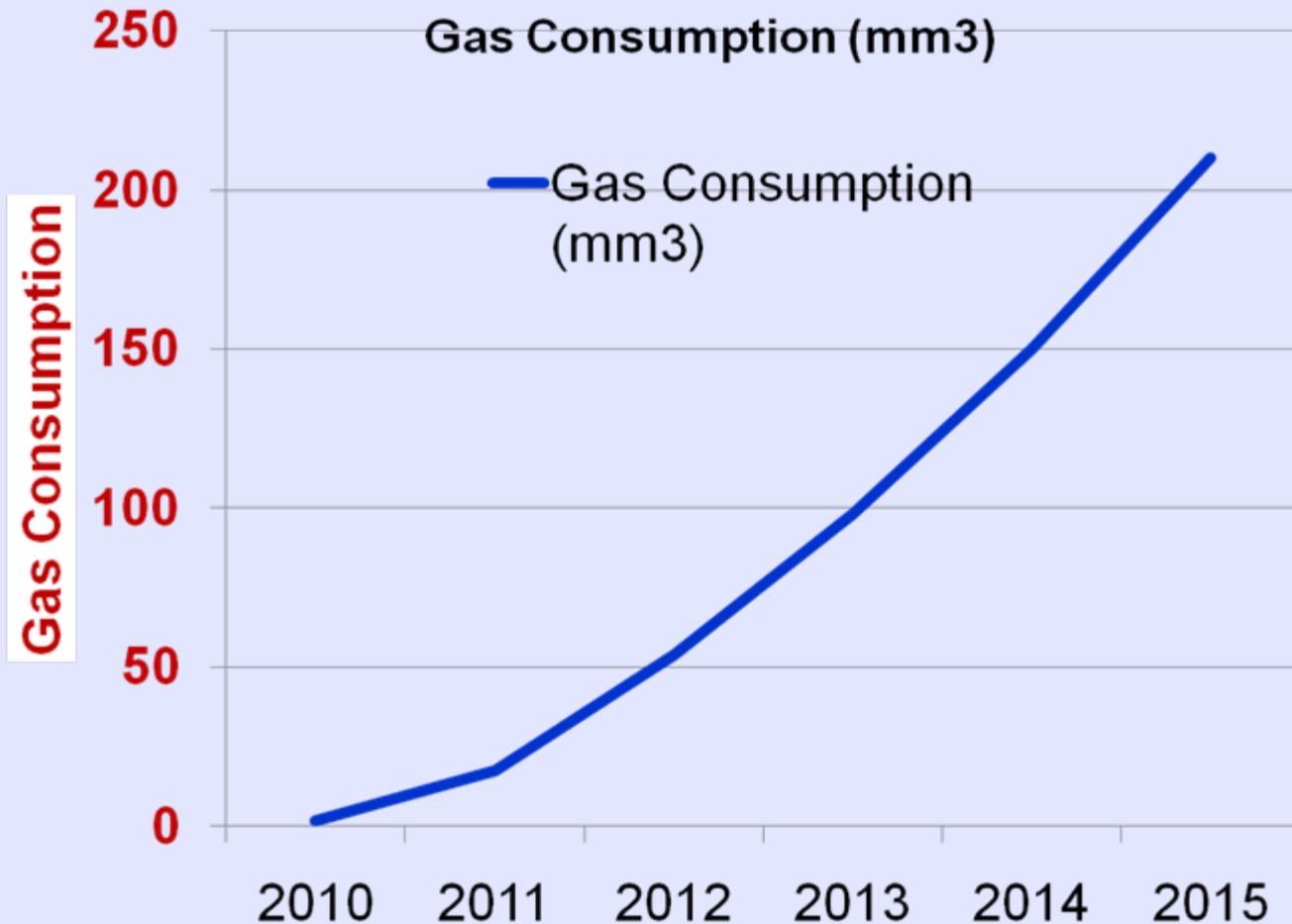
YEAR	New Vehicles per Year	Total NGVs	Fuel Stations	Gas Consumption (mm3)	Gas per vehicle (m3)
2010	200	200	1	1.5	7,500 (buses)
2011	5,050	5,250	10	17.5	3,465
2012	7,800	13,050	15	54	4,137
2013	7,800	20,850	15	98	4,700
2014	10,300	31,150	20	150	4,815
2015	20,300	51,450	40	210	4,081

\*Concept Message: Compressed Natural Gas as a Motor Fuel (2010-2015), KazTransGas.

# KTG Concept: Number of NGVs per Year & Total Fleet Growth



# KTG Concept: CNG consumption per year from anticipated NGV fleet growth





# British Gas Role & Goals

- **Has expertise with CNG and NGV program development**
- **Is supporting the development of the NGV program as an active stakeholder, installing the CNG station for the AET buses**
- **Uses United Nations regulations, ISO & European standards as a foundation for safe and reliable operation of CNG stations**
- **Will assist KTG & Ministry of Industry in standards & regulations development and possibly training.**

# The Roadmap

## THE ROLE for ALMATY ELECTROTRANS (AET)



# THE SITUATION



- AET is the only municipal operator of electric transport vehicles and is facing a major challenge to incorporate 200 natural gas buses into its service fleet.
- 25 other private companies operate large and small buses on 121 routes throughout Almaty.
- The bus network faces many problems by using over-worked, poorly maintained, heavily polluted buses.
- Bus operators would benefit from financial incentives that could help create a more reliable and economical bus network, subject to a number of system-wide operational changes in fare collection and scheduling.

# GOALS



- Incorporate new electric trolley buses and natural gas buses into service to expand capacity and replace older equipment.
- Maintain sound economic basis for AET using new ticketing, pricing and route options
- Upgrade maintenance and overall quality of service in accordance with EBRD & UNDP/GEF
- Contribute to emissions reduction of vehicles and transport system

# GAPS & CHALLENGES



- AET has no experience with internal combustion engine technologies or CNG specifically
  - Operations (driving, safety, etc.)
  - Maintenance
- Large-scale hiring of new personnel must be coordinated with arrival of new CNG buses
- Lack of operational rigor results in poorer economic returns, overcrowding, and quality of service is in need of major improvement

# ACTION ITEMS\*



- Staffing (new hires; expert supervisors; ensure staff levels adequate)
- Training (outside help & build inside domestic capacity (train-the-trainers))
- Maintenance planning
- Route planning
- Gas pricing & operations economics
- Consider creating separate CNG business/planning entity

\*See Almaty Bus Sector Reform Project report, ROM, August 2010

# ACTIONS & PRIORITIES: AET



COORDINATE WITH AKIMAT & EBRD	VEHICLE OPERATIONS	FACILITIES MANAGEMENT	PERSONNEL MANAGEMENT	INFORMATION & COMMUNICATIONS
<p><b>Membership on Coordination Committee: Plan future actions &amp; cooperation</b></p>	<p><b>Inspect buses for fitness &amp; compliance with Reg.110; maintenance schedules</b></p>	<p><b>Finish bus maintenance workshop; develop bus maintenance routines;</b></p>	<p><b>Hire &amp; train drivers &amp; mechanics (use suppliers &amp; outside institutions)</b></p>	<p><b>Information outreach to passengers re: new CNG (&amp; electric) vehicles</b></p>
<p><b>Focus on EBRD actions &amp; timelines; work with MINT, Akimat on new regulations</b></p>	<p><b>Ensure full record keeping: financials; operations, maintenance, &amp; emissions;</b></p>	<p><b>Consider bus storage improvements; new facilities &amp; more fuel options</b></p>	<p><b>Institute train-the-trainers using outside &amp; domestic institutions</b></p>	<p><b>Optimal information re: bus schedules, ticketing ,etc.</b></p>
<p><b>Long term implementation of EBRD plan; input on routes, incentives, prices</b></p>	<p><b>Ensure medium-long term parts replacement, emission tests; maintenance</b></p>	<p><b>Medium &amp; long term facility management plan, budget, personnel &amp; equipment needs</b></p>	<p><b>Implement new pricing, ticketing &amp; scheduling procedures</b></p>	<p><b>Outreach &amp; market research to gauge public acceptance</b></p>

**Priorities:**    **First tier (to end 2011)**    **Second tier (2012)**    **Third tier (2013+)**

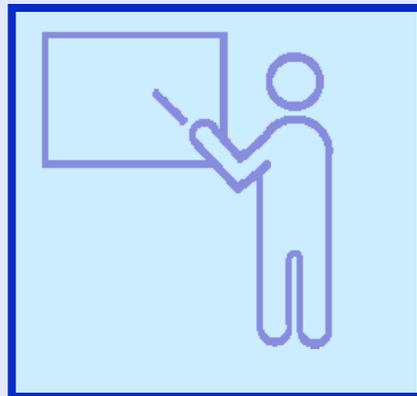
# PRIORITIES & TIMELINES



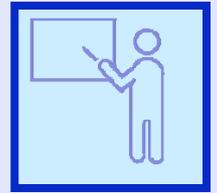
- Incoming inspection of buses for fitness of service
- Compliance with regulations (R.110, European bus laws [2001/85/EC] , and basic tender requirements
- Hire & train enough drivers
- Hire & train enough mechanics
- Ensure bus facility can accommodate new CNG vehicles

# The Roadmap

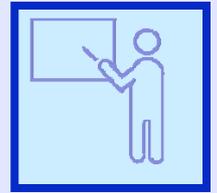
## STANDARDS REGULATIONS & TRAINING



# THE SITUATION



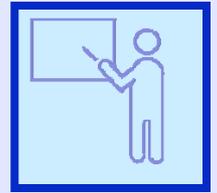
- Currently Kazakhstan relies on out-of-date Russian 'GOST' standards for vehicles & fuelling stations.
- European and international standards exist for all aspects of the NGV chain
- United Nations Regulations based on these standards are a building block to NGV development that promote global harmonization, safety & reliability of NGVs
- The adoption of new standards (and regulations) for safety and reliability are fundamental to the success of the Kazakhstan/Almaty NGV program



# GOALS

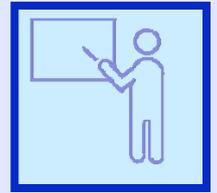
- **Provide short-term expertise** for bus inspections, fuel stations, and workshops
- **Adopt standards and regulations** based on existing models (reduce time; build confidence)
- **Provide training to in-country people** to build expert inspection & regulation implementation
- **Train-the-trainers locally** to ensure widespread expertise for the future

# CHALLENGES



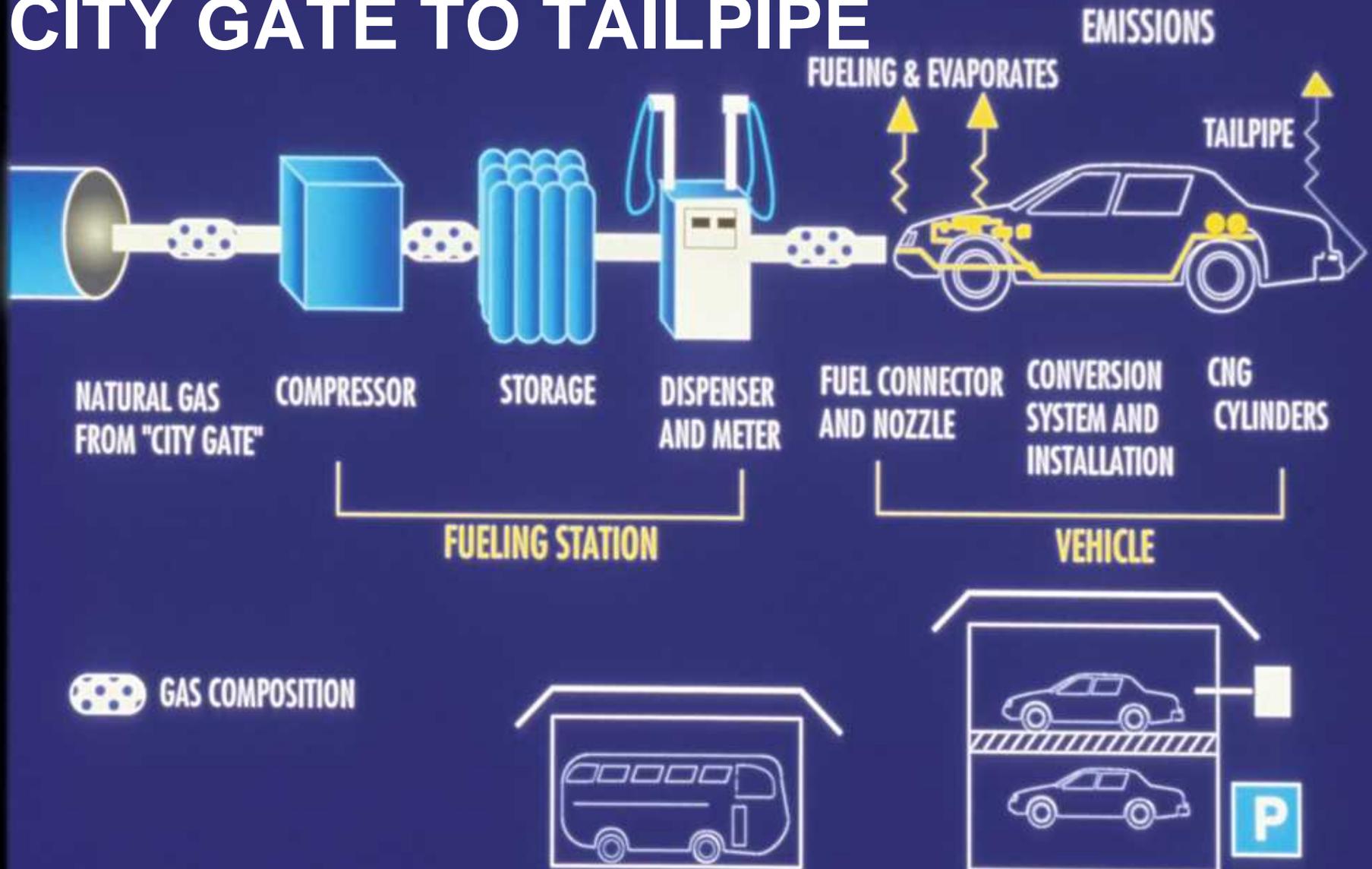
- Kazakhstani institutions that can train bus drivers, mechanics or, in future, people to retrofit vehicles to natural gas must be identified
- In the short term outside expertise is needed to help create *local* and *national* capabilities and expertise
- NGV equipment suppliers – especially vehicle conversion companies – will need to be prepared to do training that is compliant with R.110.

# Model Regulations

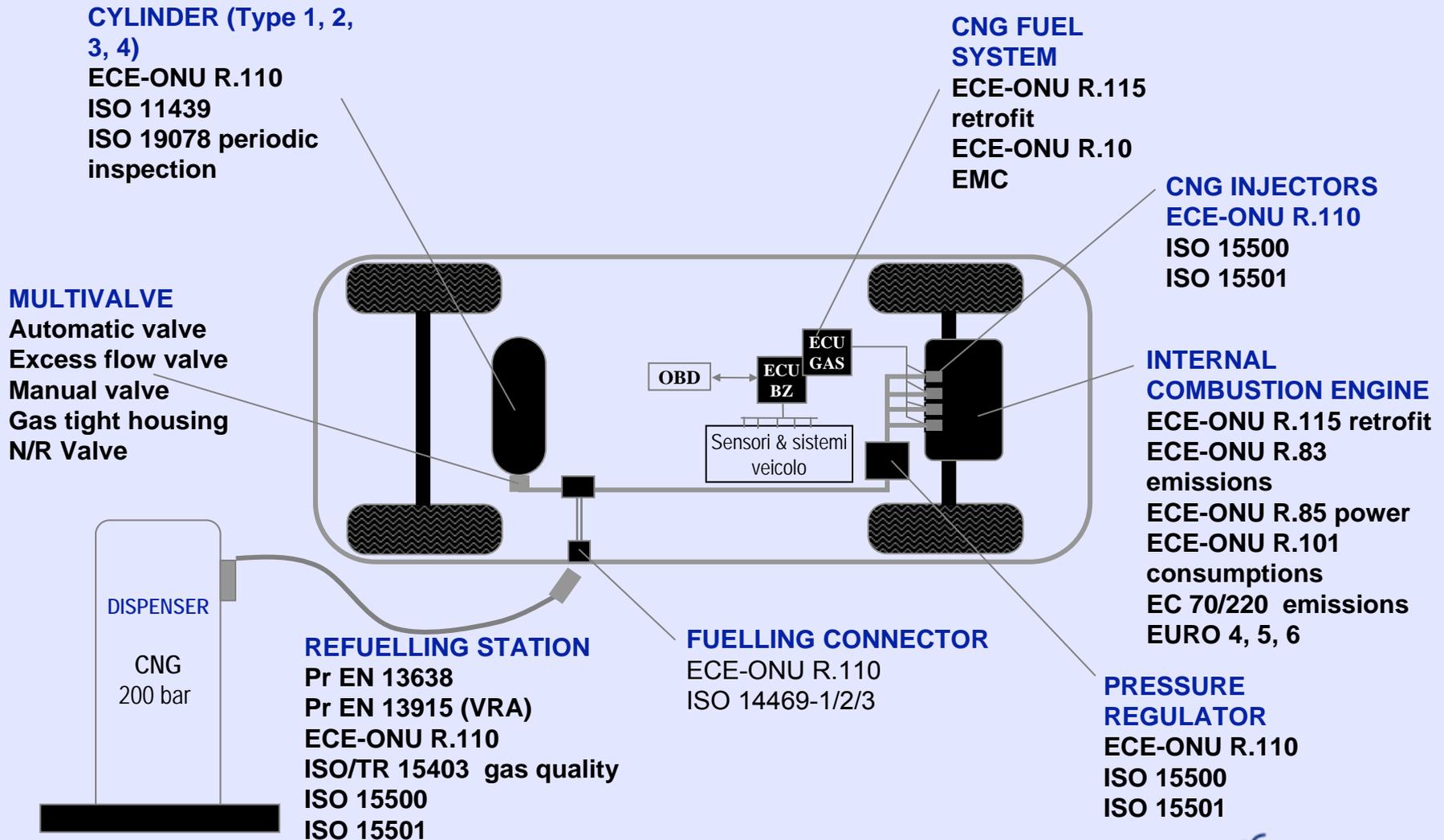


- British Gas contracted a study and comparison of existing NGV standards for vehicles, stations, workshops and related components.
- Recommendations include adoption of existing standards as the basis for Kazakhstan codes:
  - **Vehicles (United Nations/ECE 110 & 115);**
  - **Fuelling stations (VdTUV 510; future prEN 13638); /Merkblatt 757) (*Europe/Germany*)**
  - **Conversion workshops (vDtuev, *Germany*)**

# NGV STANDARD UNIVERSE FROM CITY GATE TO TAILPIPE



# International Standards & United Nations Regulations for Typical NGV Bi-fuel System



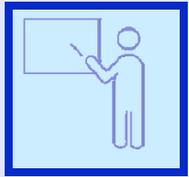
# Priority Training Subject Requirements



- Vehicle roadworthy inspection
- Delivery to customer inspection: regulatory compliance
- Driver training (driving, emergency response actions)
- Refuelling
- Mechanics: safety training, engine repair & maintenance, diagnostic repair systems, cylinder inspection
- Compressor station operation & maintenance
- Periodic inspections including CNG cylinders and tailpipe emissions
- Vehicle conversions & conversion workshops
- **Vehicle facility design/redesign (fleet storage, fuelling: fast-fill; slow fill)**
- **Design (or upgrading) of indoor maintenance facilities**
- **Fire marshals, safety personnel, & local code officials**
- **Training the trainers**

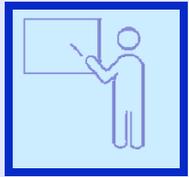
**Priorities:** **First tier (to end 2011)** **Second tier (2012)** **Third tier (2013+)**

# Integrating Training Expertise



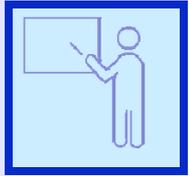
- **Notified Bodies:** Only types that can certify trainees via established knowledge tests
- **Independent International Training Institutes (& consultants):** provide certification of participation, but generally not formal certification
- **Equipment suppliers:** Certify installers to their company specifications & in conformity to international regulations
- **Domestic Training Institutes:** Expert trainers who must be 'trained-to-train'
- **Educational Institutions:** University-level & technical institutes that develop curricula to teach requirements for entry-level employment opportunities

# ACTION ITEMS



- Immediate AET: Inspect in-coming buses
  - Roadworthiness (no fuel leaks, etc.)
  - Regulatory conformity: did you get what you paid for?
- Coordination in standards & regulations development (Akimat; MINT; KTG; BG)
- AET: Drivers & mechanics trained
- Outside training services required while internal capacity building can occur! *Question: Who will be responsible (leadership & financing) the overall training strategy?*

# MILESTONES



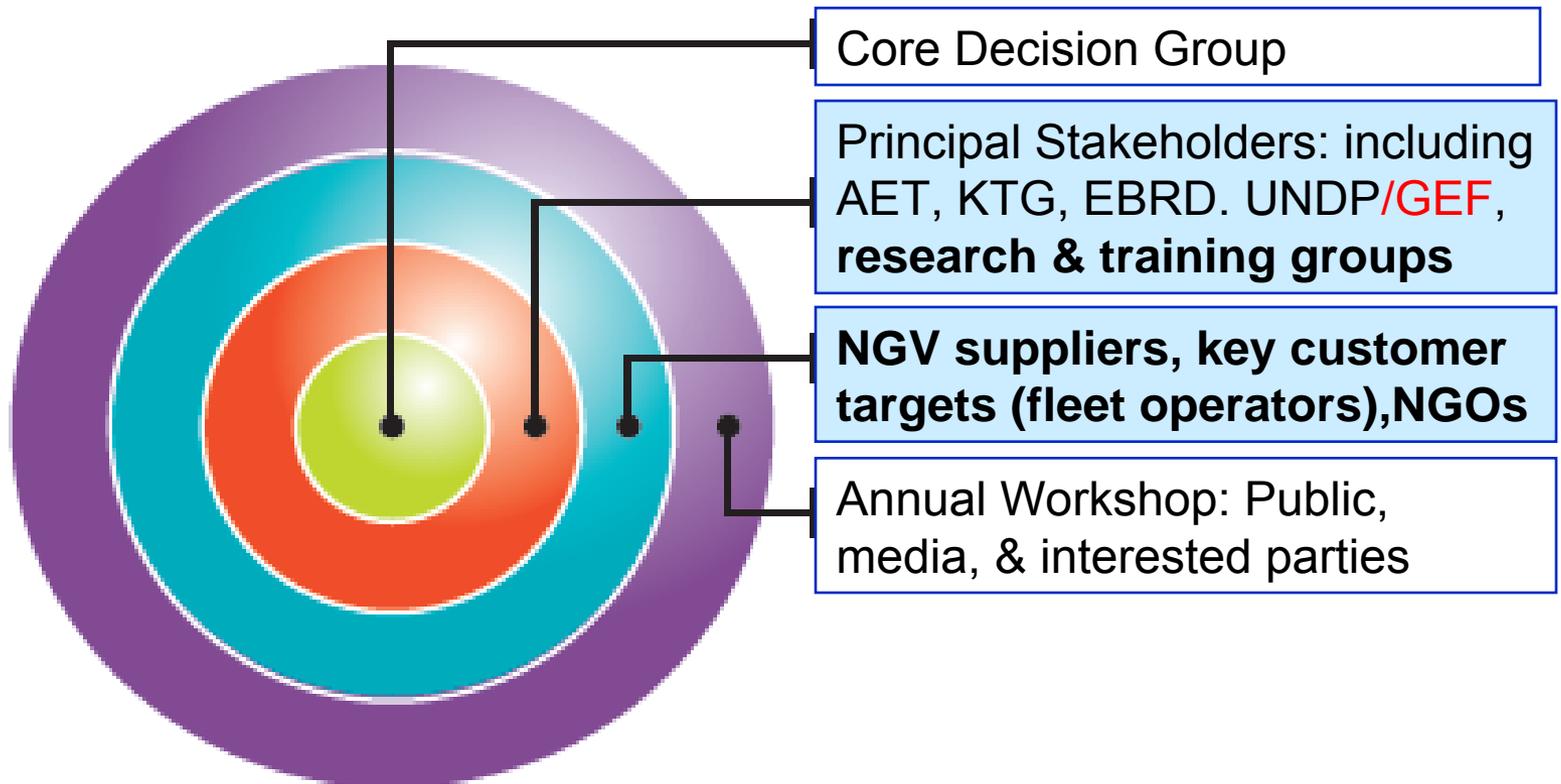
- June 2011: All buses inspected for roadworthiness and regulatory conformity
- Mid-to-end of 2011: All drivers & mechanics trained by (AET)
- September 2011; latest end of 2011: Working with MINT, complete designation of standards & regulations (even if not yet in complete legal status).

# The Roadmap THE ROLE for OTHER PRIVATE SECTOR STAKEHOLDERS



**COMMERCIAL FLEET OWNERS & OPERATORS  
RESEARCH INSTITUTES  
EDUCATIONAL INSTITUTIONS  
ENVIRONMENTAL GROUPS  
NON-GOVERNMENTAL ORGANIZATIONS**

# Different stakeholders with common goals can provide valued input to decisions



# Multi-stakeholder involvement

- **Commercial fleets** are a critical NGV target market. Their views & needs will help shape strategies, policies, incentives, etc.
- **Research institutes** can perform vital analysis that help shape (and re-shape) policies and indicate the progress and results of policy implementation.
- **Educational institutions** can help create and shape the NGV knowledge to grow the market from the bottom up
- **Non-governmental organizations** can help draw support from the private and public sectors

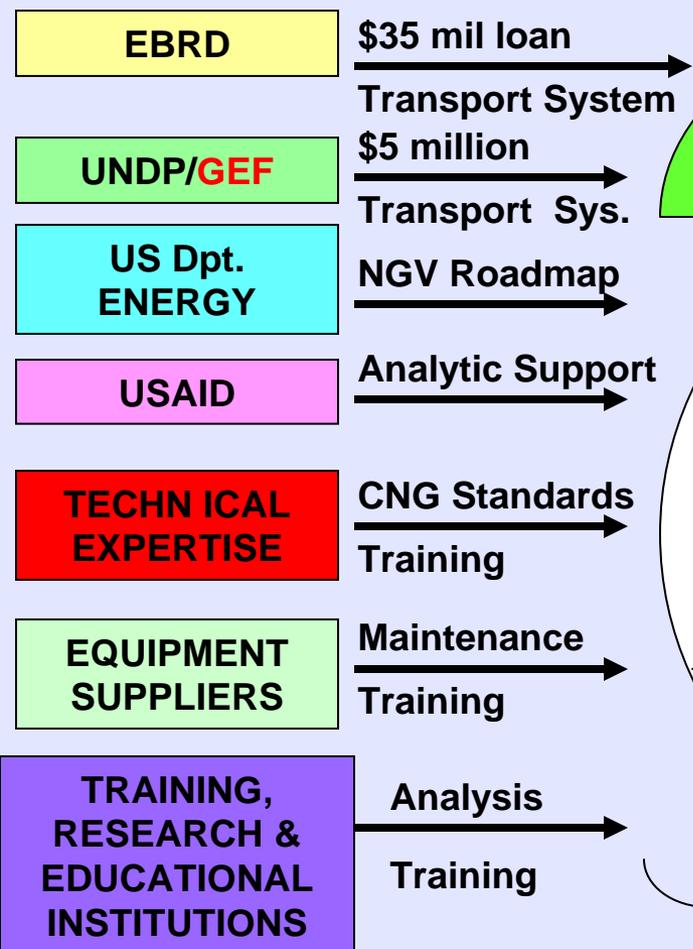
# IMPORTANT ROLES FOR NGV EQUIPMENT SUPPLIERS

- **Initial delivery** of reliable and safe equipment and systems
- **Develop local presence** to ensure downstream service and maintenance
- **Provide training** (charged separately or part of the original tender) to ensure local capability to handle & maintain equipment (capacity-building for future growth)

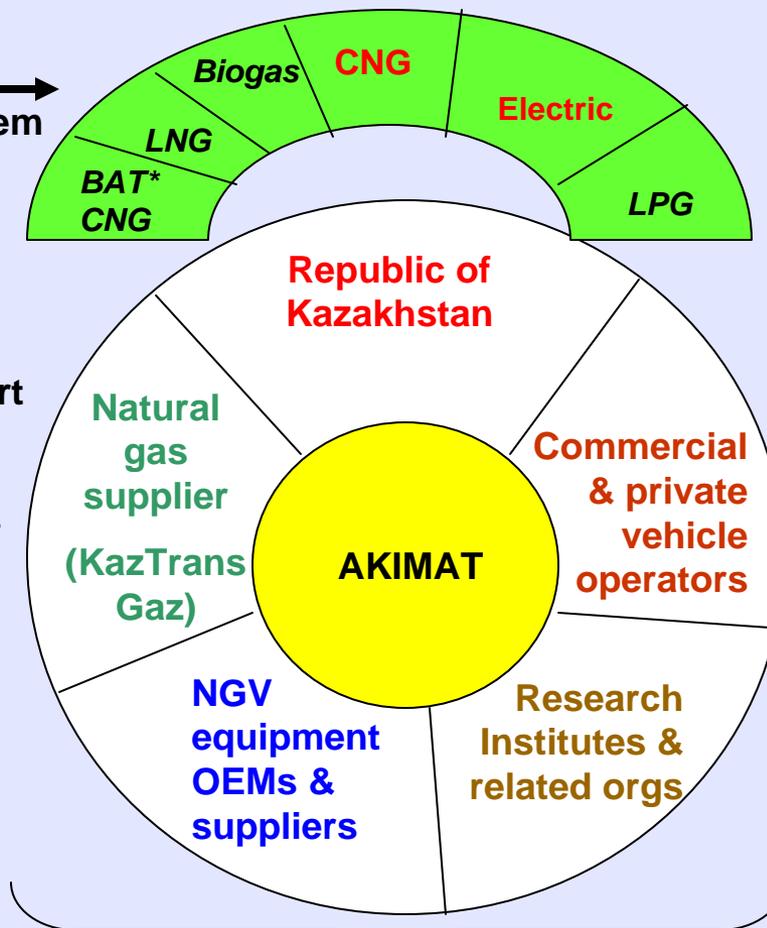
# CLEAN FUEL TRANSPORT in ALMATY

## A Road Map for Implementation (Clean Cities)

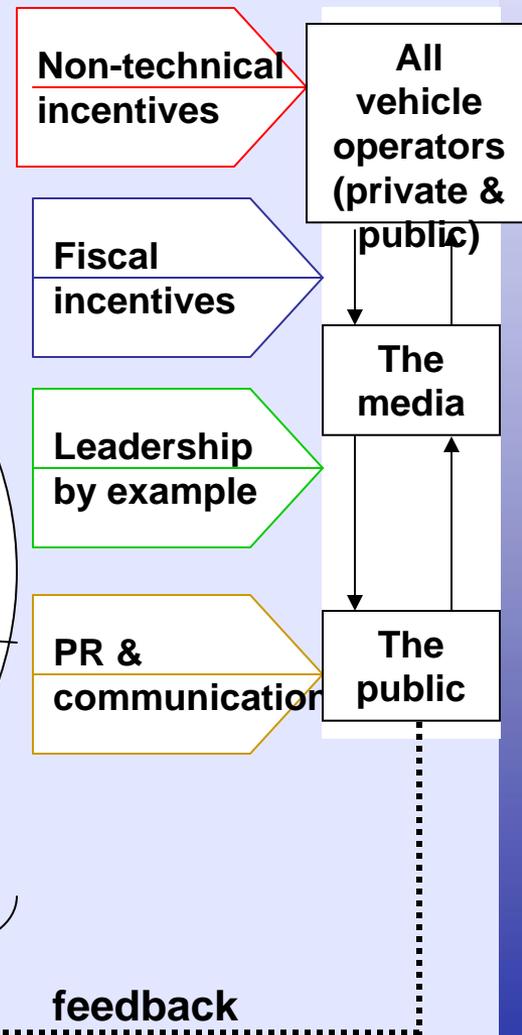
### RELATED ORGANIZATIONS & SUPPORT PROGRAMS



### NEW TECHNOLOGY INTRODUCTION



### THE MARKET



feedback

\*Best Available Technology

# The Clean Air Bus & Natural Gas Vehicle (NGV) Roadmap for Almaty

