Lessons Learned – Key Biofuel Markets

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ASEAN-U.S. Enhanced Partnership

Biofuels and the Automotive Industry Seminar

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Overview

- Biofuel market positive interventions
- Examples of markets that have promoted biofuels
  - US (E10 as standard grade)
  - Sweden (E85 as new additional grade)
  - UK E85 (example of inadequate incentives)
- Fuel quality needs

Three Pieces of the Policy Puzzle

Bio-fuels

1 *Environment*

- **Reduce pollutants**
- **Reduce greenhouse gas emissions**

2 Energy

- **Energy security**
- **Reduce dependency on petroleum**
- **Diversify energy sources**

3 Agriculture

- **Create new markets for crops**
- **Open trade barriers**

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US Ethanol Use

- Primarily focused on energy security
- Has become joint biggest global ethanol market
- Mainly by using 10% ethanol within standard petrol
  - RFG requirements – was MTBE, now ethanol
  - E10 fuel duty incentives

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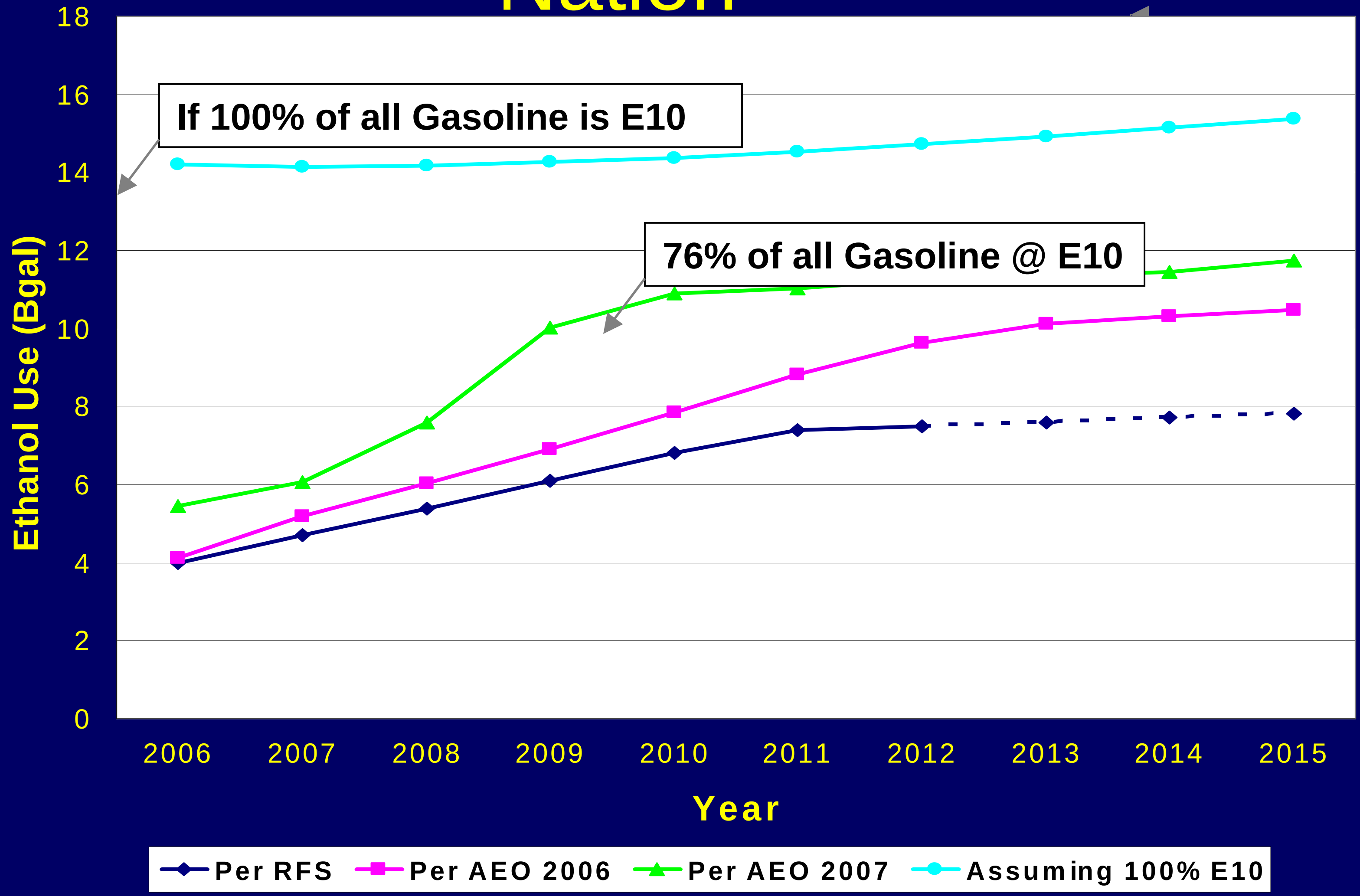
US market -Ethanol is Sweeping the Nation



Source: EPA presentn at SAE Gov't – Industry Meeting, May 15, 2007

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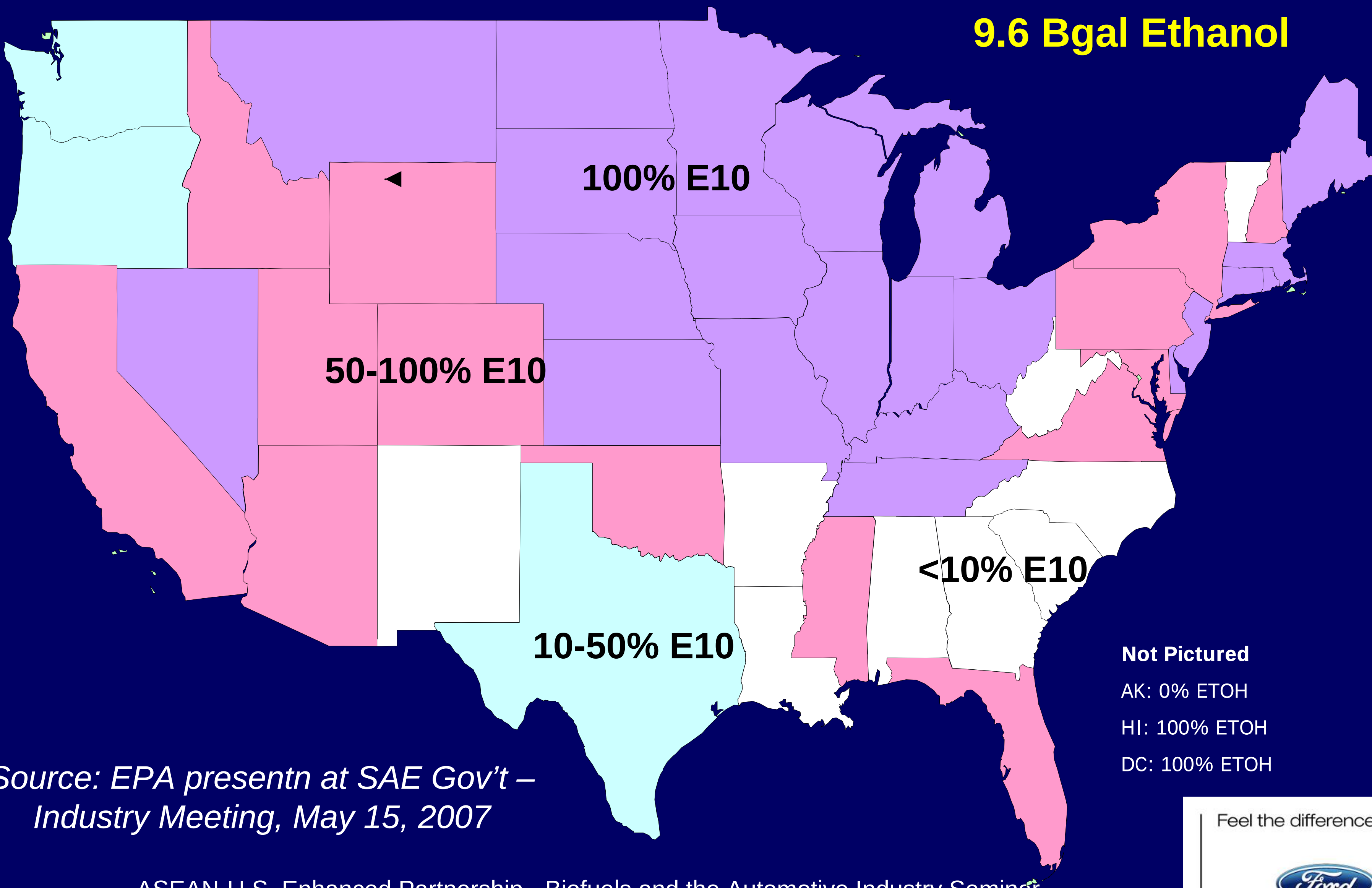
US -What The Country May Look Like in 2009



Source: EPA presentn at SAE Gov't – Industry Meeting, May 15, 2007

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Role model Sweden

- Long term target of no mineral oil dependency
- E5 (5% ethanol) already used for almost all gasoline

<u>But</u>

- Target for biofuel use well beyond 5%

Developing a renewable fuel market - role model Sweden

The “chicken-egg” loop:

- Developed fuelling infrastructure needed for vehicles.
- Sufficient vehicles needed to generate a profit from the filling stations
- Need national govt to generate momentum via tax discounts – but will be reluctant without vehicles and fuel supply being already in place

Sweden 1992: Start with 50 Ford Taurus FFV’s

- Creation of a buyers’ consortium
- Creation of partnership with local ethanol producer

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Current Sweden Incentives

Fuel Duty Zero duty on bio-ethanol except for VAT

Company Car Tax 20% reduction for FFVs

Annual Road Tax 33% lower than petrol

Car Parking Free Parking for EEV in 30 cities

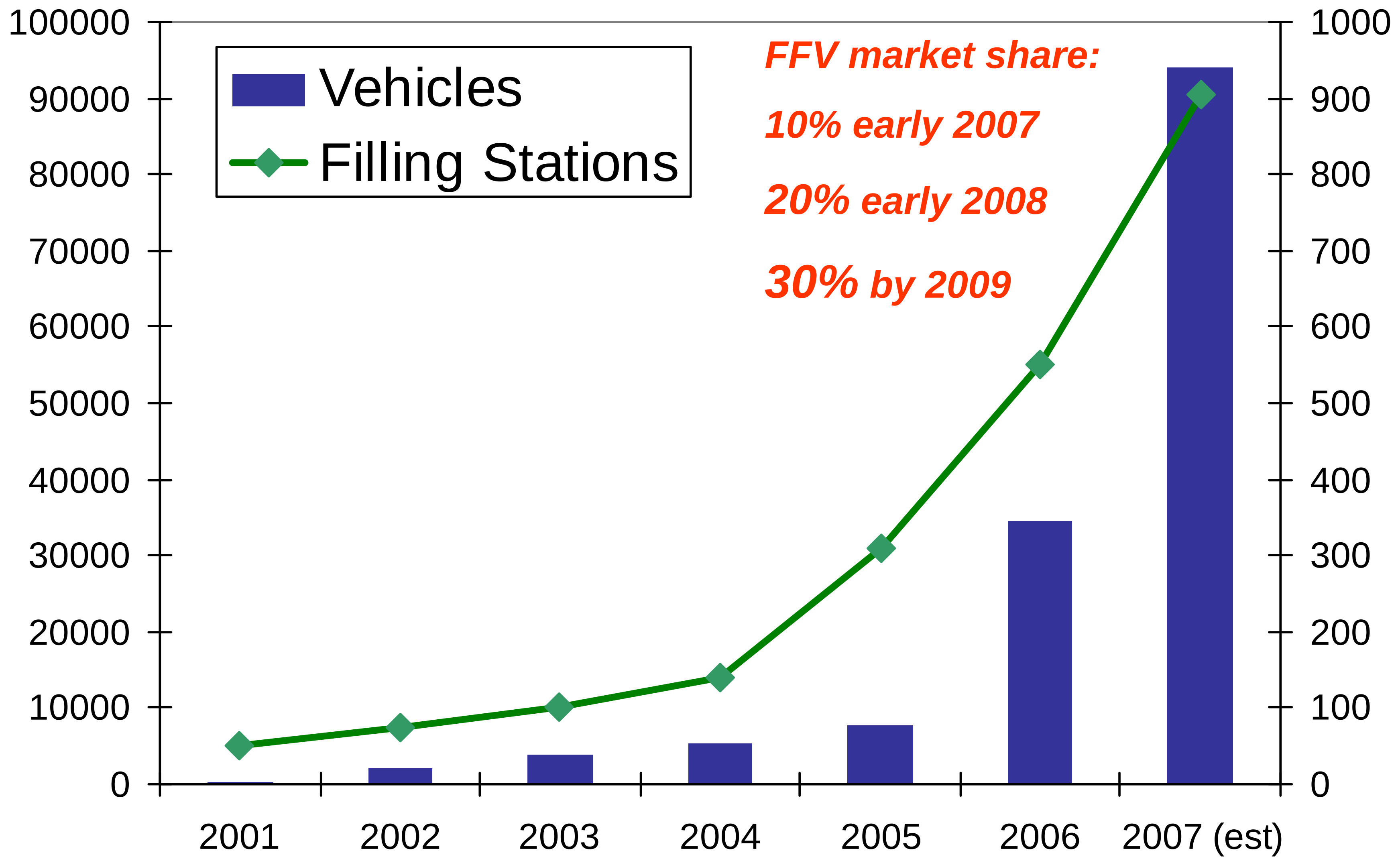
City Congestion Charging FFV exempt from Stockholm, 5 years

E85 Infrastructure Alternative fuel mandatory for all large filling stations by 2009CY (->60%) 883 Filling Stations (May'07)

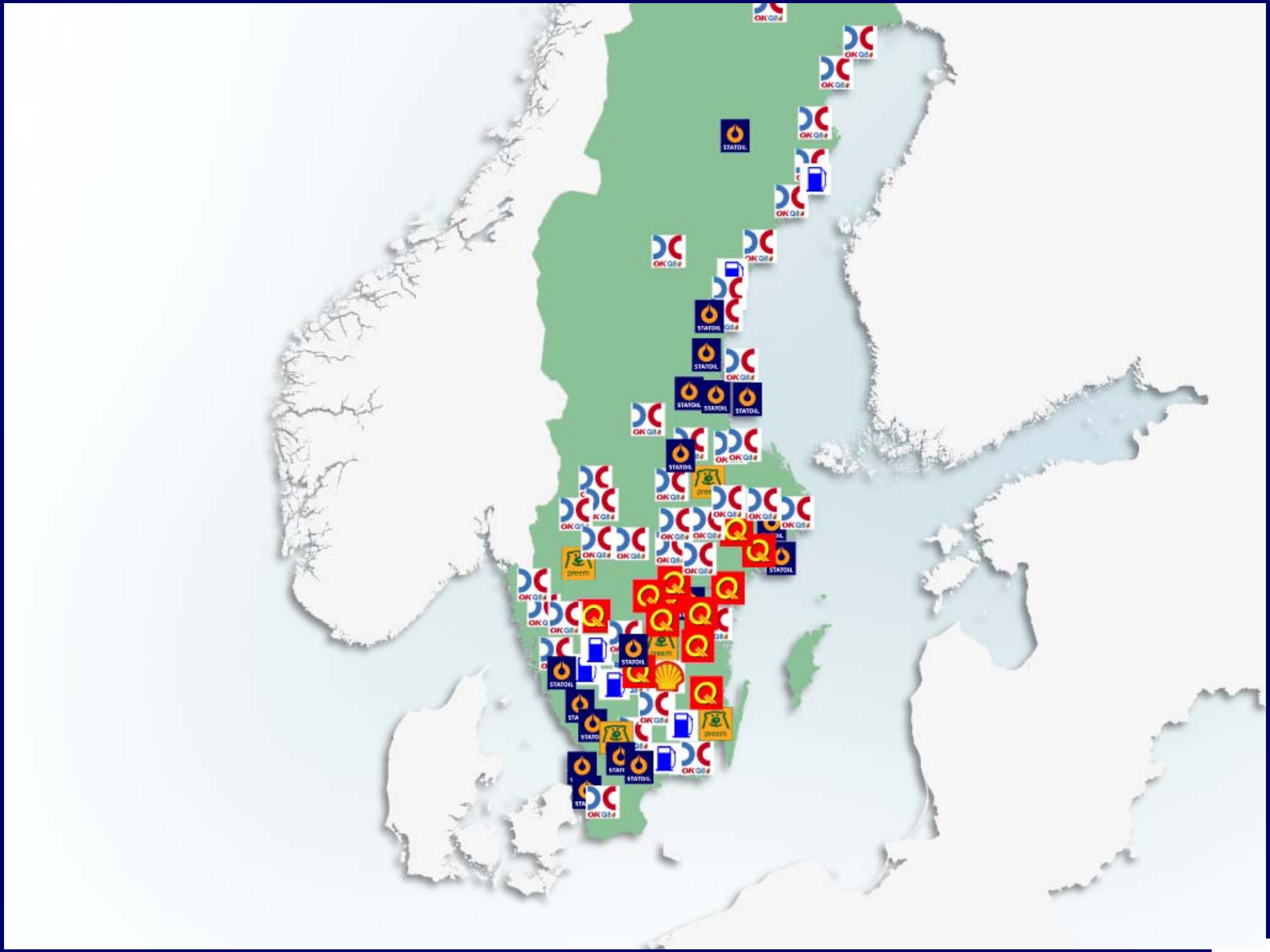
Procurement 35% of all public vehicles to be environmentally friendly (85% of new buy or lease)

Other incentives 10,000 Sek reward to private buyers of EEVs

FFV Market Development - Sweden



E85 filling stations in Sweden: 883 06/2007



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Percentage of Ford Focus sales in Sweden that are FFV: 80 – 85%

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Who controls Swedish market incentives?

- ✓ Vehicle price (Car Manufacturer and **Gov't** controlled)
- ✓ Company Car Tax (**Gov't** controlled)
- ✓ Circulation taxes (VED) (**Gov't** controlled)
- ✓ Congestion charge (Local **Gov't** controlled)
- ✓ Insurance costs (Insurance industry controlled)
- ✓ Fuel infrastructure (**Govt** and Fuel Retailers controlled)
- ✓ **Fuel Price (Gov't** controlled**)** ***– biggest single issue due to reduced energy density of ethanol***

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UK E85 – Example of insufficient government intervention

- Fuel duty: 20p per litre reduction ***– does not offset fuel consumption increase***
  - – Company car tax: 2% discount
  - – Annual road tax: £10 (approx 6%) lower for FFVs. Increase to £20
  - – Congestion charge: E85 not exempted

- ***Net result: UK FFV market stalled***

Developing biofuel markets – fuel quality

- Existing vehicle owners need to be able to source appropriate fuels
- New vehicles suitable for new fuels should be encouraged at same time as fuels
- Fuel quality should address biofuel introduction
- Need to avoid discrediting biofuel market (e.g. Australia example) by inappropriate quality or concentration

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Biofuel quality vs content

- Biofuels used for low blends may be more tolerant of contamination than high blends.
- Other blends may have different requirements
- Local conditions may affect blend requirements
  - Examples:

e.g. Chloride in ethanol:

1 mg/kg max allowed in finished fuel.

= 20 mg/kg max in ethanol used for 5% blend

Or

= 1.1 mg/kg max in ethanol for 85% blend

Potential for wrong choice of ethanol quality

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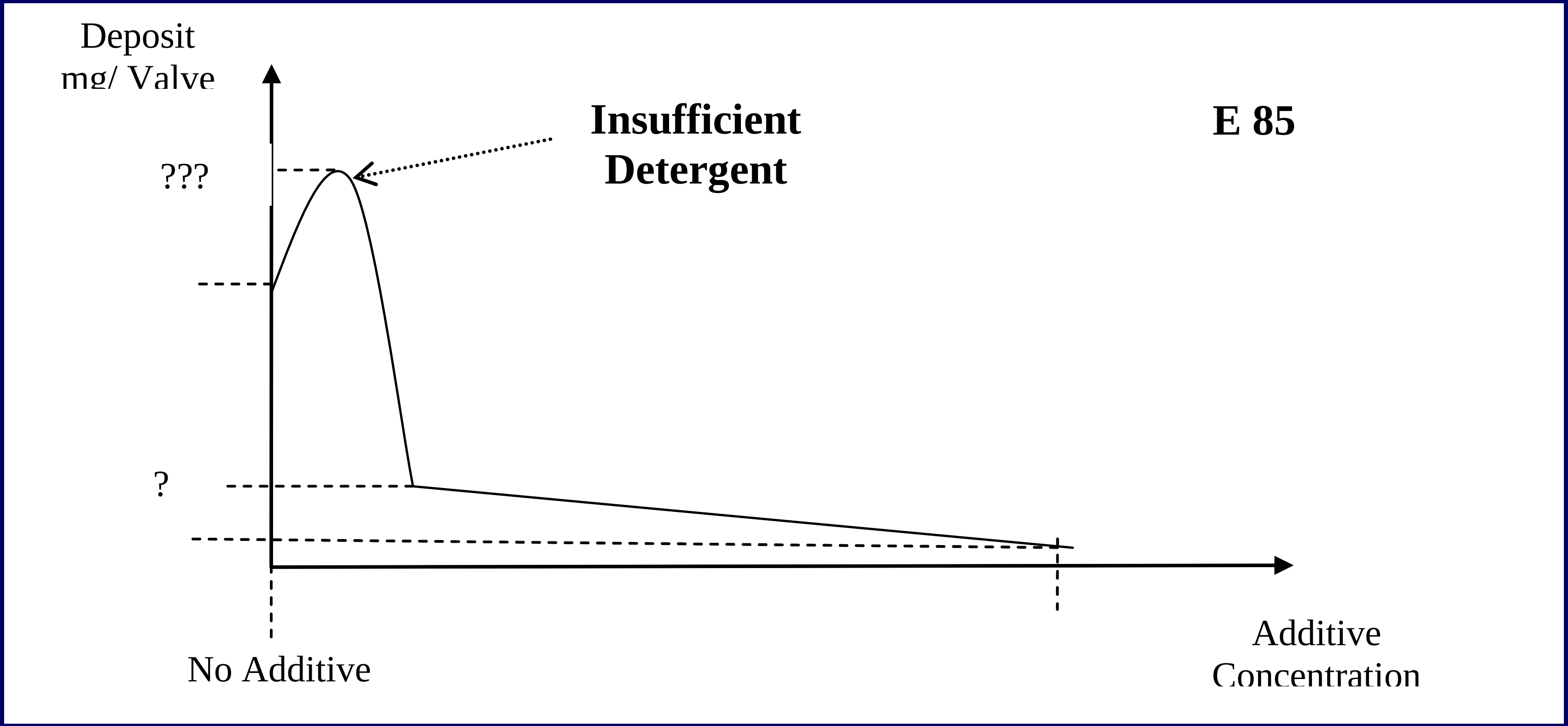
e.g. Detergent Additives in E85



E85 based on additised petrol will contain a small amount of additive - likely to be the worst case for intake valve deposits unless supplemented.

Key Messages

- Biofuel markets cannot and will not develop without government support
- Significant volumes of biofuels can be used within 'regular' fuels
- Fuel quality must support vehicles – legacy vehicles may not be capable of using bioblends, so likely to require (at least) 2 grades:
  - Low content grade for old vehicles
  - High content grade for new vehicles

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