Biobutanol
Unlocking our Existing Potential

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SAE®

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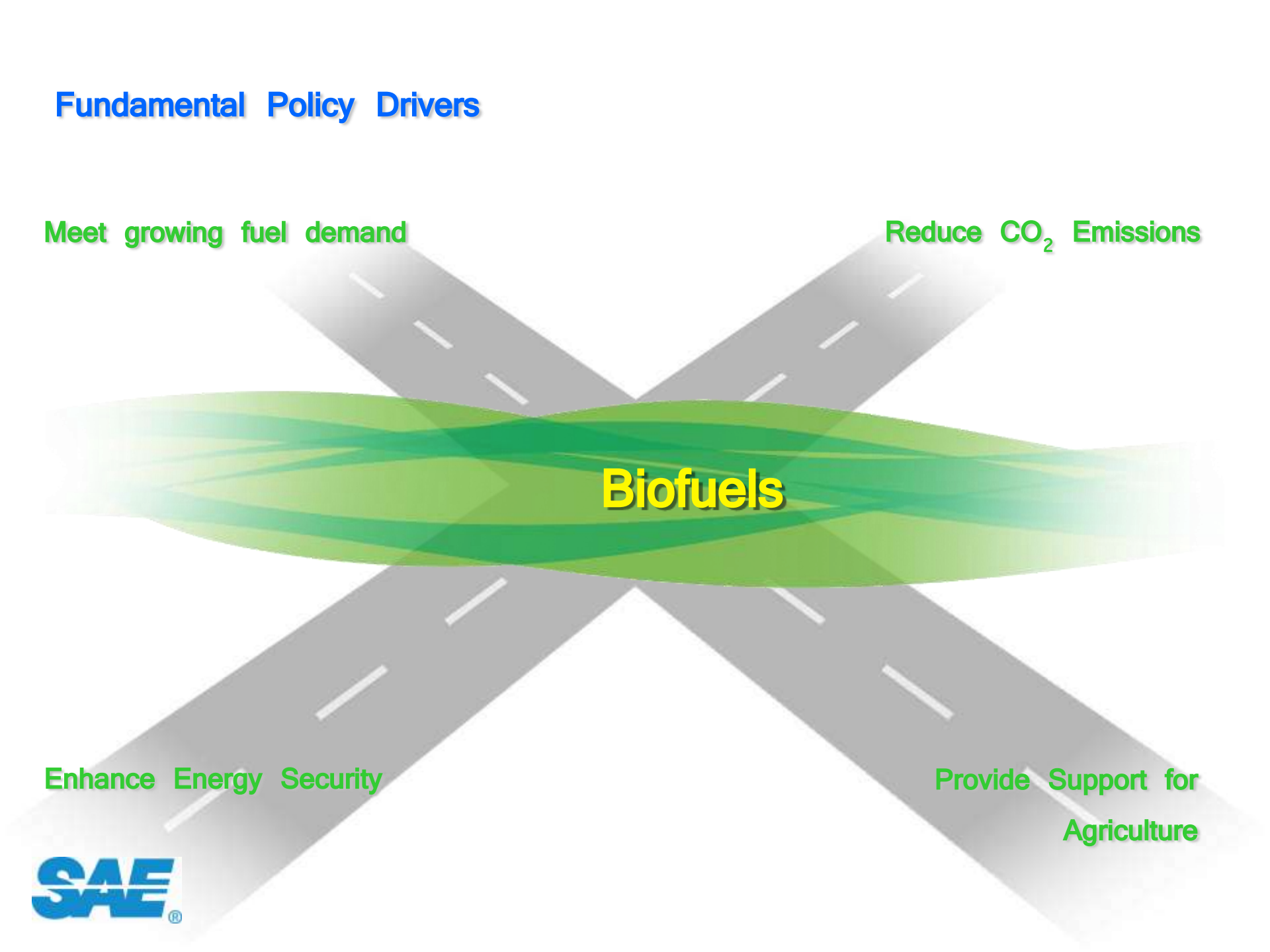
A joint venture between BP and DuPont

Fundamental Policy Drivers

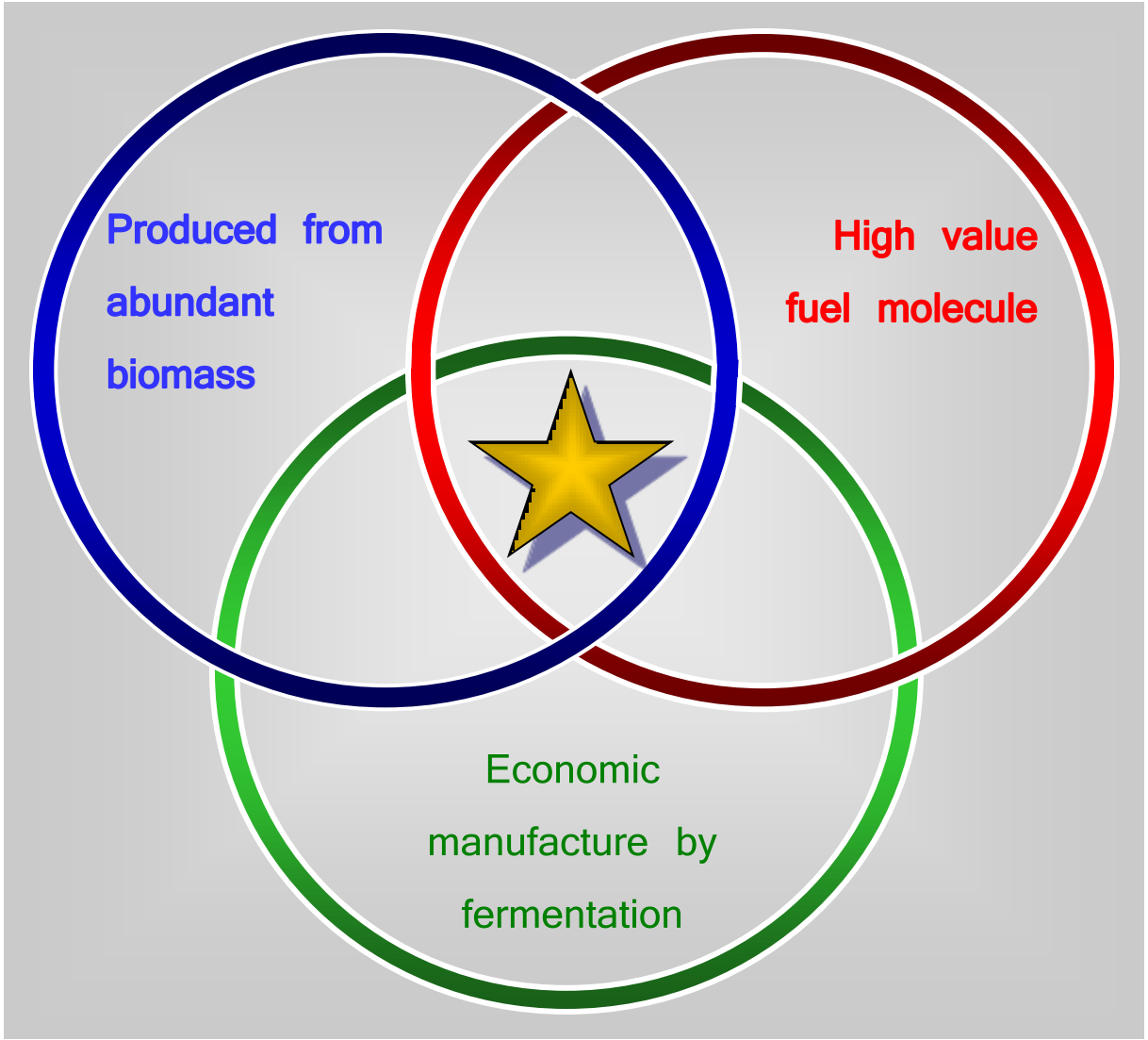


Biofuels are a preferred Alternative Fuel

- Because
  - They can be produced at scale
  - They can be produced economically
  - They can be used (to some limit) with **existing vehicles and infrastructure**

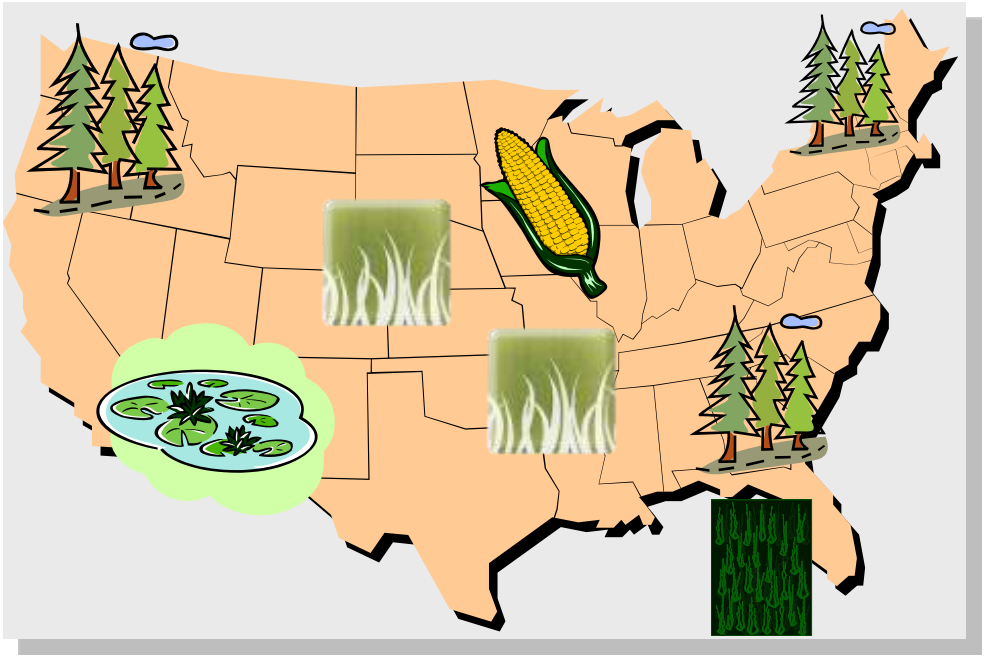
How do we accelerate delivery of the benefits of biofuels?

What does it take?



Produced from abundant biomass

- Production from current feedstocks enables **rapid scale-up**
- Production from current feedstocks enables early investors to participate in future growth
- Extension to additional feedstocks enables **greater scale** and expands **geographic range**
- Use of increasingly sustainable feedstocks enables the footprint to shrink as production grows



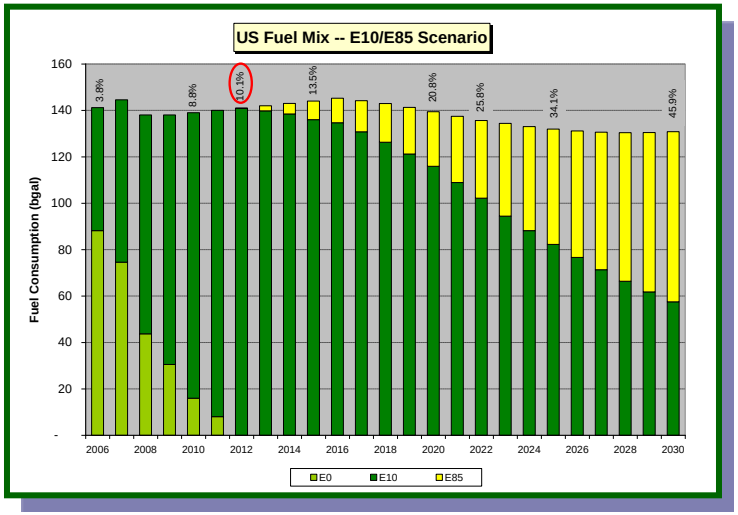
Economic manufacture by fermentation

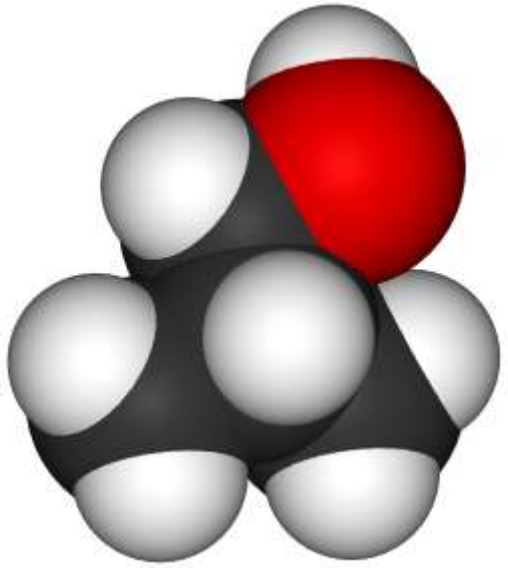
- Fermentation pathways
  - Are suitable for the wide variety of **abundant feedstocks** which can yield fermentable sugars
  - Are generally low temperature, low pressure and relatively low hazard operations
  - Can be reasonably adapted to produce **new molecules** with advances in biocatalysts

- Fermentation pathways offer
  - A large existing asset base which enables more **rapid technology adoption**
  - A large base of industrial experience and expertise which enables new technologies to be introduced at reduced risk

High value fuel molecule

- Taking biofuels penetration to the next level will be enabled by moving from regulatory push to **demand pull**
- **Biobutanol** enables growth of today's ethanol industry – and tomorrow's
  - Utilize the **same** range of **feedstocks**
  - Modest retrofit of **existing ethanol assets**
  - **Policy objectives accelerated** with 16% biobutanol
    - GHG benefits of E20 while providing consumers the same fuel economy as E10
    - Blended at refineries, transported via existing product pipelines, dispensed through existing retail hardware and consumed by existing vehicles
  - Refining value enhanced by high octane, **low RVP** and favorable distillation
  - Environmental, Health and Safety characteristics comparable to ethanol





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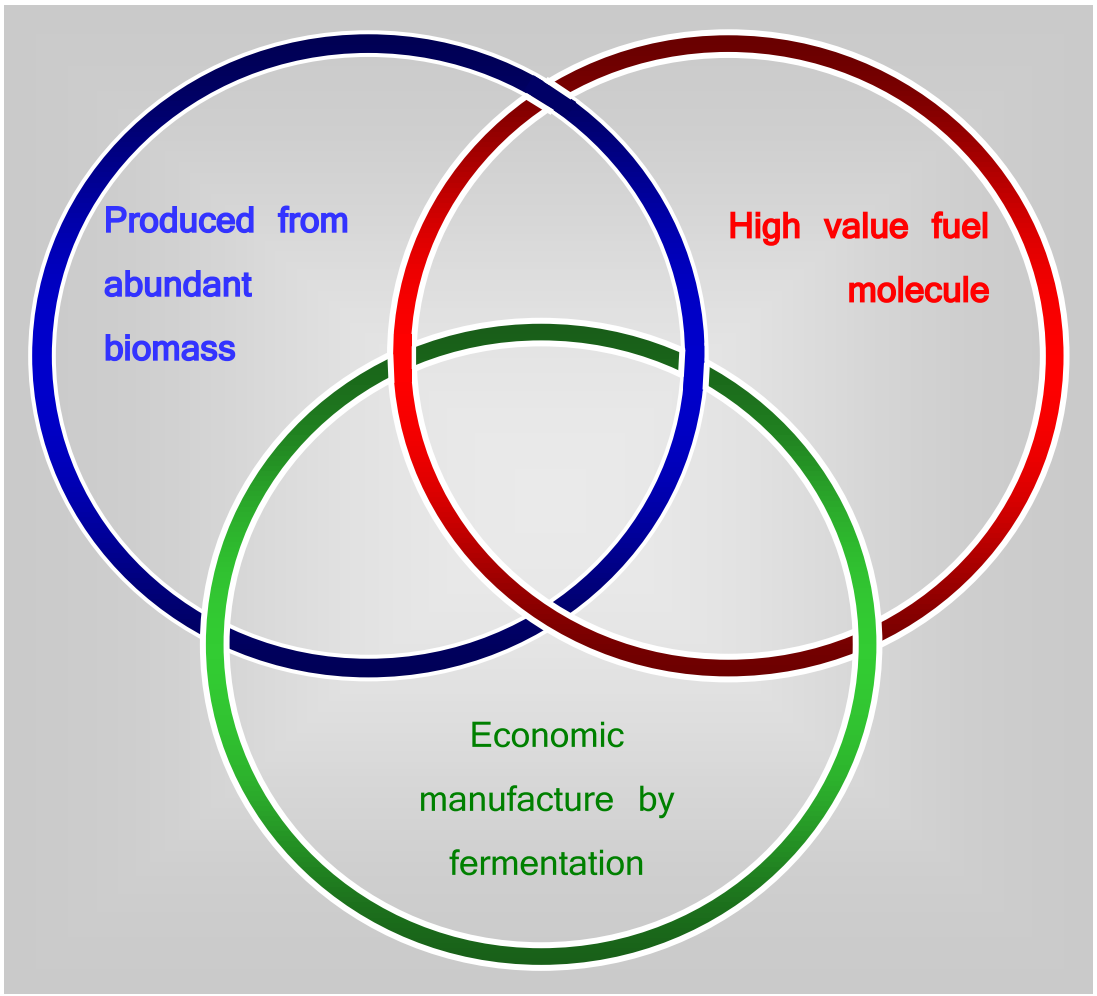
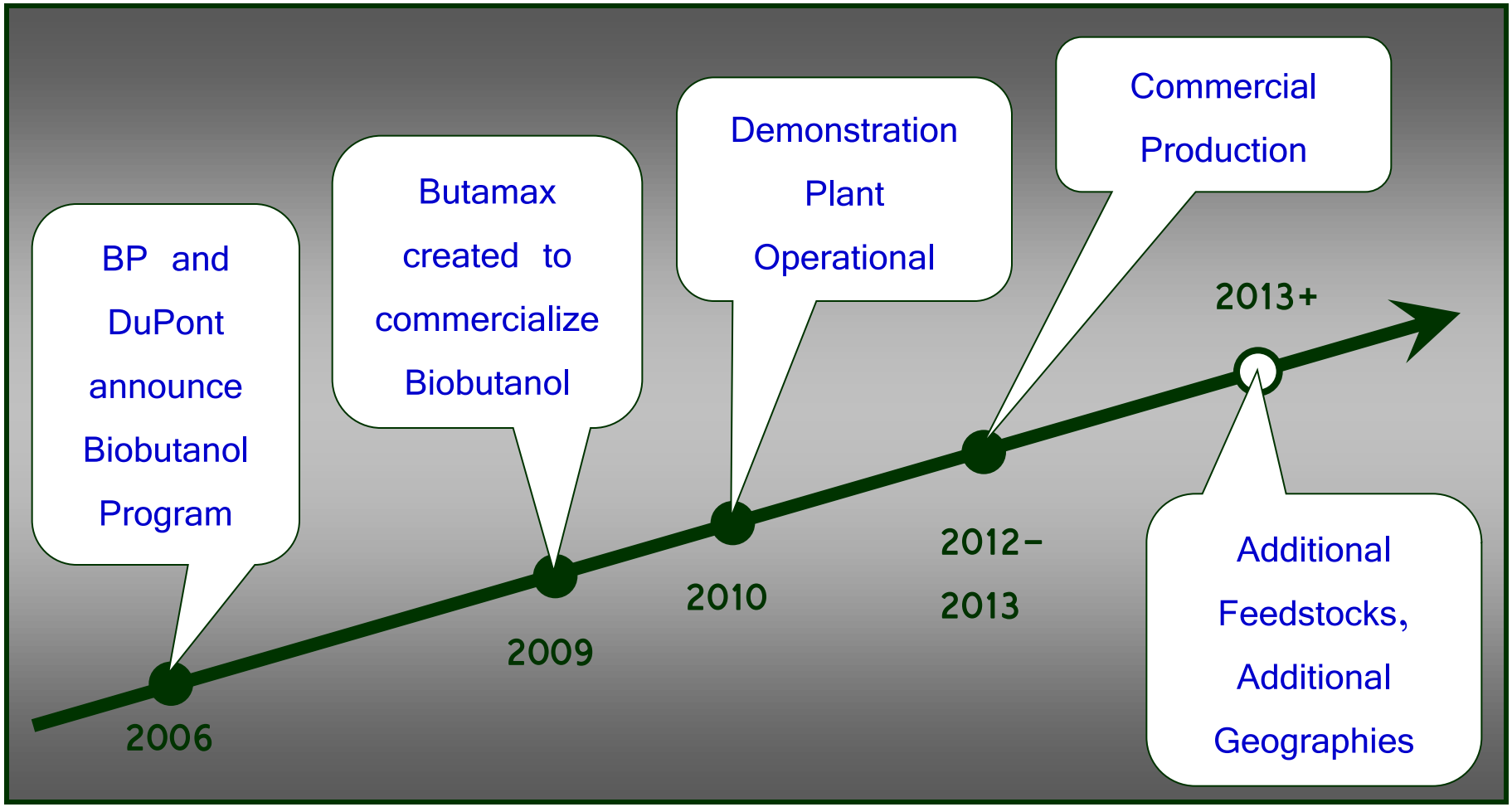


Molecules with excellent fuel properties

– and –

Production from fermentable sugars

Timeline to Commerciality



What does Biobutanol offer?

Group		Benefit
Growers	✓	Secure and growing markets for their production
Producers	✓	Produce a more valuable product from existing investment; Enable future growth of the biofuels Industry
Investors	✓	Reduce risk by enabling a growing biofuels market
Policy Makers	✓	Enable more rapid delivery of key policy objectives
Consumers	✓	Economic fuels which perform well in their vehicles
OEMs	✓	Biofuels growth achieved through blends compatible with existing engines and vehicles
Retailers	✓	Preserves their existing investment by enabling biofuel requirements to be met with a more compatible fuel
Refiners	✓	Ability to comply with growing biofuel obligations with a high-octane, low RVP component with high blending value

Biobutanol unlocks our existing potential

- Biobutanol is produced from the feedstocks we already grow and process
  - *And can be extended to the feedstocks of the future unlocked by technology under development*
- Biobutanol is manufactured with well-understood technology at assets that already exist
  - *And can be built into greenfield assets as they are built*
- Biobutanol enables increased biofuels demand
  - *And further upside is available in future vehicles*

…and establishes a platform for the future