Growing Global Ethanol Use

Four factors driving production, consumption, and trade

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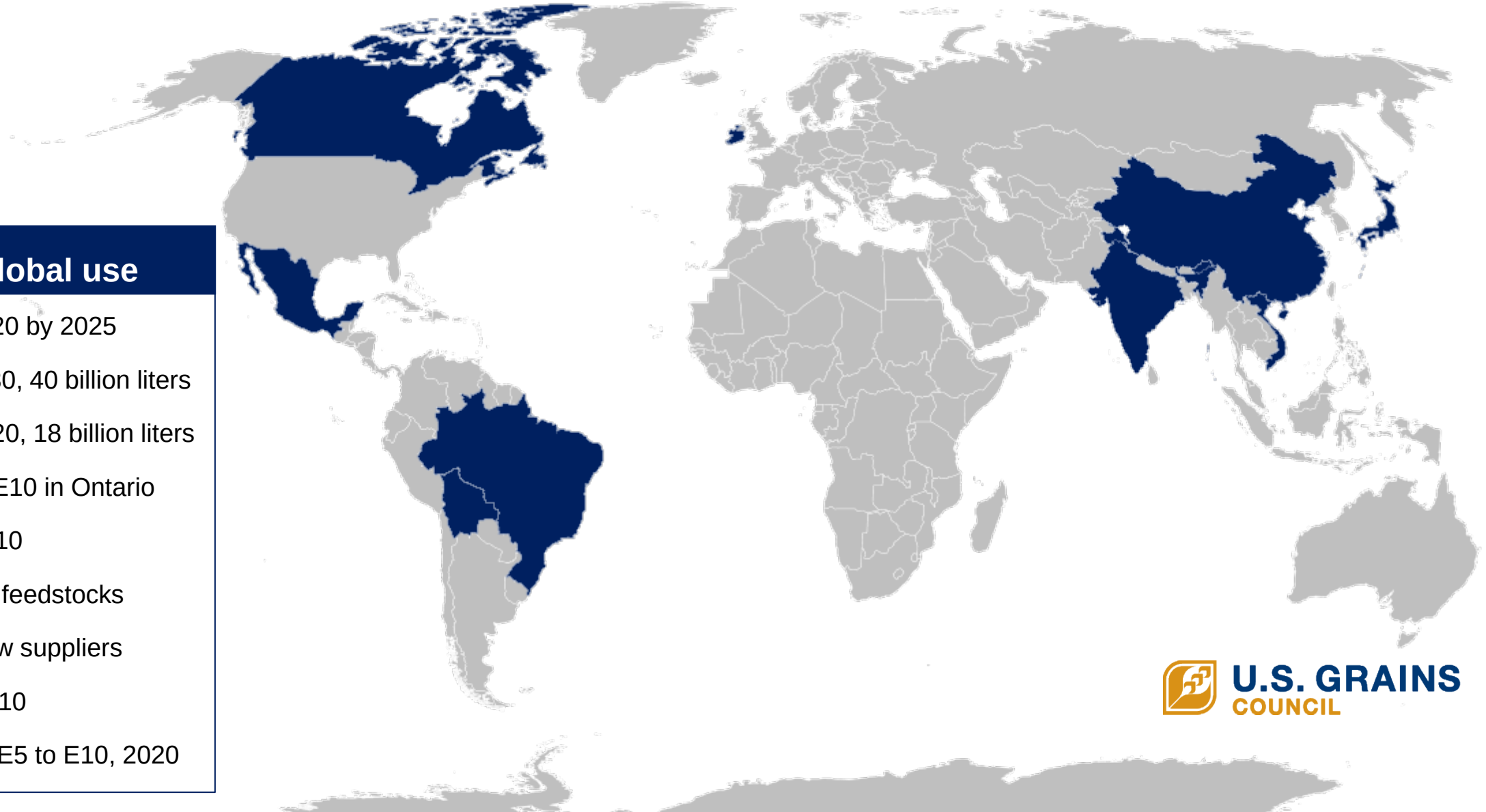
More than 60 countries have biofuels policies in place. In the last year, 9 have announced significant expansions to their policies.



Expanding global use

- Bolivia – E20 by 2025
- Brazil – 2030, 40 billion liters
- China – 2020, 18 billion liters
- Canada – E10 in Ontario
- Ireland – E10
- India – new feedstocks
- Japan – new suppliers
- Mexico – E10
- Vietnam – E5 to E10, 2020

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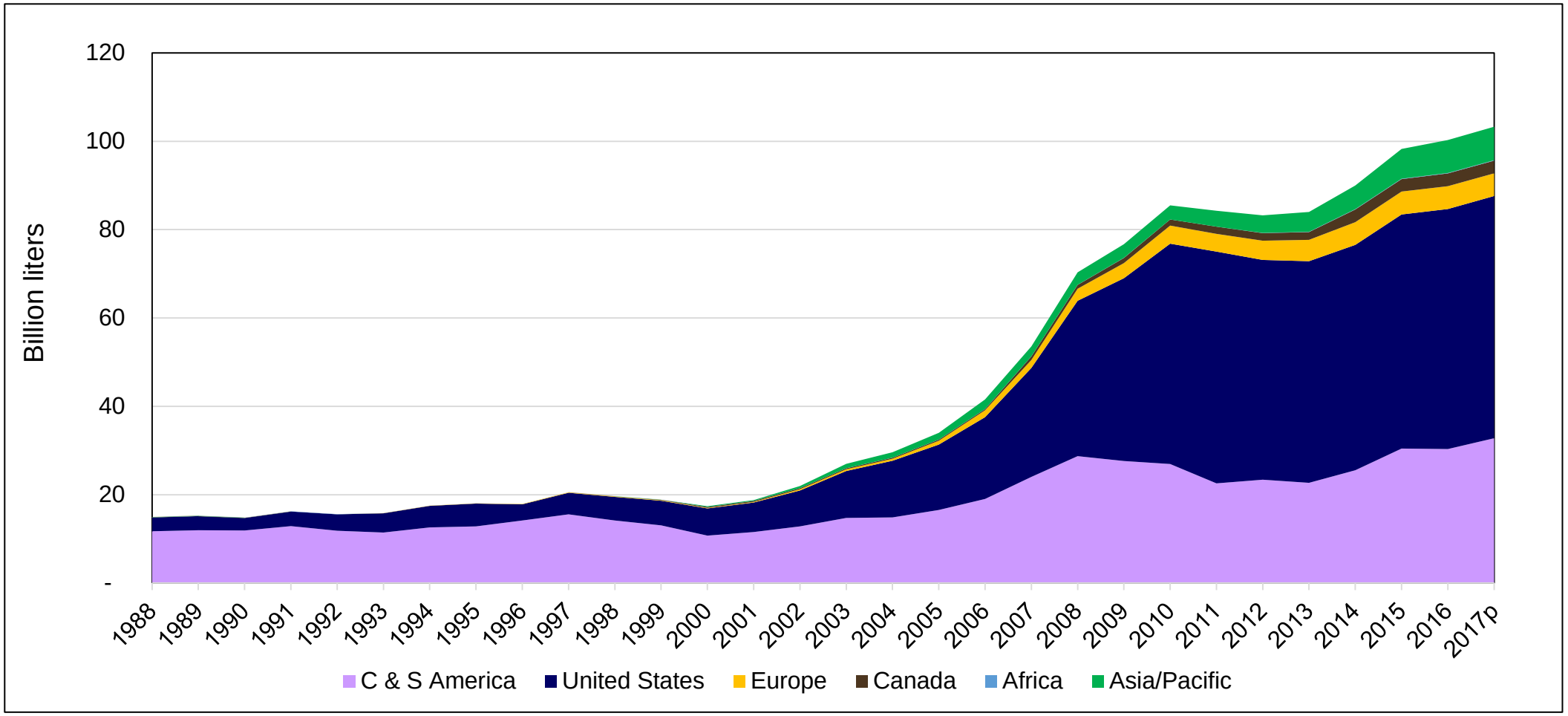
Global production has surpassed 100 billion liters, and is expanding



Source: U.S. Energy Information Administration & USDA/FAS Office of Global Analysis Projections

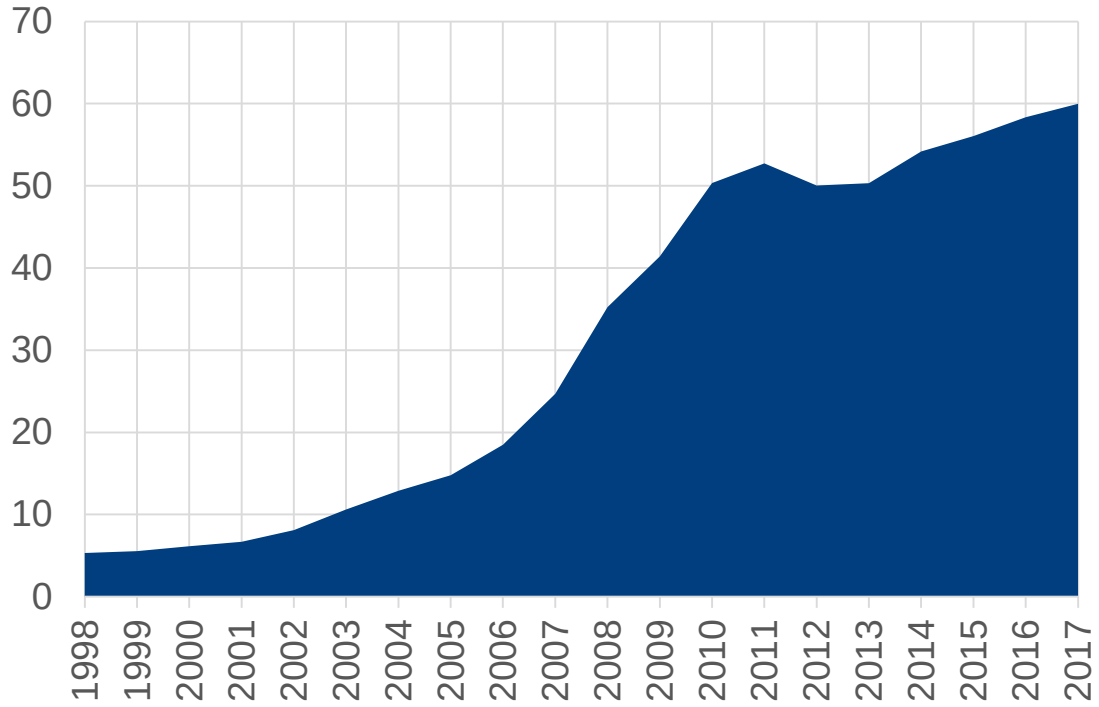
Factors driving the expanded use of ethanol

A combination of four factors will continue to drive the use of ethanol and the development of new or expanded ethanol policies globally

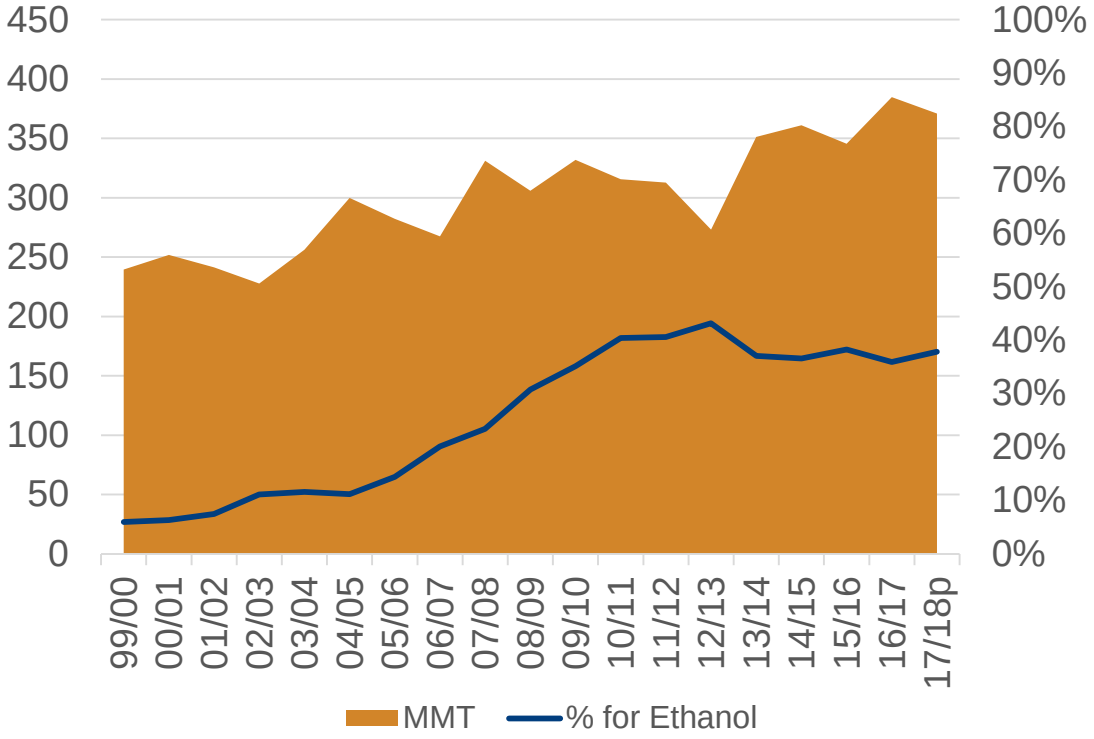
Four factors driving global ethanol policies	
Agricultural producers and complementary industries	Feedstocks are the major (75%) component of production, boosting rural economy, and storage, R&D, infrastructure networks
Environmental benefits	COP21 – Paris Agreement commitments to overall GHG emissions reductions
Human health benefits	Improving air quality and reducing particulate matter emissions
Economics and profitability	Octane economics – cost competitive against aromatics, with benefits to consumers & a boost to company profitability

U.S. renewable fuel standard drives ethanol use, nearly 40% corn utilization

U.S. ethanol production – 60 billion liters



U.S. forecast corn production – 371 MMT, 38% destined for ethanol production



Sources: USDA Economic Research Service, USDA Foreign Agricultural Service PS&D

Environmental and human health benefits

Vehicle ownership set to surge boosting fuel demand & GHG emissions, creating opportunities for expansion of ethanol use

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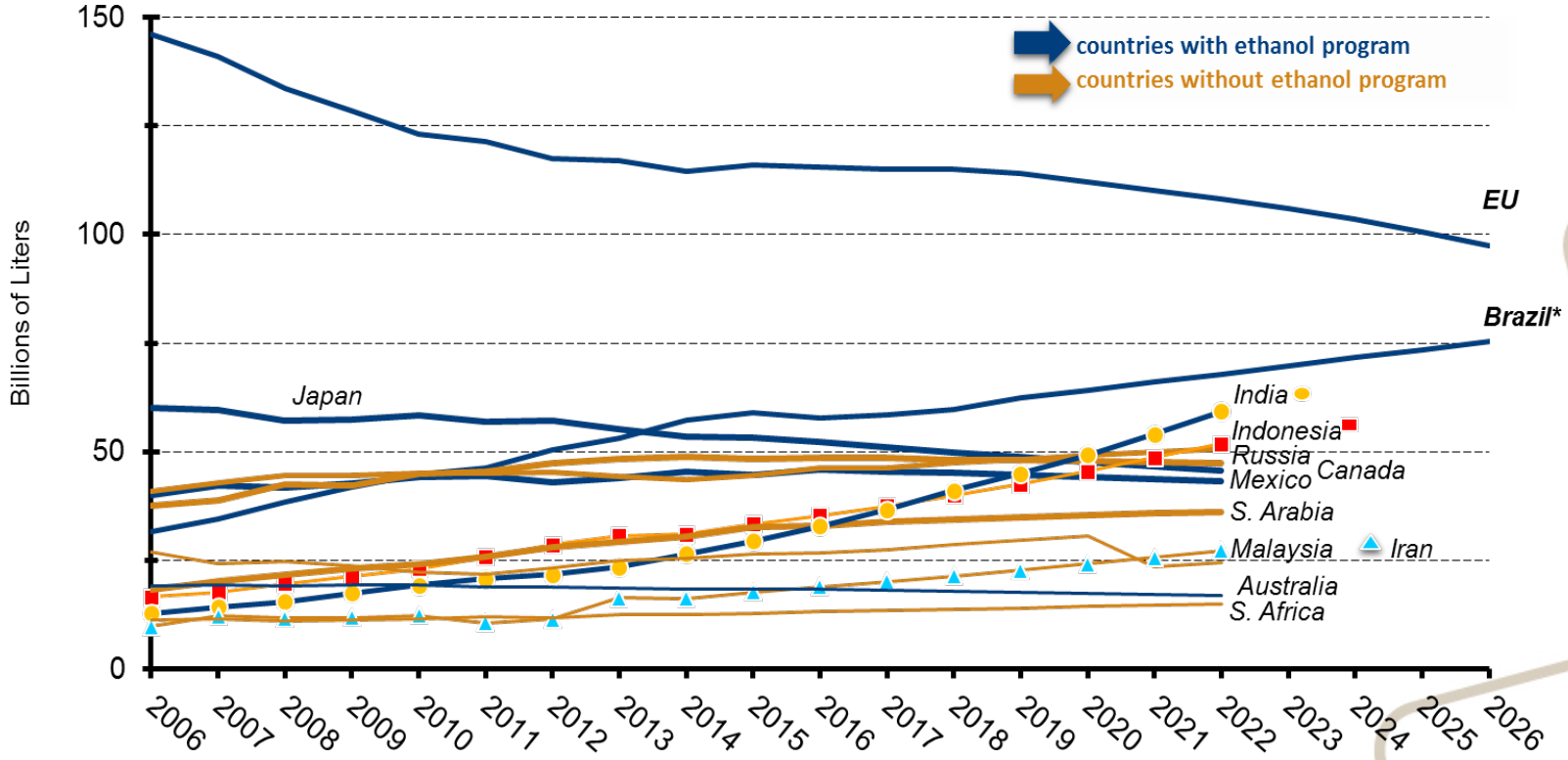
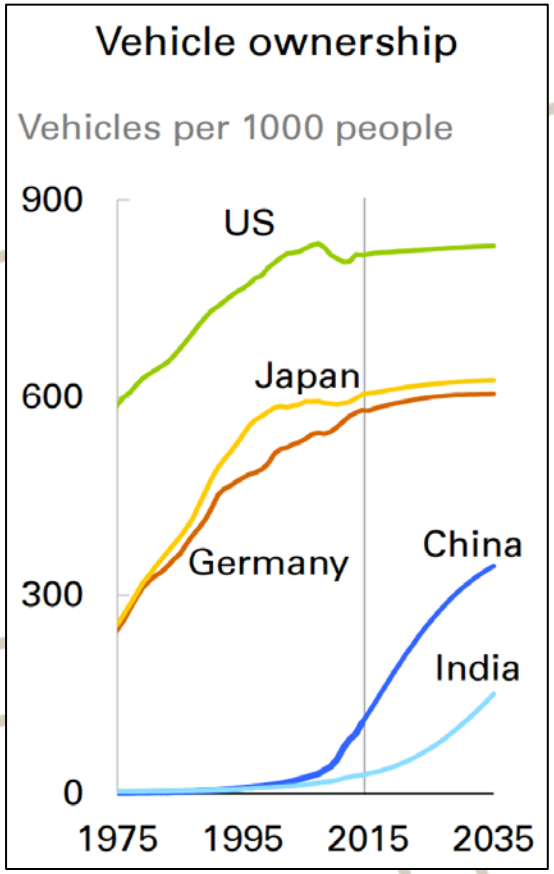
Top 15 Largest Gasoline Markets
(excluding United States, 545 billion liters and China, 190 billion liters – in 2018)





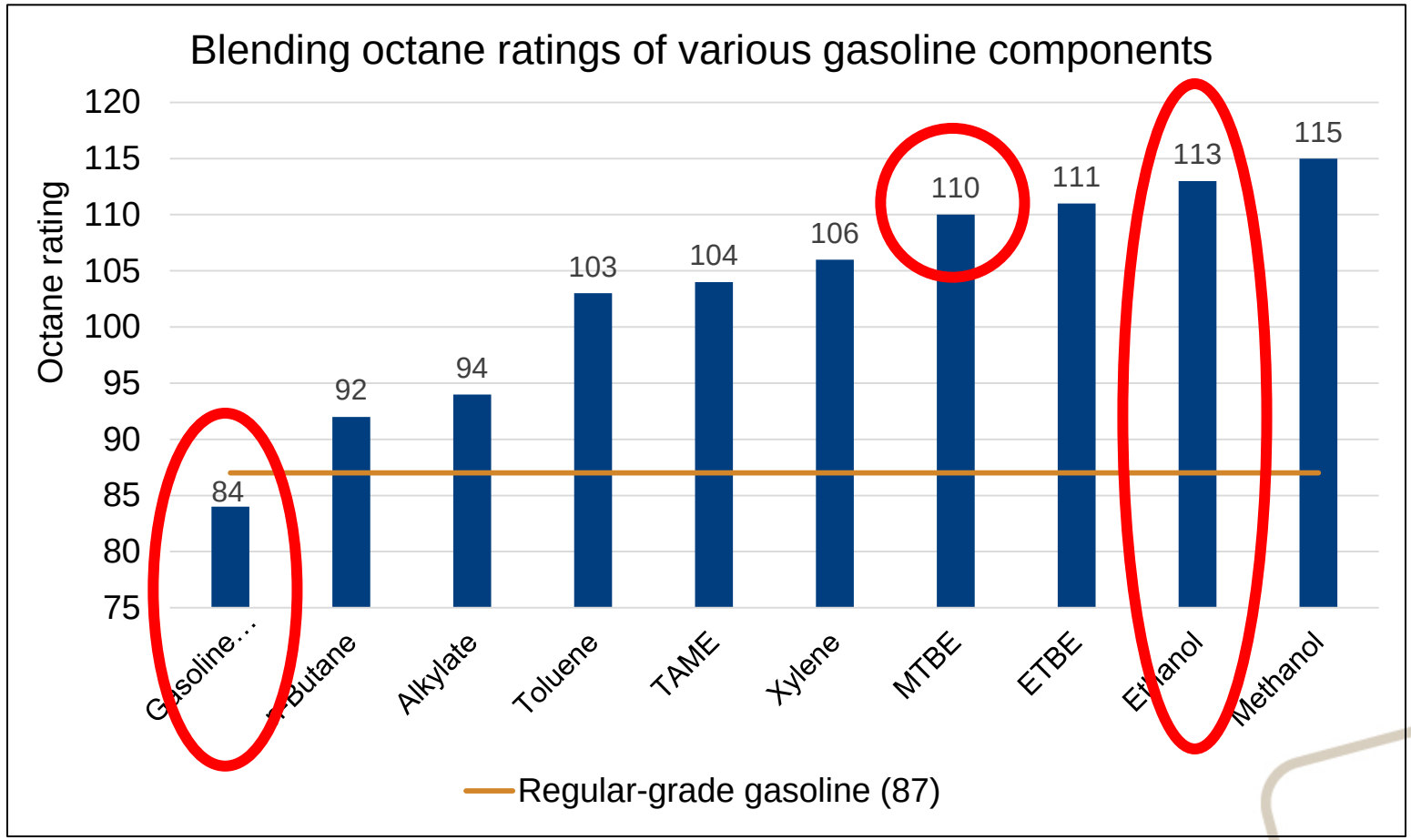
Note: * Includes Gasoline C (which included anhydrous) plus hydrous.
Source: Int'l Energy Agency (IEA), Paris ; 2017 Projections thru 2022 based on Brent $61.5/bbl by 2022; extended to 2026 by OECD biofuels staff.

Countries are focused on meeting Paris Agreement Commitments or own country contributions to overall GHG emissions reductions

- Focus on the transport sector
- Co-products support GHG emissions reductions
- According to USDA, U.S. corn ethanol reduces emissions by 43% over conventional gasoline, expected to exceed 50% by 2022. Many individual plants already above 55% GHG reductions
  - Japan

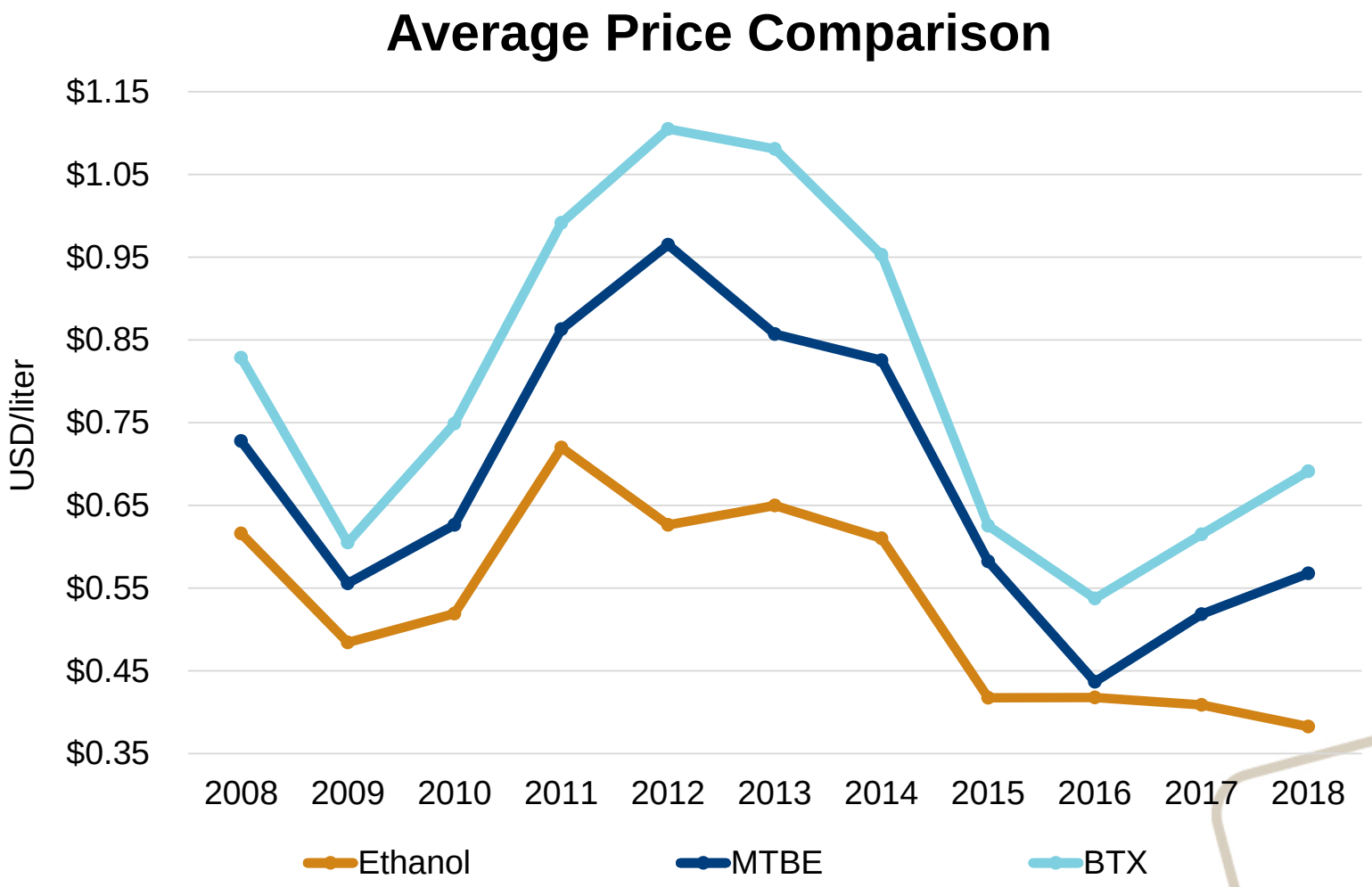
Economics and profitability

High octane rating and low cost make ethanol an attractive oxygenate of choice for Korea



Source: U.S. Department of Energy and ethanol industry

Ethanol is cheapest source of octane over the last decade, holding significant economic advantages



Source: U.S. Grains Council

Outlook for use and trade

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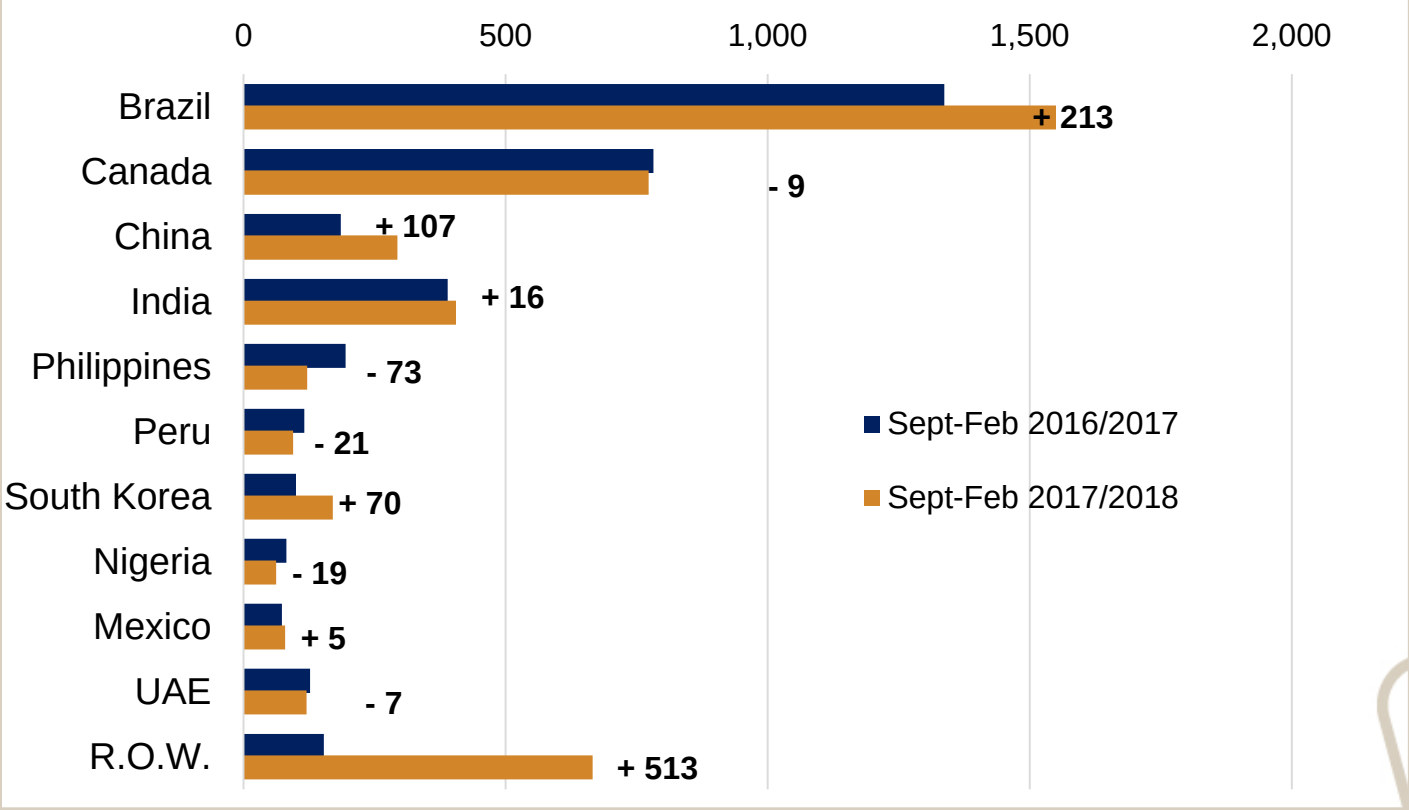
Outlook for use and trade

U.S. exports are coming off a record year, 5.2 billion liters in MY2016/17

U.S. ethanol exports – 4.3 billion liters, through Apr. 2018

millions of liters



Source: Global Agricultural Trade System, *U.S. Grains Council Forecast

In global trade, major producers and exporters are also importers (MY2016/17)

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Major exporters – countries with sufficient feedstock

- United States – 5.2 bln liters
  - Brazil, Canada, India, Philippines, South Korea
- Brazil – 1.4 bln liters
  - U.S., South Korea, Japan, EU
- Pakistan – 450 mln liters
  - Japan, South Korea, EU, Taiwan
- India – 140 mln liters

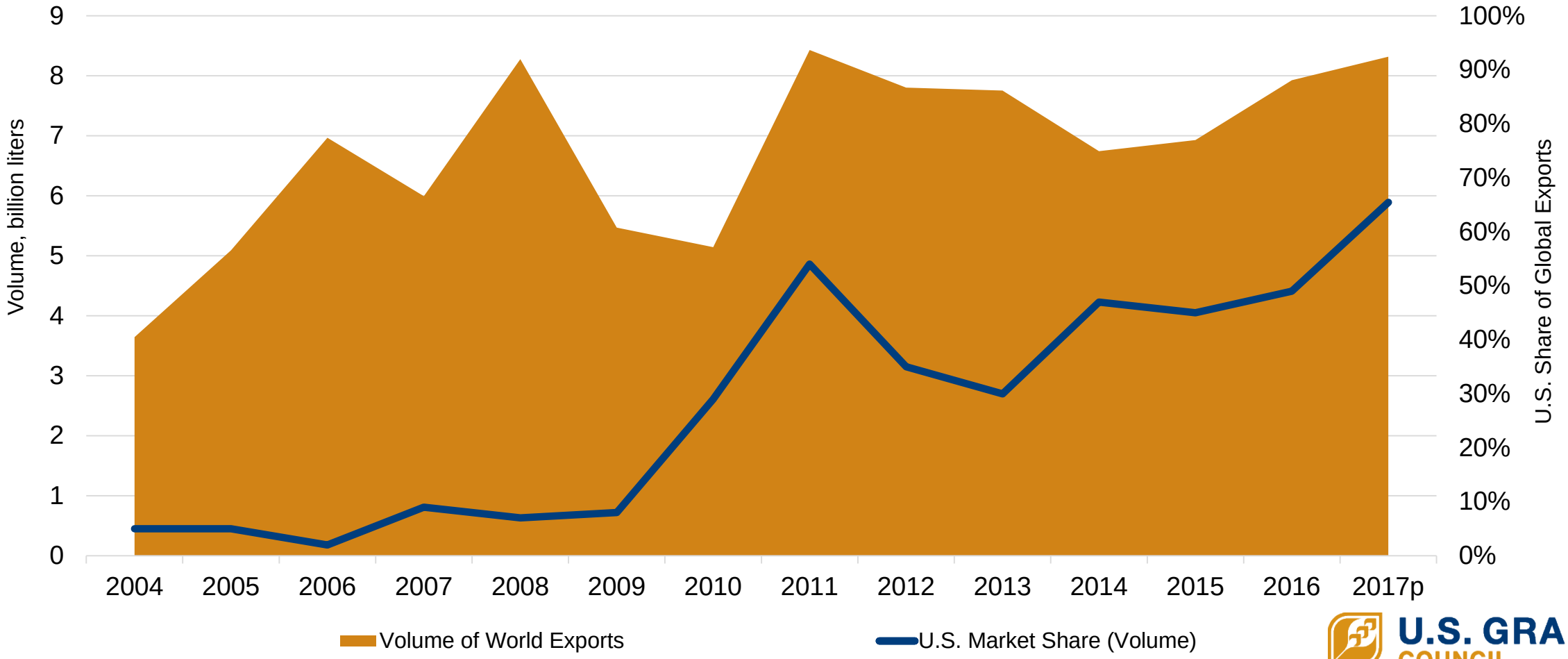
Major importers – policies with a role for trade

- Brazil
- Canada
- United States
- Japan
- Philippines
- India

Outlook for use and trade

2017 Global ethanol trade reaches 8.3 billion liters

U.S. share of world exports expands to 65%



Source: Global Agricultural Trade System (UN Trade Data subset) and Global Trade Atlas, U.S. Grains Council – projections (p)

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Prospects For Growth

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Major markets

- Brazil
- Canada
- China
- India
- Japan
- Mexico

Tier-two markets

- Colombia
- Korea
- Philippines
- Peru
- Taiwan
- EU
- Vietnam

New potential

- African markets
- Persian Gulf
- Indonesia
- Turkey
- Regional Summits
- APEC

Partnerships in global market development

The U.S. ethanol industry is building global biofuels partnerships with interested countries to avoid false starts in policy development and to share best practices in expanding the global use of ethanol

- **Working directly with other countries (industry and government)** to develop proven policy supports, including enforced blending mandates and/or tax incentives.
- **Highlight the benefits to society** that result from biofuels blending – GHG emissions reductions, air quality improvements, improved engine performance (octane advantages), and energy diversification. Also, rural economic development for those countries with competitively priced feedstock.
- **The positive role of trade** – imports can help reach blending targets if domestic production lags or does not exist.

- Assistance offered through joint bilateral working groups, trade missions, reverse trade missions, and technical and policy workshop

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Conclusion

- Three of the four factors stand to benefit Korea in developing ethanol policy and use
  - Environmental benefits
  - Human health benefits
  - Consumers and profitability
- U.S. industry and government stand ready to support Korea in developing a policy with a role for trade
- E10 is a starting point for new policies

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