

# The Role of Biofuels in a Regional LCFS

# Industry Perspective on LCFS Policies

- The ethanol industry supports performance-based low carbon fuels policies built on sound science, defensible modeling, and consistent analytical boundaries.
- First- and second-generation ethanol technologies can play a major role in accomplishing the goals of low carbon fuels policies.

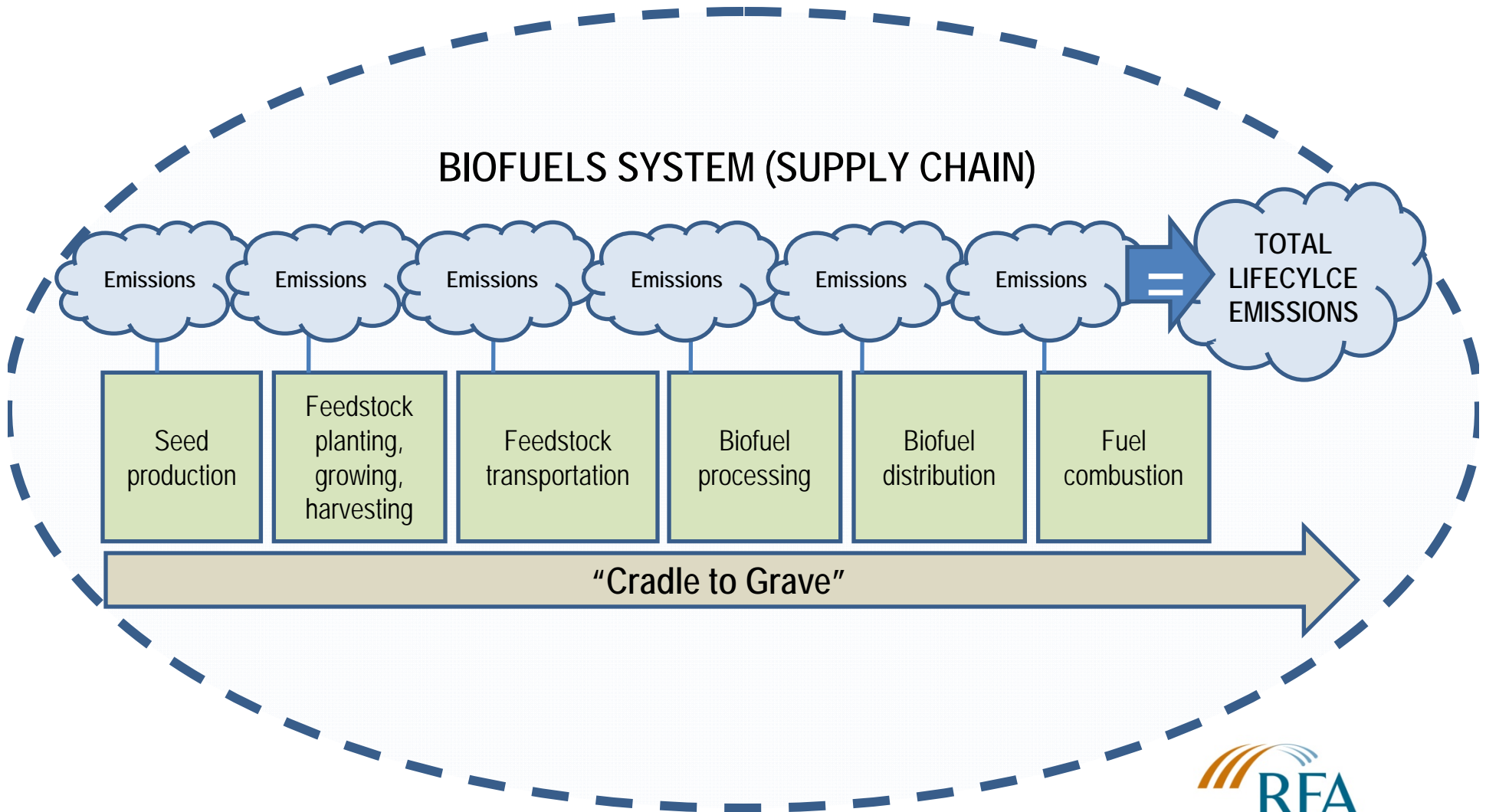
# Lifecycle Analysis is the Cornerstone of the LCFS Policy Structure

- Provides the uniform “measuring stick” for GHG analysis of all fuels
- Analysis of *direct* GHG emissions is data driven, relatively straightforward, and well-tested
  - GREET
  - BESS, GHGenius, LEM, EcoBalance (PWC), SimaPro
- Analysis of *indirect* GHG emissions is assumption driven and highly uncertain
  - No singular economic model is available for express purpose of analyzing indirect GHG effects

# Defining Analytical Boundaries

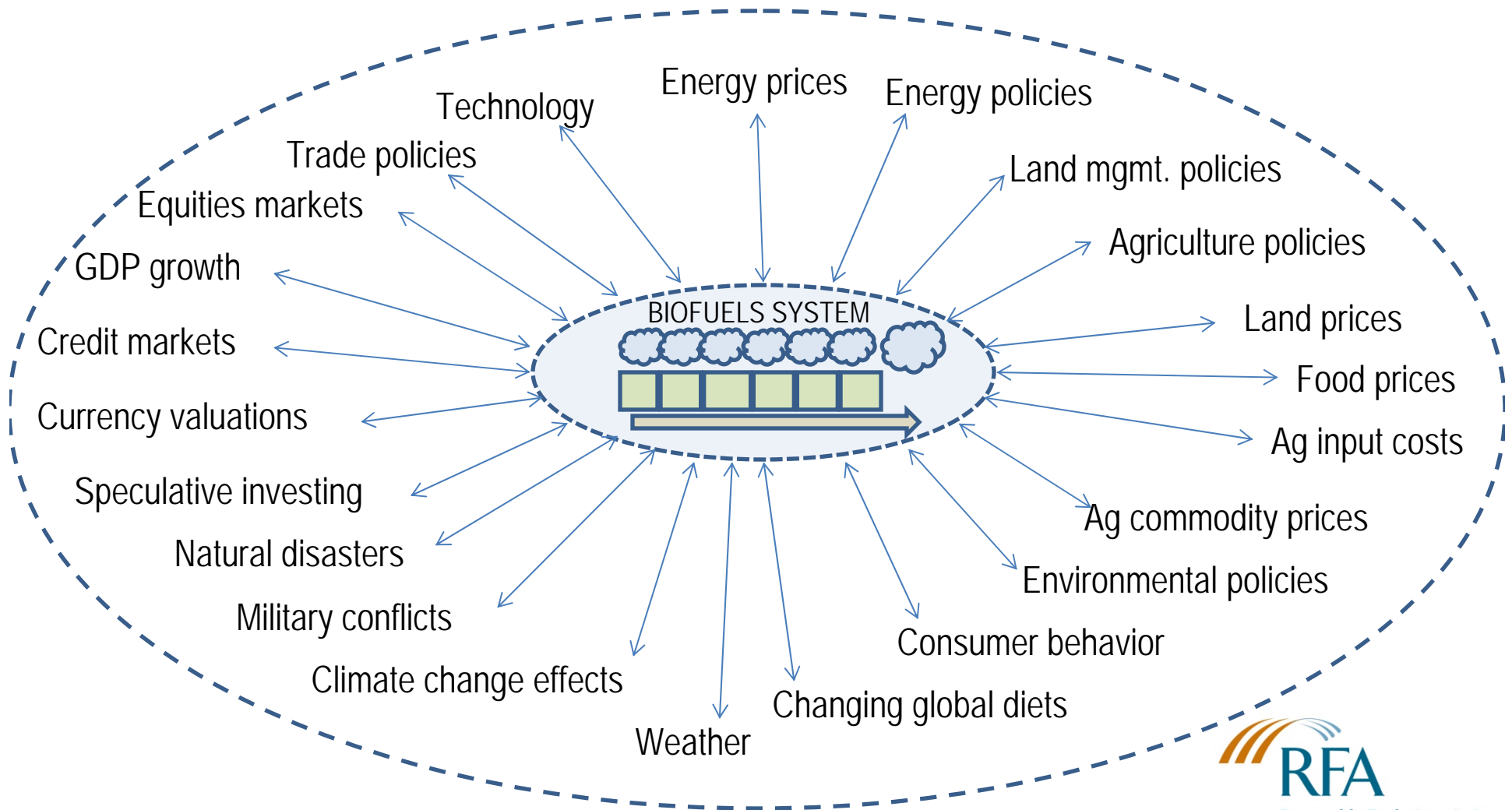
- GHG emissions related to supply chain
- GHGs from secondary, market-mediated impacts
- Geography (and treatment of “shuffling”)
- Treatment of marginal sources
- How to deal with externality costs (economic, social, environ.)

# Boundaries for Direct GHG Emissions



# Supply Chain Externalities

- These external factors “push” and “pull” on the system (direct supply chain) *and each other*
- “Indirect effects” are interactions between (and among) the direct supply chain & external factors



# System boundaries for LCA must be well-defined and consistently applied

- Every energy decision we make has secondary, indirect effects
- If indirect effects are included in lifecycle analysis, they must be considered for ***ALL*** fuels
- Indirect effects are often market- and/or policy-mediated, making modeling even more difficult
- *Indirect land use change is only one example of indirect, market-mediated impacts*

# Accounting for Other Biofuels Benefits

- Economic development/jobs
- Diversified supply of transportation fuels
- Reduce demand for petroleum imports
- Reduce farm payments/crop surpluses
- Reduction of non-GHG emissions/pollution

# Recommendations

- Be consistent in assigning LCA boundaries
- Allow science to catch up with policy direction
- Engage the right experts
  - LCFPs cut across a wide spectrum of disciplines
  - Agronomists, animal scientists, forestry experts, etc.
- Ensure a public process
  - Including availability of economic models
- Ensure harmonization with other policies
  - Avoid market confusion, inequities
- Don't rush the process

# RFA as a Resource

- Data, surveys, reports on biofuel production factors (fossil energy use, electricity, co-products, etc.)
- LUC analyses & GTAP modeling capability
- GREET modeling capability
- Analyses on timing of GHG emissions
- Reports on value and use of co-products
- Etc.
- Extensive network of biofuel producers, technology providers, farmers, analysts, academics, etc.