

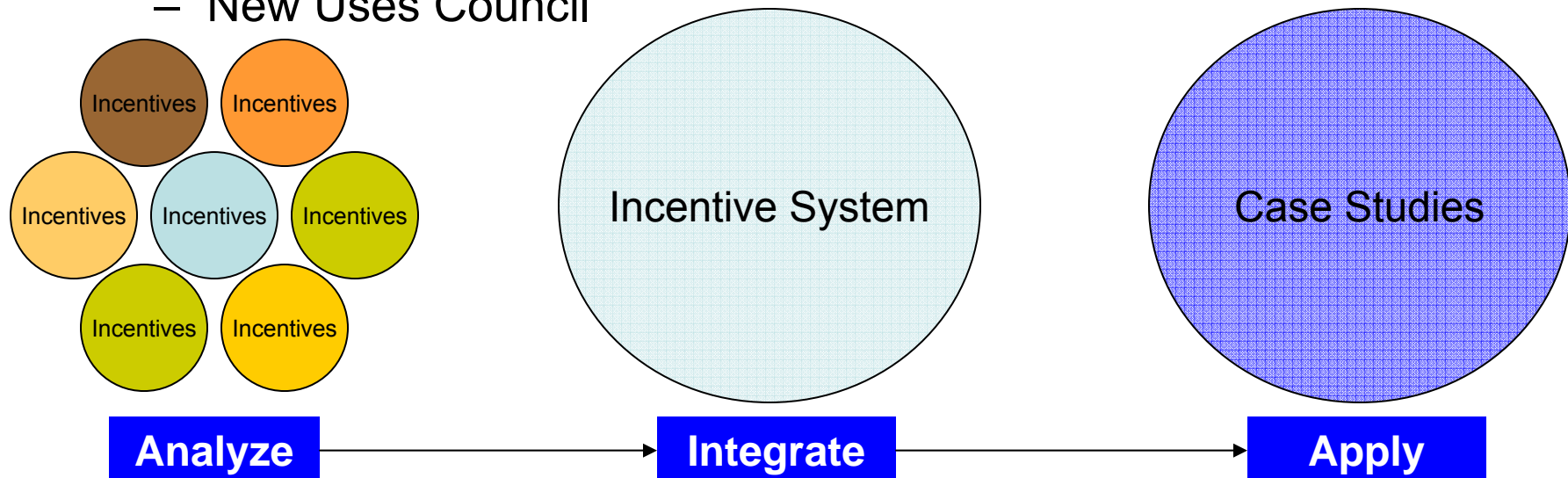
Development of Workable Incentive Systems for Biofuels, Biopower, and Biobased Products: Framework of Analysis

**Great Plains Biomass Working Group
Ames, IA
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Project Overview

- Identifying effective state incentive mechanisms to foster biofuels, biopower, and bio-based products development
- Evaluating opportunities to adapt or package state incentives to complement federal and local incentives
- Three-year USDA-sponsored project
- Project team members:
 - North Carolina Solar Center – NC State University
 - Environmental and Energy Study Institute
 - New Uses Council



8/31/2006

Biomass Incentives Project

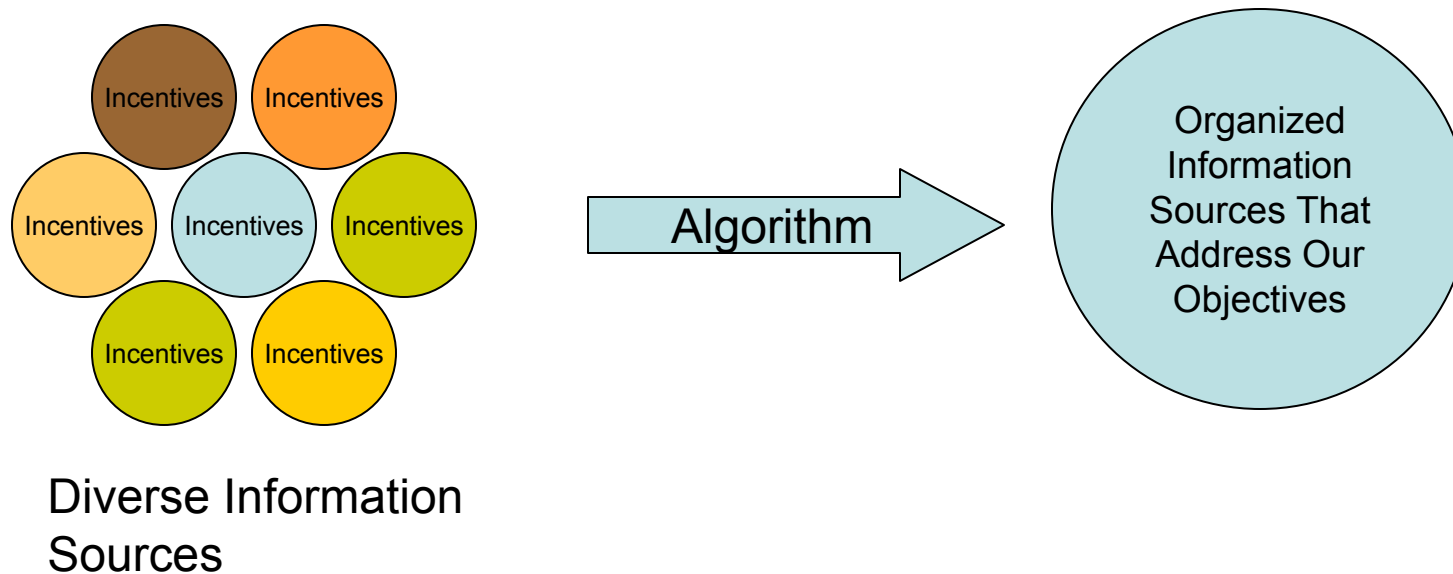
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Contributing Organizations

- American Coalition for Ethanol
- American Corn Growers Association
- American Farmland Trust
- American Soybean Association
- BioCycle
- Biogas Energy Systems
- Biomass Investment Group, Inc
- Cargill
- Center for Rural Affairs
- Climate Solutions
- Coalition of Northeastern Governors
- Council of Great Lakes Governors
- Dairyland Power
- DuPont
- Earthshell Corporation
- Federation of Southern Cooperatives
- GEMTEK Products
- Governors Ethanol Coalition: Nebraska
- Great Plains Institute
- Institute for Agriculture and Trade Policy
- IOGEN
- Michigan State University
- Mid-Atlantic Biofuels
- Minnesota Lung Association
- Minnesota Project
- National Association of Conservation Districts
- National Association of State Energy Officials
- National Biodiesel Board
- National Center for Appropriate Technology
- National Corn Growers Association
- National Farmers Union
- National Rural Electric Cooperative Association
- New England Wood Pellet, Inc
- New York State Energy Research and Development Authority (NYSERDA)
- North Dakota State Energy Office
- Oak Ridge National Lab
- Pennsylvania Department of Agriculture
- Piedmont Biofuels
- Renewable Fuels Association
- Renewable Lubricants
- State of Florida
- State of Kansas
- State of Minnesota
- State of New Mexico
- SUNY: State University of New York
- University of Idaho
- University of Tennessee
- US Department of Agriculture
- US Department Of Energy
- US Environmental Protection Agency
- Yale University

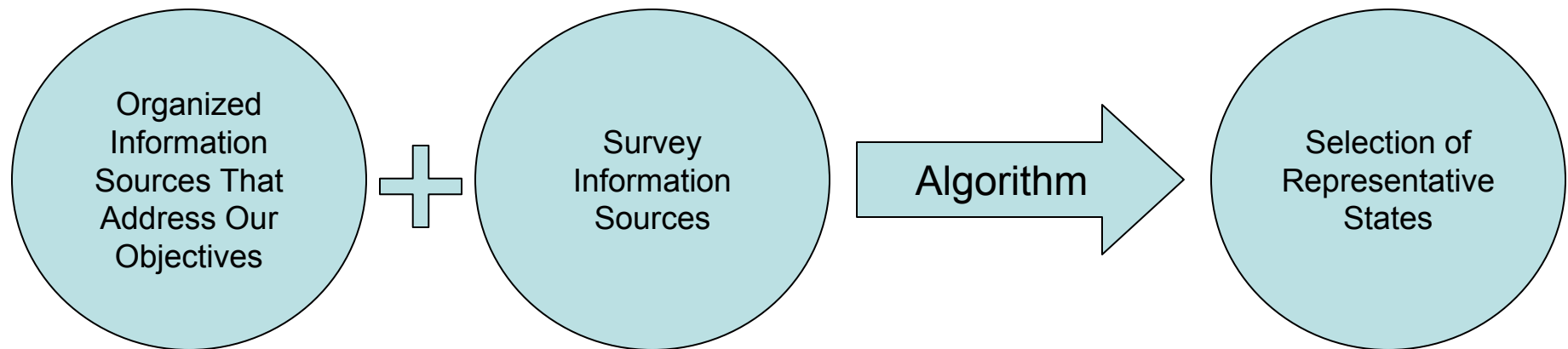
Literature Search

- Identification of Sources
- Development of Search and Organizational Algorithm



Identification of Biomass Incentives and Case Study Selection

- Collection of Incentives Data from DSIRE, Web Sources, Program Administrators, and Industry leaders.
- Development of organizational and ranking algorithm



Compilation of Biomass Incentives

- Loans
- Grants
- Leases
- Matching Funds
- Personal Tax Credits
- Tax Exemptions
 - Sales, excise, property, corporate & user
- Production Incentives
- Public Benefit Funds
- Trusts
- Development Funds
- Renewable Energy Portfolio Standards
- Set-asides
- Renewable Fuel Standards
- Interconnection Standards
- Net Metering
- Green Power Purchasing
- Rebates

Analysis of State and Federal Incentives

- Collection of Incentives Data
- Detailed examination of Incentives within the context of design, implementation, and operating environment.
- Development of analysis into supported recommendations in a narrative rather than statistical fashion.

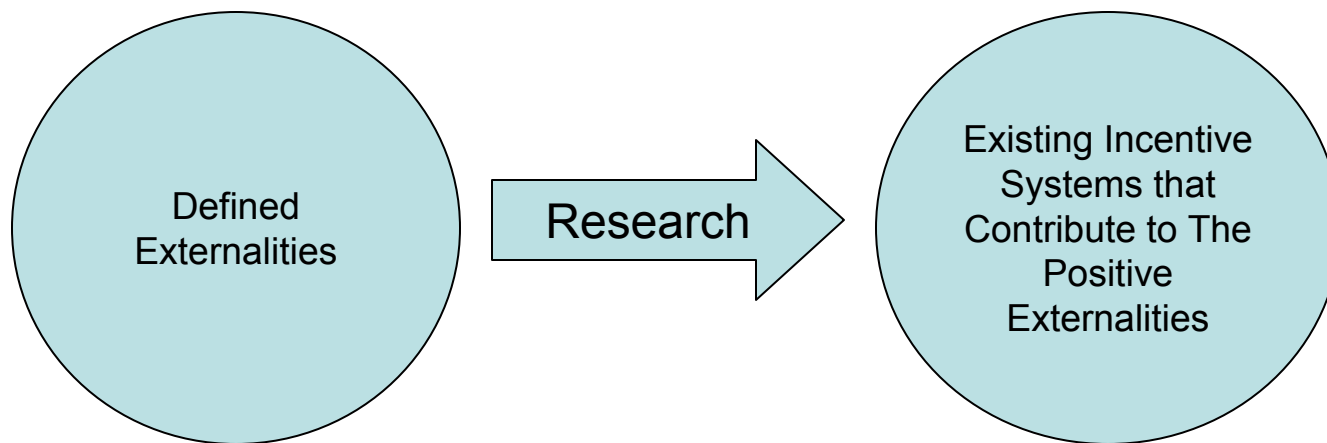
Identification of Biobased Technologies Externalities

Identification and Data Collection of Externalities associated with Biomass Technologies

- Creation of jobs
- Wildlife habitat enhancements
- Wildfire risk reduction
- Public health benefits
- Promotion of “Green Buildings”
- Improved national security
- Increased energy independence
- Promotion of advancements in science and technology
- Prevention of urban sprawl and property development over sensitive lands
- Improvements in animal waste handling technologies.
- Water quality improvement
- Reduction of trade deficit
- Improvement of air quality
- Reduction of carbon dioxide emissions
- Reduction of methane emissions
- Retention of small family farms
- Protection of biodiversity
- Reduction of fuel costs and price volatility
- Waste reduction
- Soil improvements

Incentives for Externalities Associated with Biobased Technologies

Develop a Repertoire of Complementary Incentives that Contribute to the Positive Externalities



Complementary Incentives (examples)

Economic

- Enterprise Zones
- Entrepreneurship Centers
- Small Business
- Kansas Bioscience Authority Act

Health

- National Pollution Elimination Discharge System

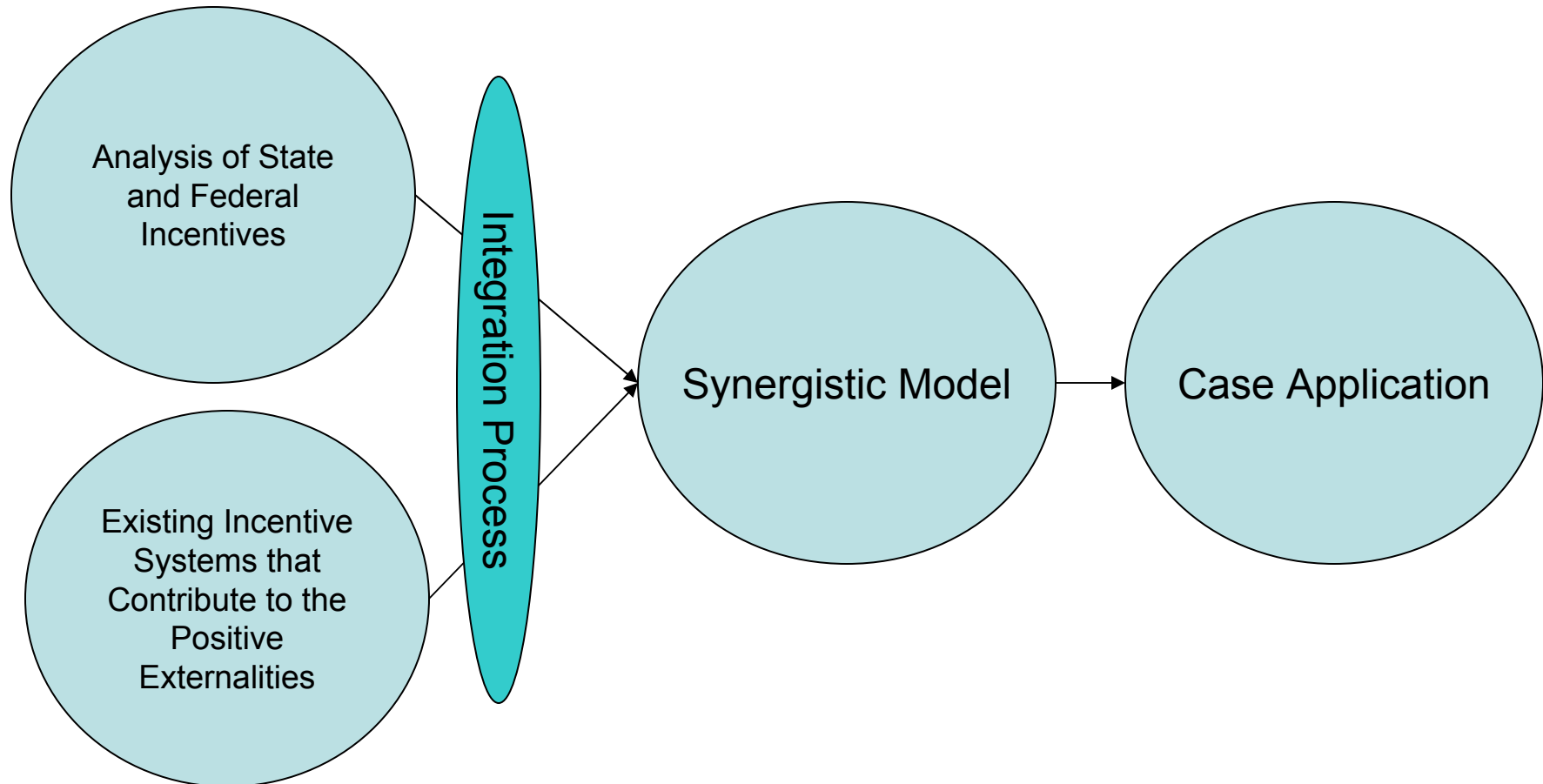
Air Quality

- Congestion Mitigation and Air Quality (CMAQ) Improvement Program

Natural Resources

- Environmental Quality Incentives Program

Evaluate Current Policy Framework to Develop Synergistic Incentive Systems



Audience

- State policy makers and entities interested in developing a biomass project and/or full-blown statewide biomass program
- The tool is also useful when states are conducting a state biomass assessment

Framework Development Process

Major Framework Components

Goals and Priorities

Potentials

Barriers

Externalities

Stakeholder/Local/Situation Factors

Technologies

Economics

Markets

Public Policy Conditions

1. Within each major component are specific **questions** designed to discuss and reveal the most **relevant issues**.
2. The model relieves the possible **answers** to those questions, along with an *evaluation or discussion of the logic behind such answers*.
3. Each question/answer pair is linked to a particular class of **prescriptive policy or incentive actions**.
4. Each question is graded on its **significance** by the project team, and by the user.
5. From this process an overview is generated on possible actions and decisions.

User Perspective of Framework

Major Framework Components

Goals and Priorities

Potentials

Barriers

Externalities

Stakeholder/Local/Situation Factors

Technologies

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Markets

Public Policy Conditions

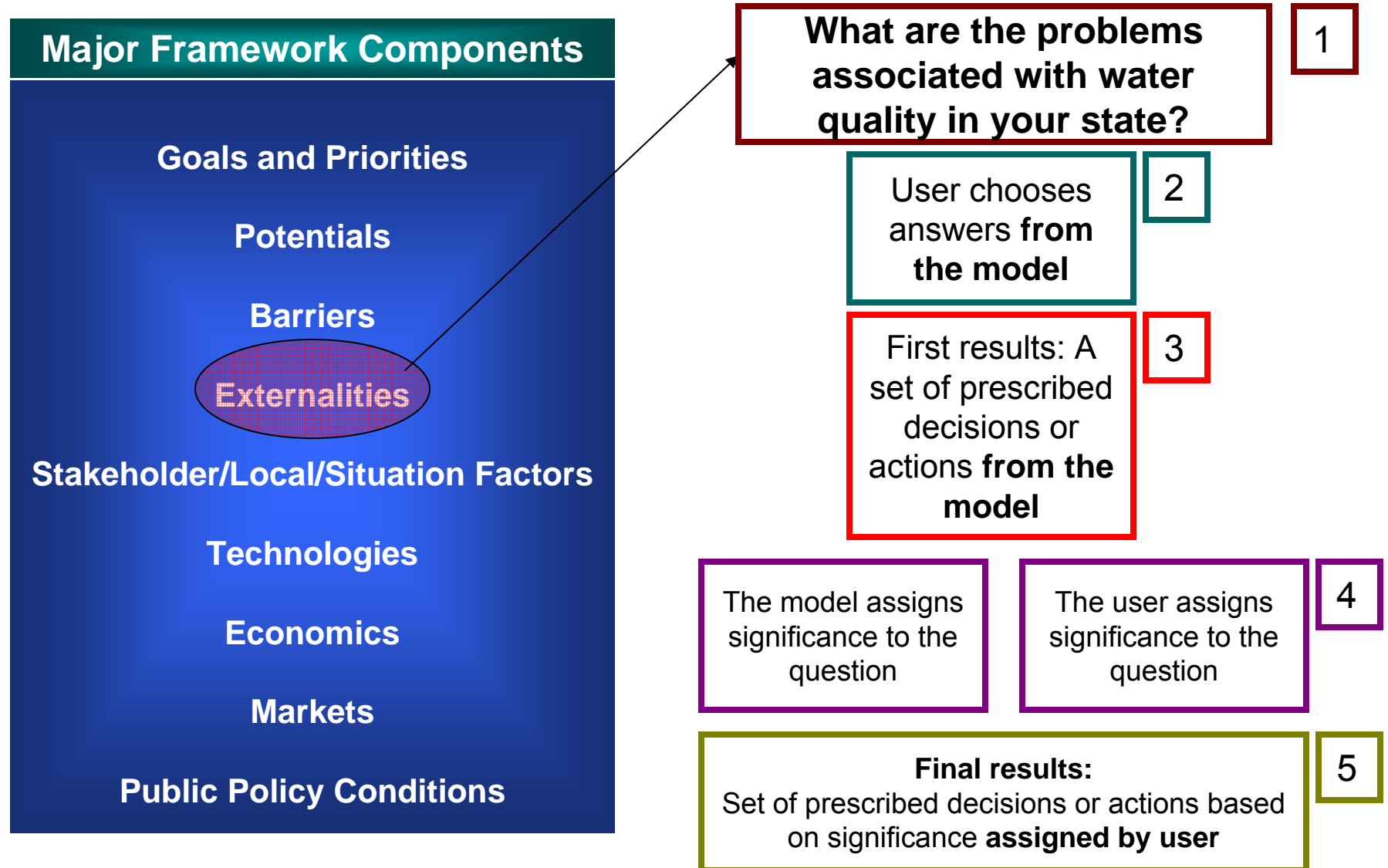
Each question leads ultimately to an incentive or public policy action.

A question can lead to another question as long as a public policy action can be prescribed at some point.

Interface Options

- The model can be worked in paper-text format
- The model can be built using Excel
- Ideally, software should be developed

User Perspective of Framework– Example I



User Perspective of Framework– Continued Example I



What are the problems associated with water quality in your state?

1

User Chooses Answers from the Model

2

Example Decision Element of “Water Quality”–

Agriculture runoff is increasing the quantity of fertilizers and other chemicals in our water.

Manure from Confined Animal Feeding Operations is seeping into the water table and flooding out of its lagoons during storms.

User Perspective of Framework– Continued Example I

Major Framework Components

Goals and Priorities

Potentials

Barriers

Externalities

Stakeholder/Local/Situation Factors

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Markets

Public Policy Conditions

1
What are the problems associated with water quality in your state?

2
User Chooses Answers from the Model– Logical Presentation and Discussion

Decision Element– Source of water contamination

Water quality can often be handled by creating stricter discharge regulations. If the cost of contaminating water is higher, than the installation cost of an anaerobic digester may be a more viable action. Additionally, since one of biggest barriers for anaerobic digestion is cost, direct loans or grants for capital investment are recommended for manure problems.

Agriculture runoff problems could be solved by planting crops which need fewer inputs or by planting crops that will help filter the water. Most crops which will do this will be good feedstocks for cellulosic ethanol technologies; hence incentives to establish a cellulosic facility in the area of bad water quality would be the best recommendation. Cellulosic ethanol technologies often need research grants and loan guarantees for commercialization.

User Perspective of Framework– Continued Example I



What are the problems associated with water quality in your state?

1

First results: A set of prescribed decisions or actions **from the model**

Manure from Confined Animal Feeding Operation is seeping into the water table and flooding out of its lagoons during storms.

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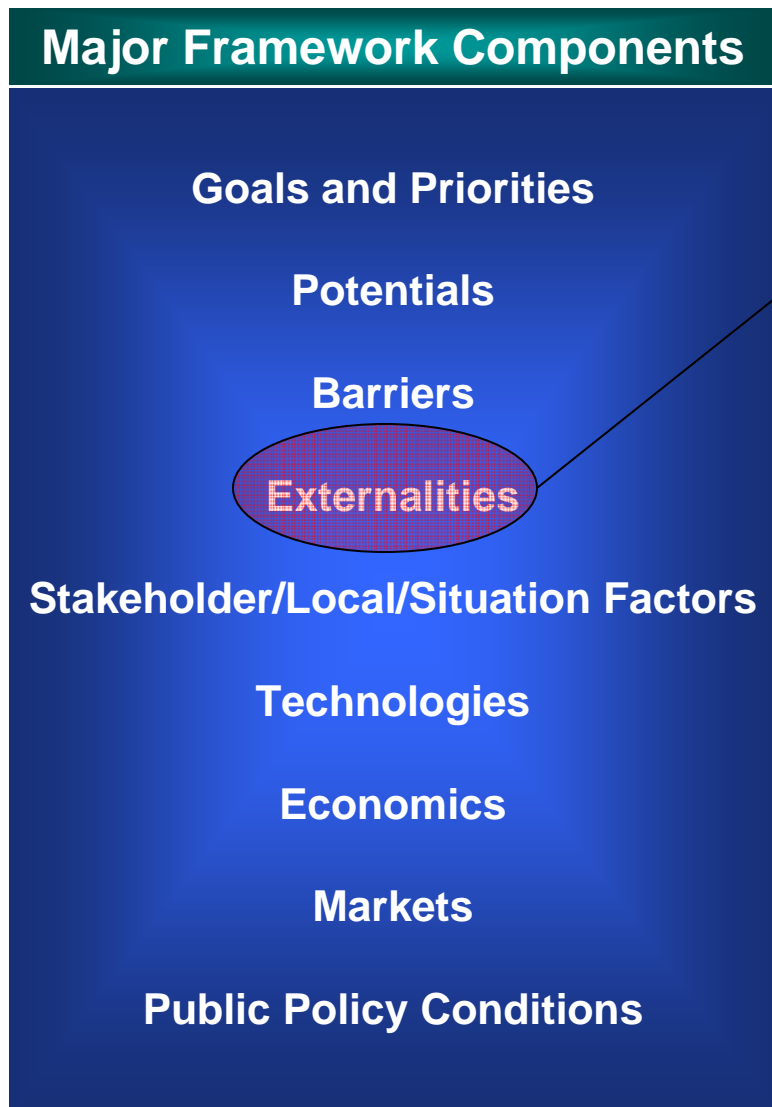
Prescribed Actions:

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Direct loans or grants for capital investment for biomass and create stronger water quality regulations.

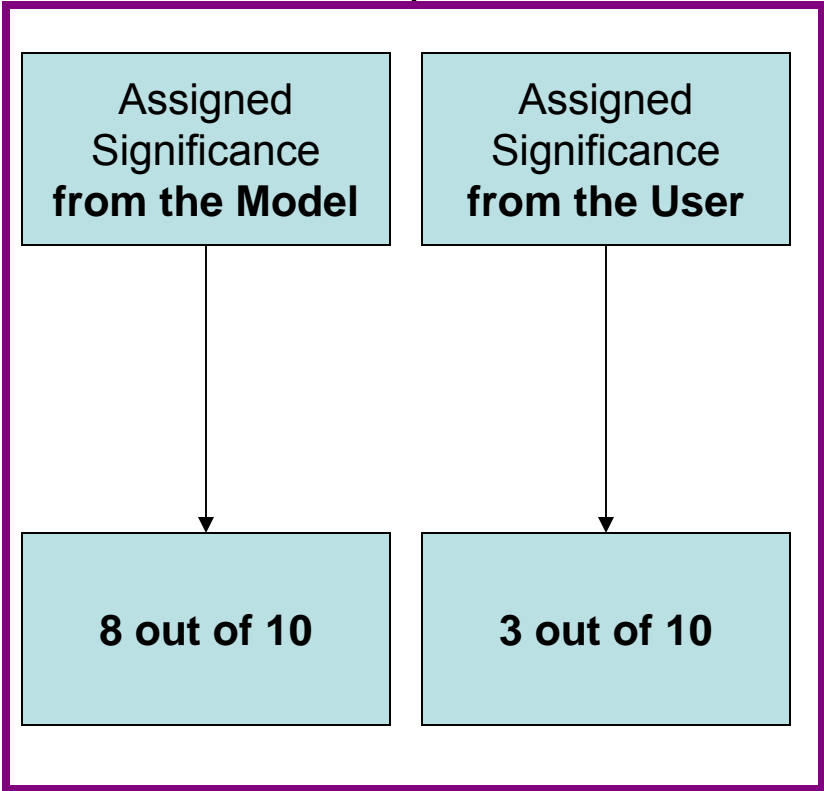
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User Perspective of Framework– Continued Example I



What are the problems associated with water quality in your state?

1



4

User Perspective of Framework– Continued Example I



What are the problems associated with water quality in your state?

1

Final results:
Set of prescribed decisions or actions based on significance assigned by user

Direct loans or grants for capital investment for biomass and create stronger water quality regulations.

↓

User assigned low relevance to this issue because the state does not yet have the technical expertise to bring an anaerobic digester to fruition.

5

Summary of Framework

Major Framework Components

Goals and Priorities

Potentials

Barriers

Externalities

Stakeholder/Local/Situation Factors

Technologies

Economics

Markets

Public Policy Conditions

The framework and resulting overview should provide the following for the user:

- Awareness of new issues and/or important elements of the decision
- Determine whether the state or region has a scattered realm of issues or a focused one (clusters).
- Determine whether the state or region has a scattered realm of prescribed policy actions or a focused one (clusters).
- Prioritize among the different decision components and prescriptive actions
- Recognize differences in outlook or perspective for any one question or issue



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