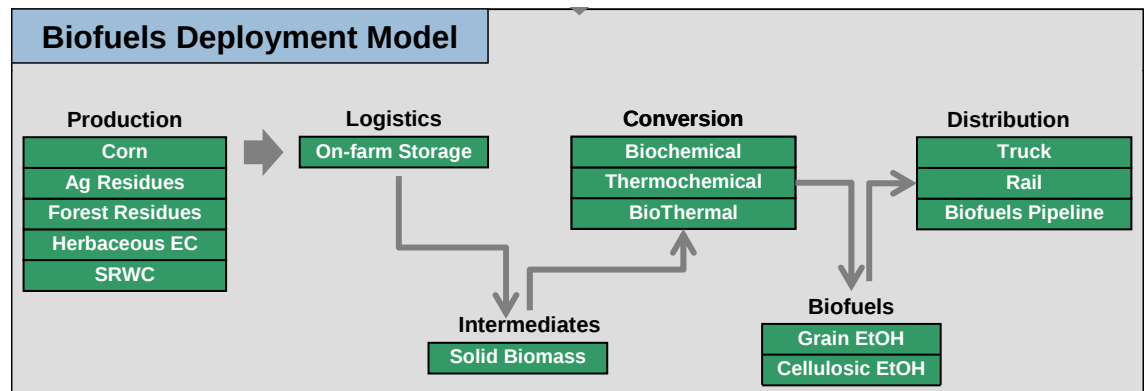




TA1 Project 2.1: Fuel Mix Strategies & Constraints – Large-scale Biofuels in US & China

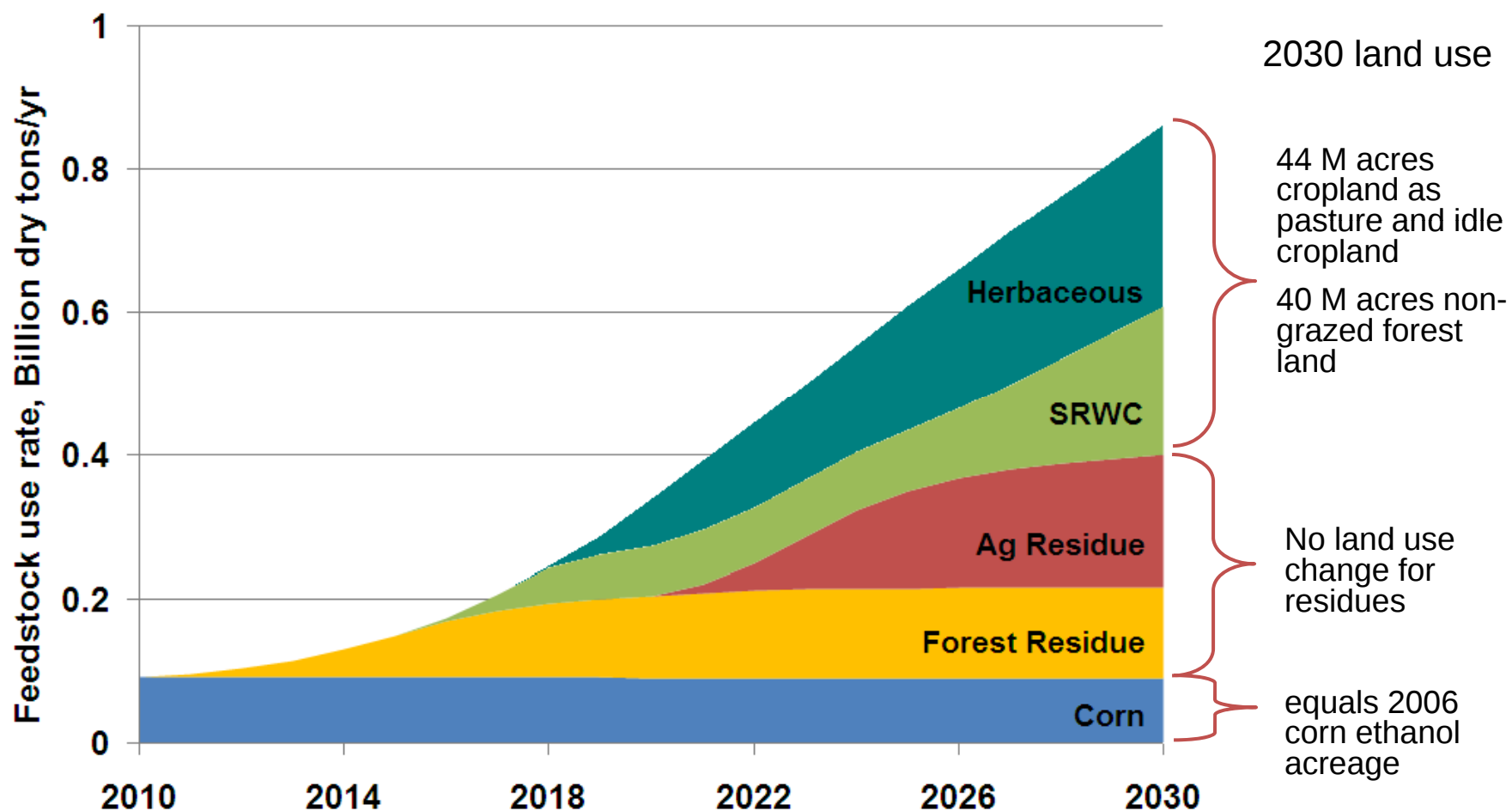
- System dynamic modeling of biofuel production in US & China
 - Examine biodiesel – petroleum fuel replacement
 - Consider regional constraints/conditions
 - Feedstocks
 - Water
 - Distribution infrastructure





Large-scale Ethanol Production in the US Requires Diverse Feedstock Resources

Results for 90 Billion Gallons of Ethanol Production





Water Requirements Vary Regionally

Comparison of Cellulosic Ethanol Production with Relative Water Use

LEGEND

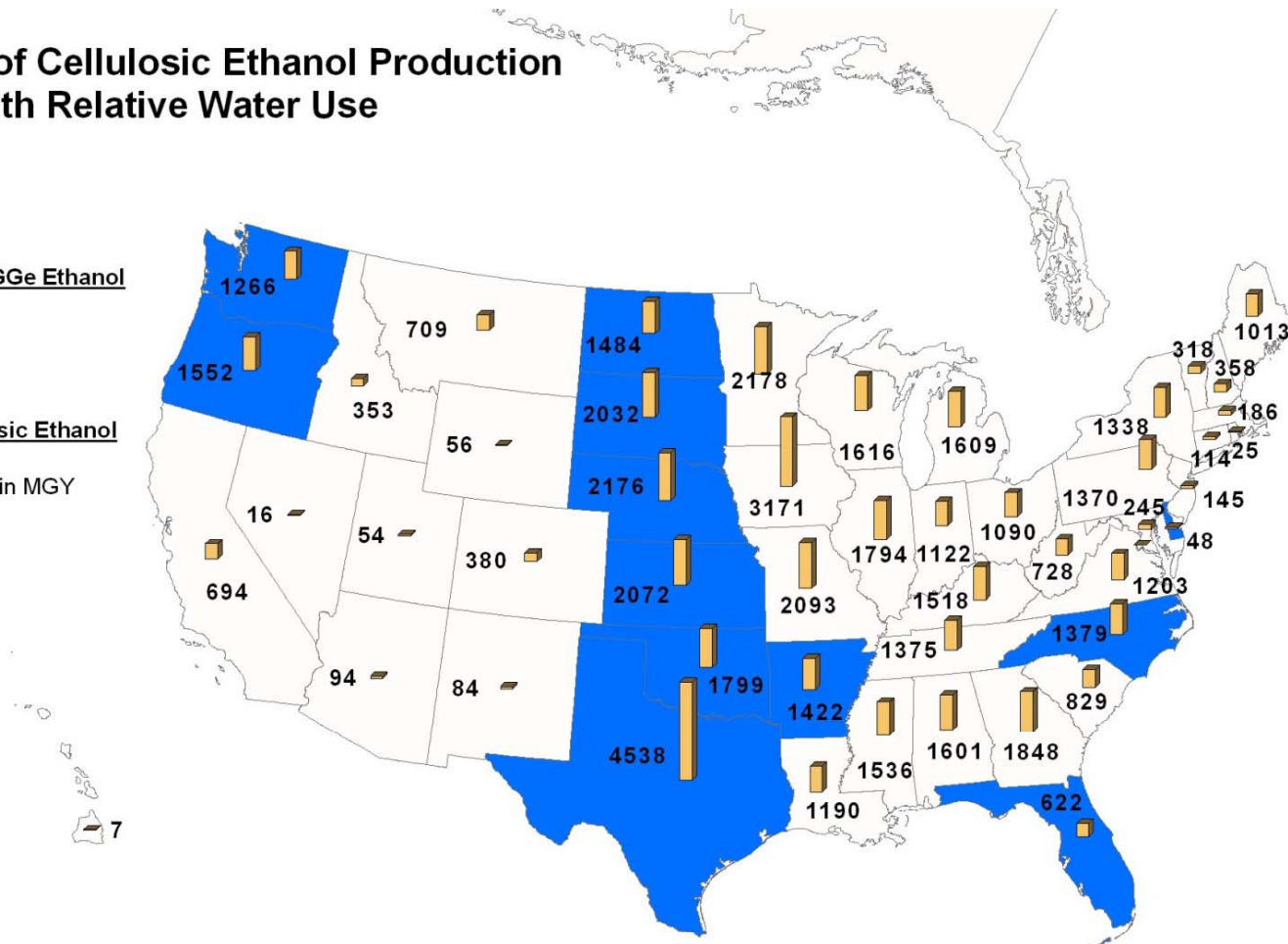
Gal Water / GGe Ethanol

< 7.5

> 7.5

GGe Cellulosic Ethanol

Label in MGY

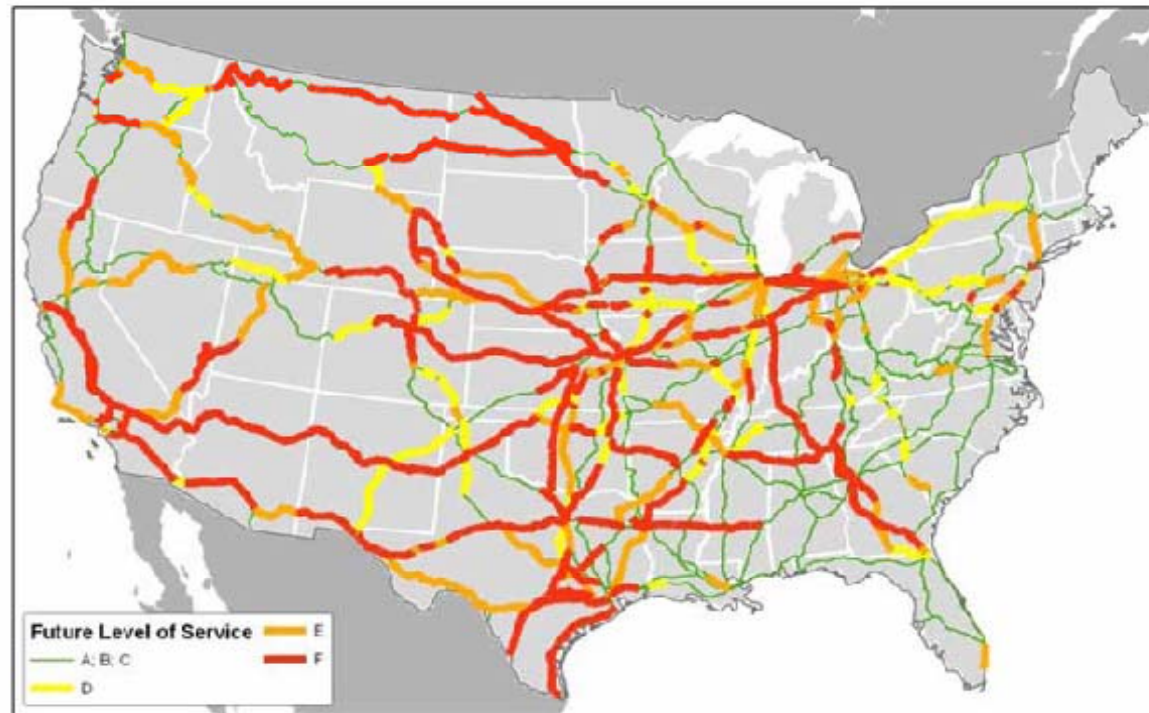




U.S.-CHINA CLEAN
ENERGY RESEARCH CENTER
中美清洁能源研究中心

Investment will be Necessary to Overcome Projected Rail Line Capacity Constraints – with or without Biofuels

Future Corridor Volumes Compared to Current Corridor Capacity *2035 Without Improvements*



Constraint **Marginal** **No Constraint**

2030 ethanol tank car tonnage is only a few percent of
projected total rail freight

* National Rail Freight Infrastructure Capacity and Investment Study by Cambridge Systematics, Inc.