

Challenges in Implementing Biofuels Mandates

A Refiner's Perspective

Rita Hardy

Flint Hills Resources, LP

Minnesota Environmental Initiative
The Future of Biofuels in Minnesota

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Who is Flint Hills Resources?

- Fuel and Chemical Manufacturer
- Refineries
 - **Pine Bend, MN**
 - 850 full-time employees, plus an average of 400 outside contractors every day
 - More than \$3 billion in capital projects/expansions since 2002
 - Crude capacity of 320 bpd
 - 2.1 billion gallons of gasoline in 2008
 - 1.3 billion gallons of diesel fuel in 2008
 - **Corpus Christi, TX**
 - **Fairbanks, AK**
- Fuel Distribution Network
 - Pipelines in WI and TX
 - Terminals in MN, WI, TX, AK
- No crude production/ No retail

Federal Biofuels Mandate (EISA)

Renewable Fuels Standard (RFS)

RFS2 Nested Standards

Year	Total Renewable Fuel			
	Total Advanced Biofuel			
	Biomass-Based Diesel	Cellulosic Biofuel		
2007			4.7	
2008			9.0	
2009	0.5		0.6	11.1
2010	0.65	0.1	0.95	12.95
2011	0.80	0.25	1.35	13.95
2012	1.0	0.5	2.0	15.2
2013	TBD*	1.0	2.75	16.55
2014	TBD	1.75	3.75	18.15
2015	TBD	3.0	5.5	20.5
2016	TBD	4.25	7.25	22.25
2017	TBD	5.5	9.0	24.0
2018	TBD	7.0	11.0	26.0
2019	TBD	8.5	13.0	28.0
2020	TBD	10.5	15.0	30.0
2021	TBD	13.5	18.0	33.0
2022	TBD	16.0	21.0	36.0

* The Administrator shall promulgate rules establishing the applicable volumes under this clause no later than 14 months before the first year for which such applicable volume will apply.

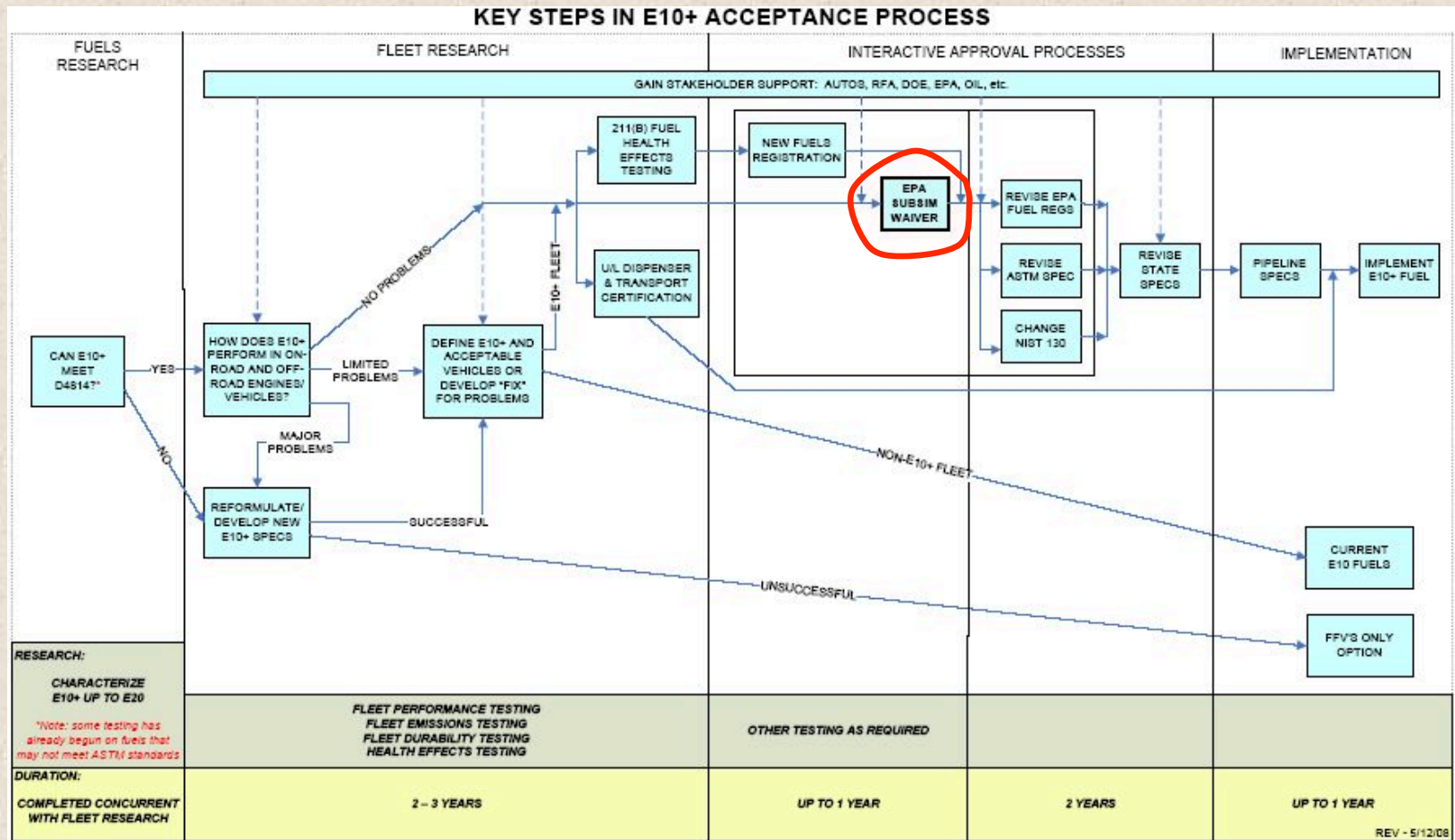
Federal **EISA/RFS** Implementation Concerns

- **Harmonization of Federal/State requirements**
- **Availability**
 - Infrastructure
 - Supply of 2nd generation biofuels
 - **Commercialization**
 - Technology Development
 - Production economics

MN Mandates: **E20 or E10+** Implementation Concerns

1. Who are the stakeholders?
2. What are their concerns?
 - Vehicle Manufacturers
 - Small Engine Manufacturers
 - Fuel Manufacturers (Petroleum & Biofuels)
 - Government (Federal & State)

Approval Process for E10+



COMPLEX.....LONG PROCESS (6 YRS ?)

MN Mandates: **Biodiesel**

Implementation Concerns

- **B2 Experiment**

- Shaky start
- Lots of learnings
 - Good quality B100 crucial!!

- **B5 Experiment** coming in winter of '09-10

- Cold Weather Performance
 - Solutions for Petroleum Diesel
 - Kerosene blending
 - Additives
 - Solutions for B5 Blends
 - Kerosene blending not as effective
 - Additives ?
 - Concern: Performance not proven at sustained temperatures below -15 F

- **Renewable Diesel**