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UNIVERSITY OF TECHNOLOGY SYDNEY
Institute for Sustainable Futures

Industry Forum
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Institutional Barriers to Intelligent Grid

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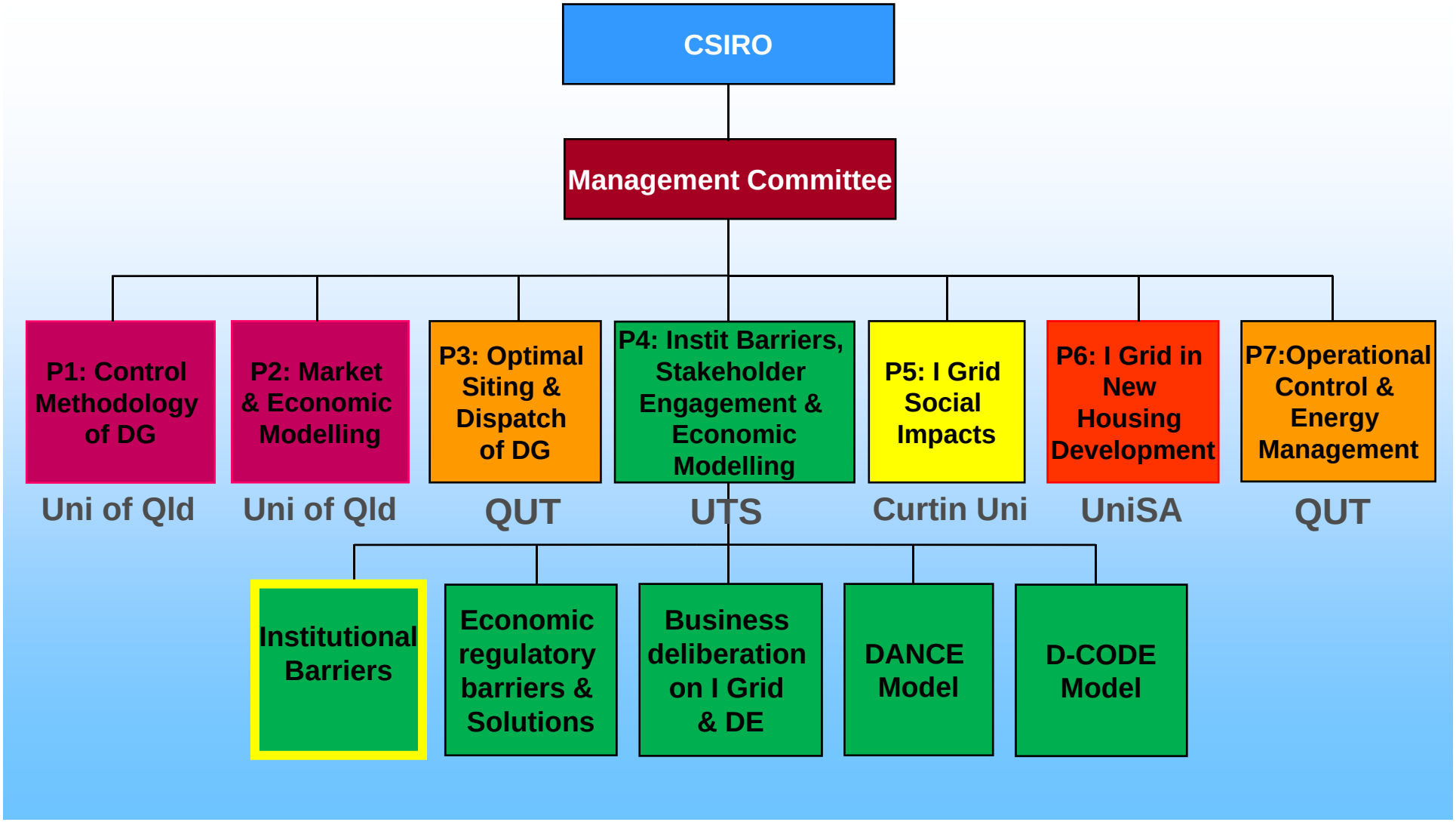
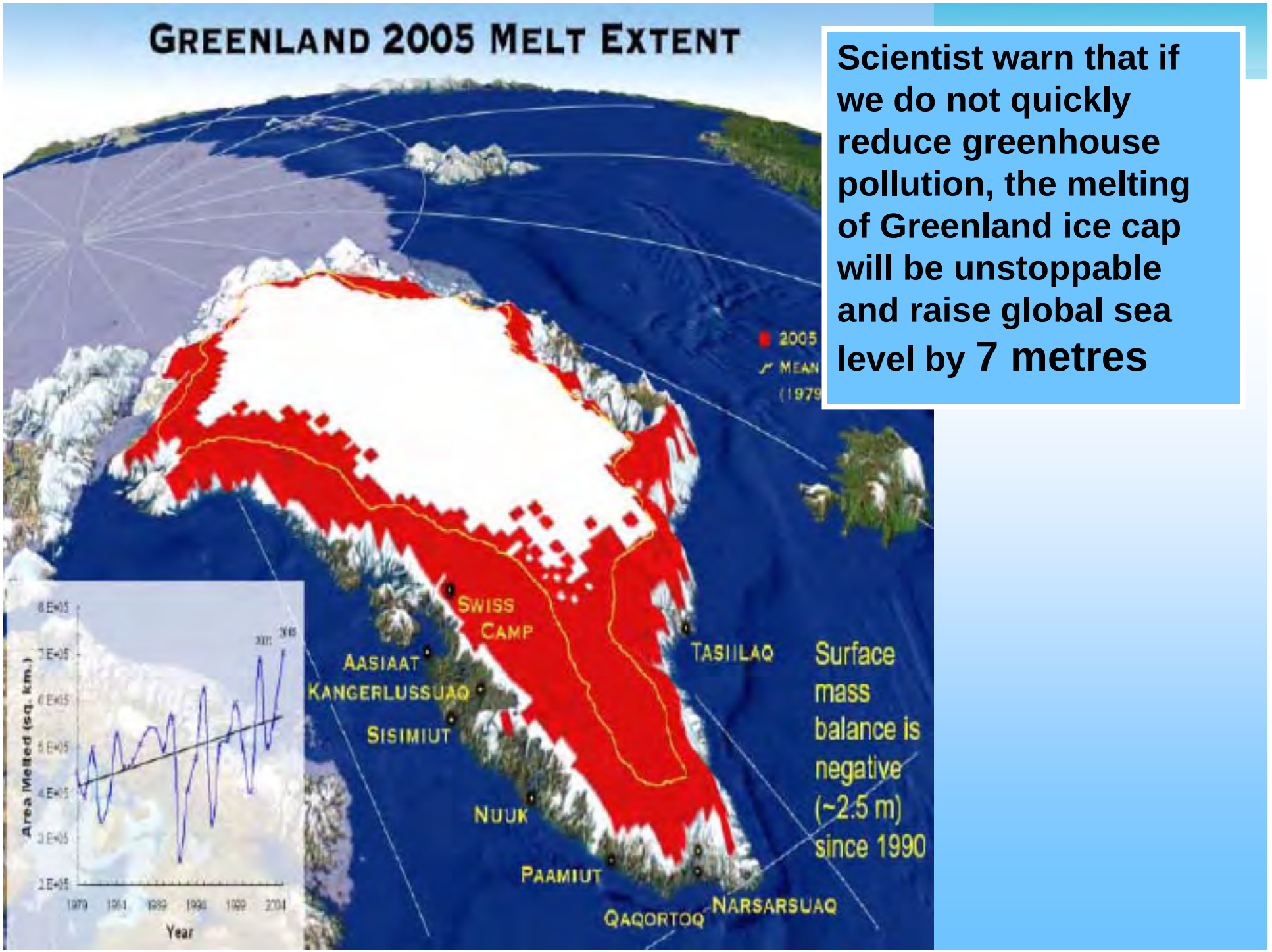
Institute for Sustainable Futures, UTS

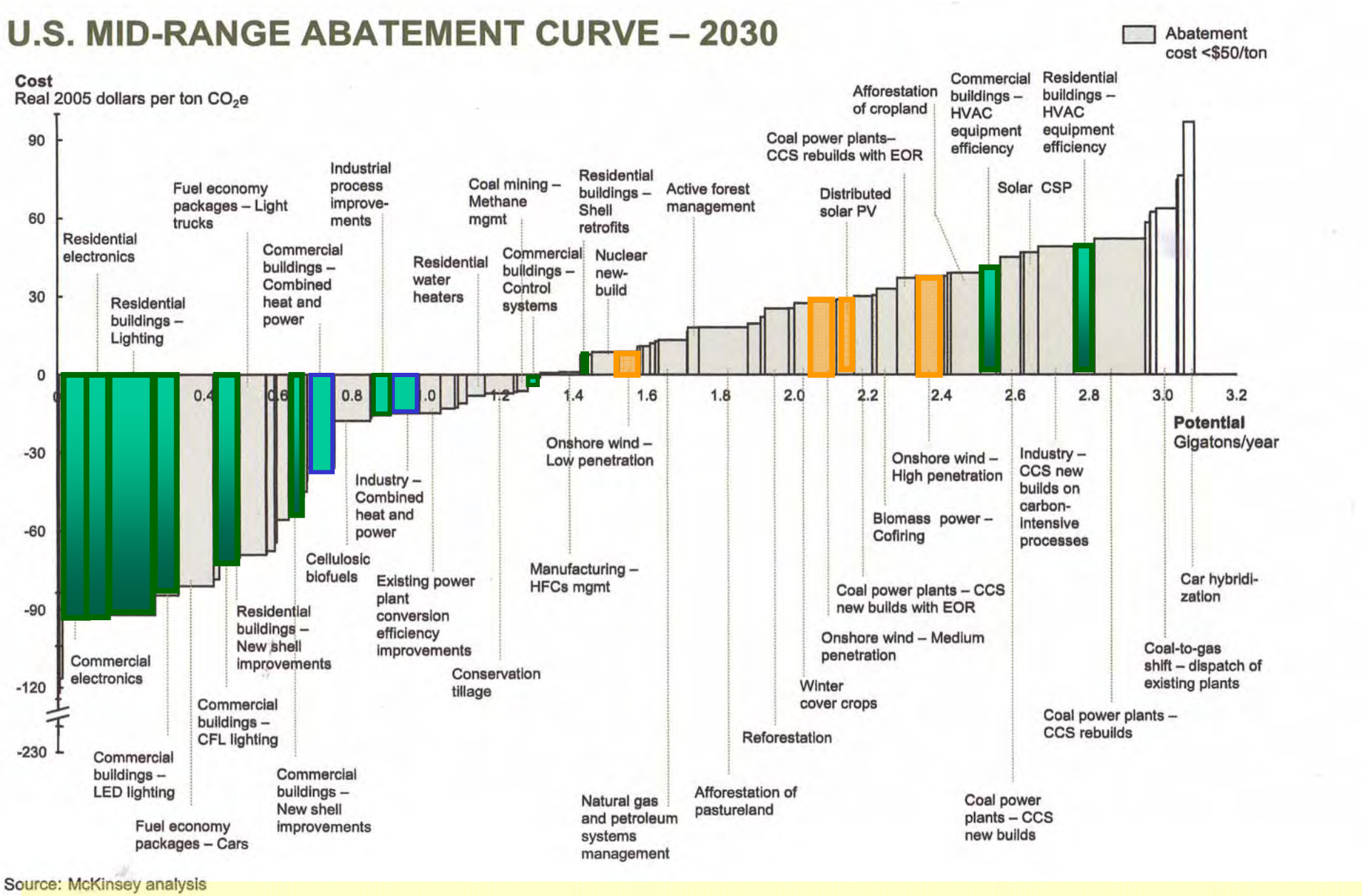
National Research FLAGSHIPS Energy Transformed | CSIRO | Australian Technology Network | Curtin University of Technology | QUT Queensland University of Technology | The University Of Queensland Australia | UniSA | Institute for Sustainable Futures | University of Technology Sydney

I-Grid Research Program Structure



Why study Institutional Barriers to DE?

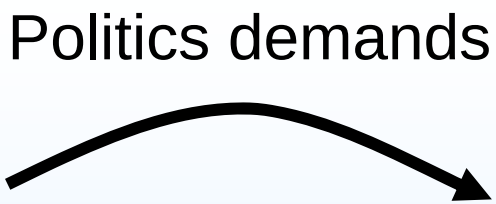

GREENLAND 2005 MELT EXTENT
Scientist warn that if we do not quickly reduce greenhouse pollution, the melting of Greenland ice cap will be unstoppable and raise global sea level by 7 metres
2005
MEAN
(1979
SWISS CAMP
AASIAAT
KANGERLUSSUAQ
SISIMIUT
NUUK
PAAMIUT
QAQORTOQ
NARSARSUAQ
TASIILAQ
Surface mass balance is negative (~2.5 m) since 1990
Area Melted (sq. km.)
Year



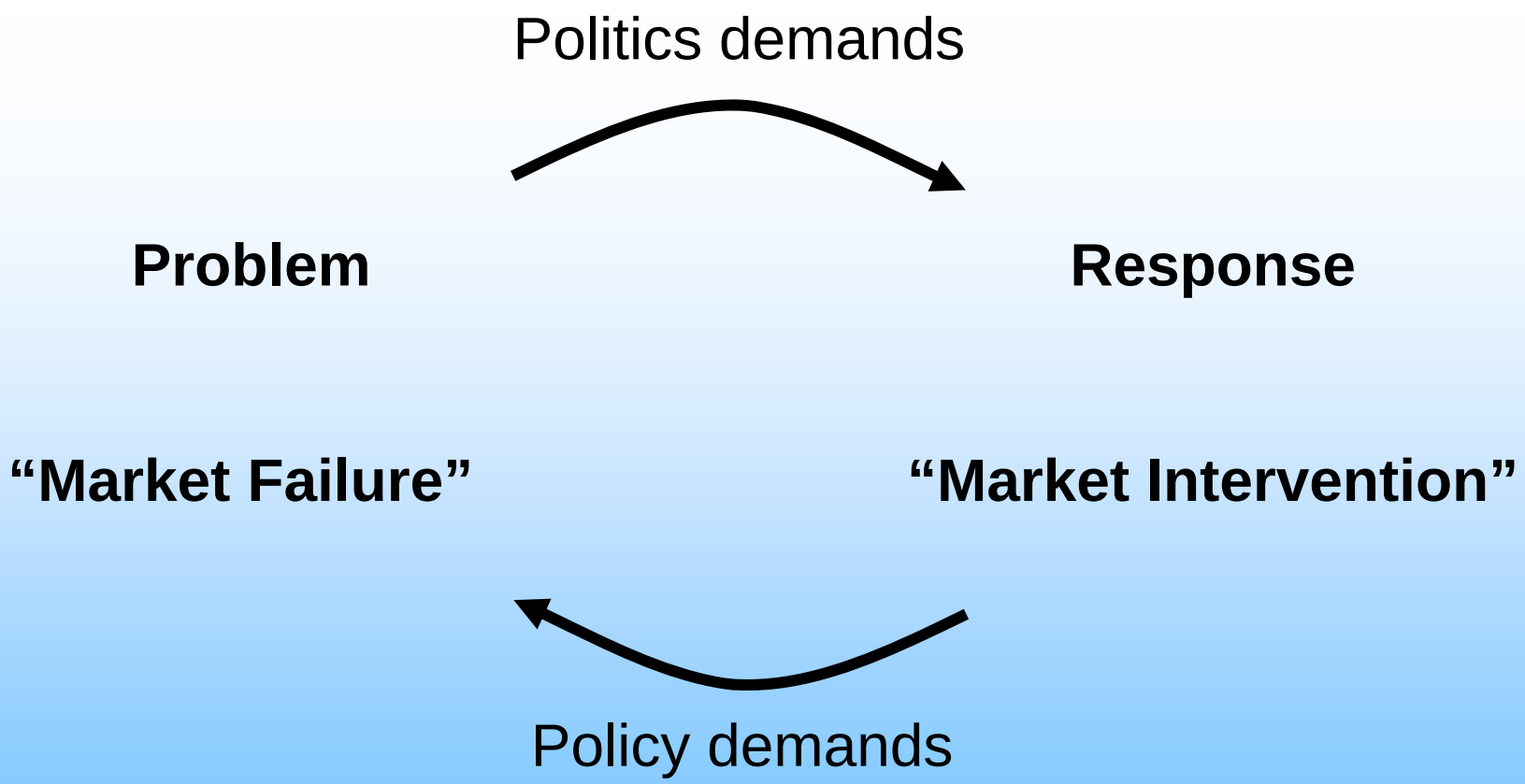
Source: McKinsey analysis

Distributed Energy is crucial to carbon abatement

"United States could reduce emissions by 31% to 46% by 2030"



Problem **Response**


Politics demands
Problem
Response
“Market Failure”
“Market Intervention”
Policy demands

A licence to act.

"Climate change is a result of the greatest market failure the world has seen." – Sir Nicholas Stern, Nov 2007

"the greatest market failure ever seen". – Prof Ross Garnaut, July 08

"once we have an effective price on carbon through an Emissions Trading scheme, we can do away with a range of inefficient policies and programs…"

MRET, PV Rebate, EEOA, VEET, REES, NEET, etc,

Barriers to Distributed Energy

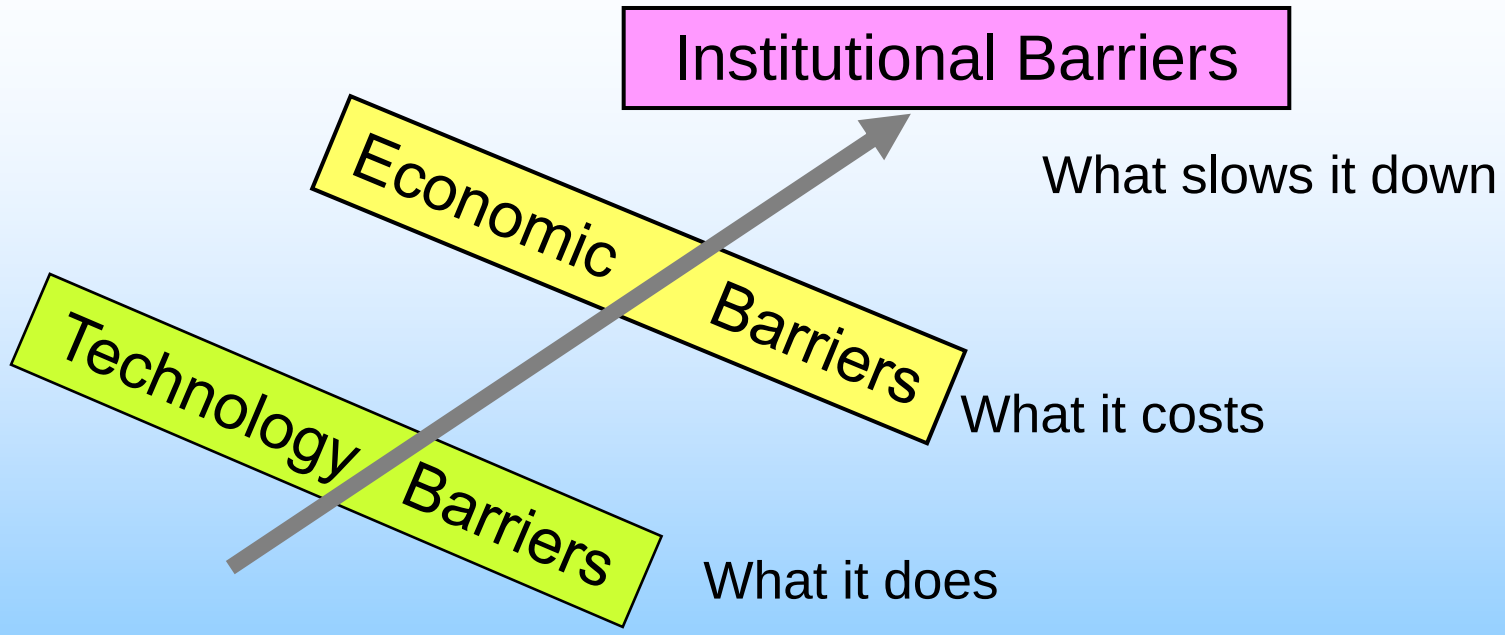
"Non-Institutional" Barriers include:

- Technical barriers
- Economic (cost) barriers

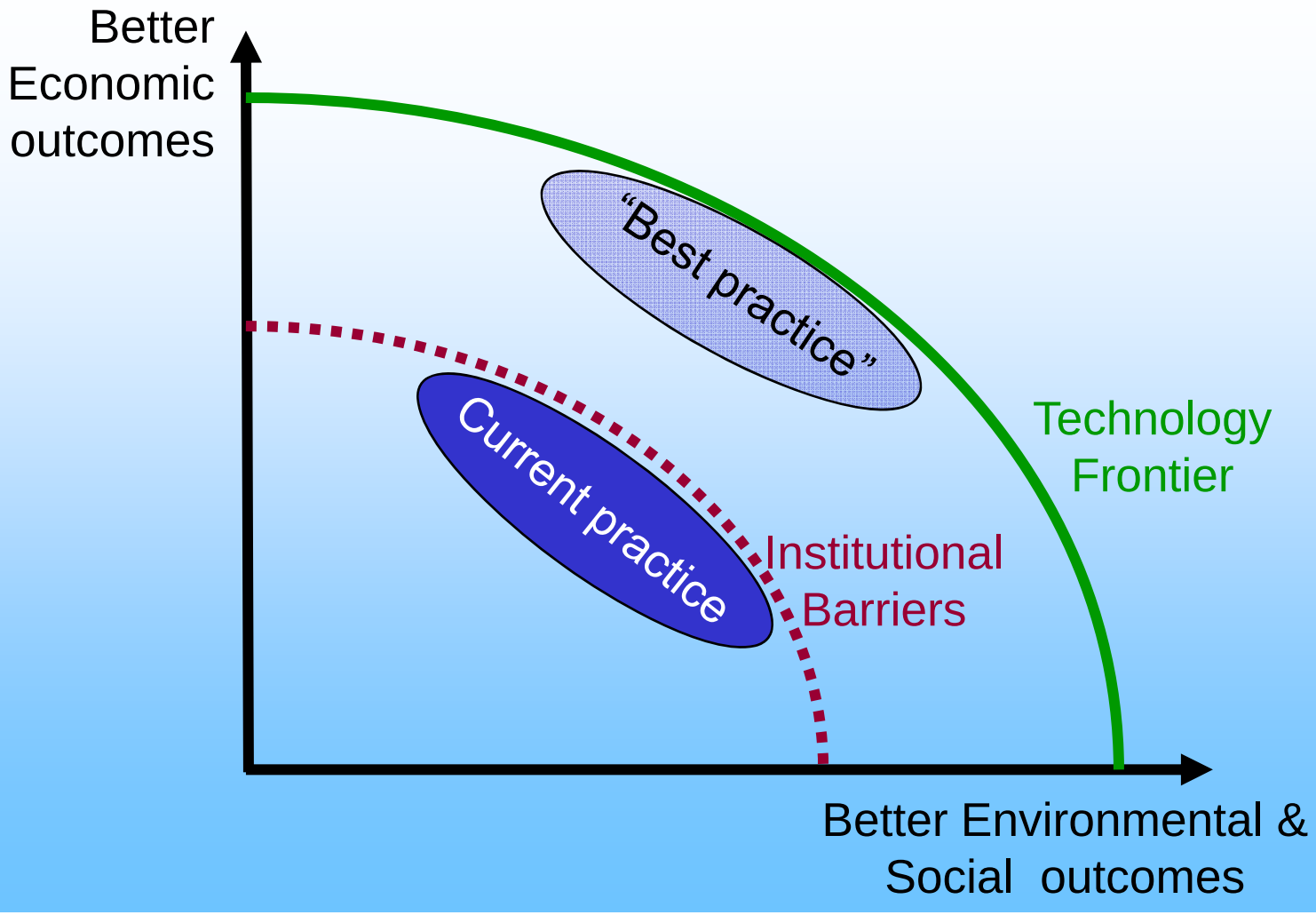
Some Institutional Barriers (and market failures)

1. Imperfect Information
2. "Regulatory failure" and inefficient incentives
3. External Costs excluded
4. Inefficient pricing (not cost reflective)
5. Split Incentives (landlord/tenant problem)
6. High transaction costs
7. Lack of access to finance
8. Cultural norms
9. Underdeveloped market for Distributed Energy

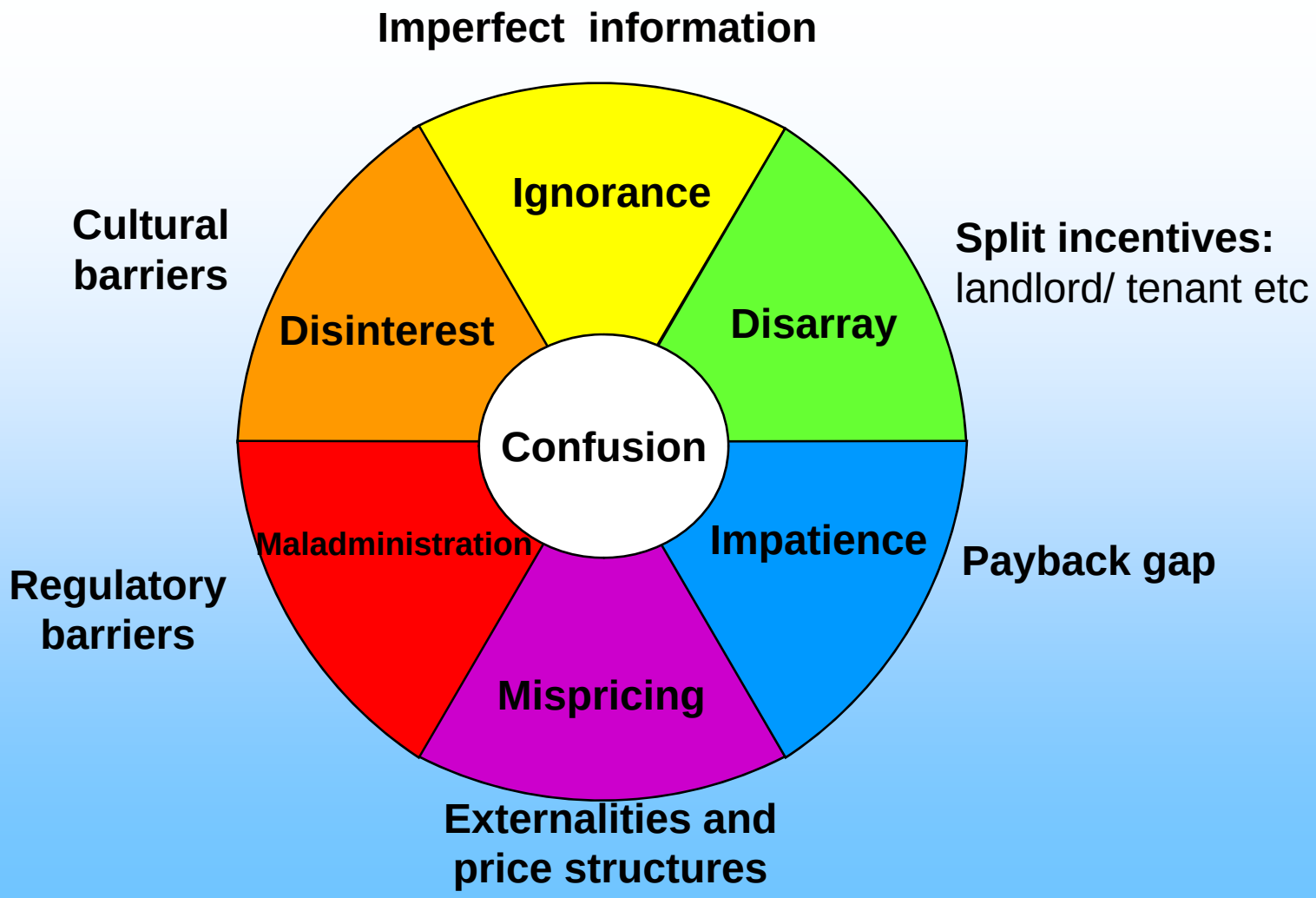
Barriers to Distributed Energy



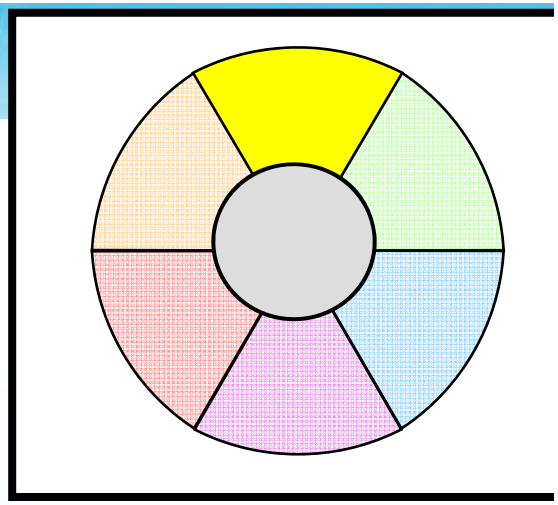
Institutional Barriers: A framework



Barriers to Distributed Energy: "The Seven D.E. Sins"



Imperfect Information "Ignorance"



Inadequate or costly information about:

- Energy operating costs (when purchasing): "First cost disease"
- Energy operating costs (when operating): "Who pays the bill?"
- Benchmarks for energy performance: "What's normal?"
- Lack of DE precedents: "Will it work?"
- DE technologies and opportunities: "What does it really cost?"
- Network planning information: "DM: when, where, how much?"

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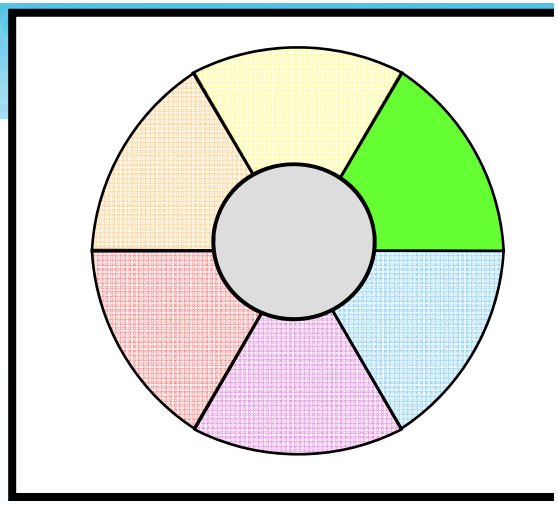
Split incentives: “Disarray”



- “Tenant /landlord” problem
- Complex decision making
- “Tragedy of the Commons”
- Search and negotiation costs
- Lack of Trust/ Confidence

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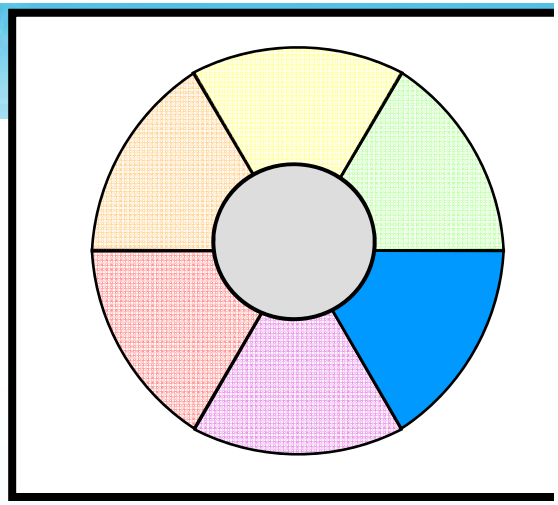
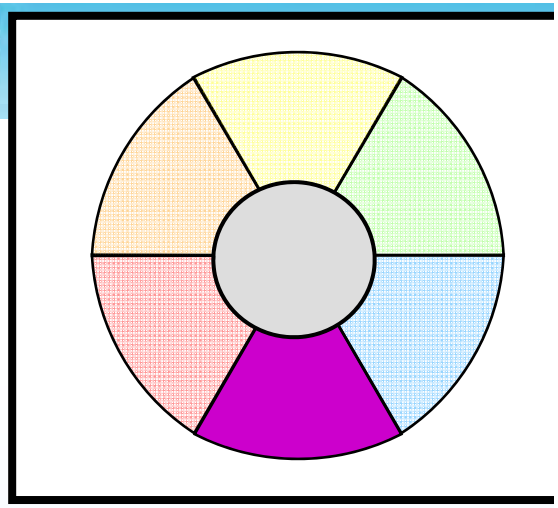
Payback Gap
"Impatience"



Why do we pay off network infrastructure over 40 years but expect distributed energy to be paid off within 5 years?

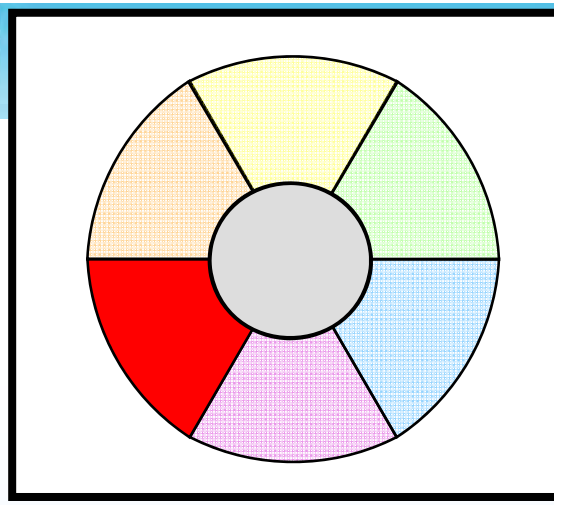
> Differential access to finance
> Social vs personal discount rates
> Regulated monopoly vs competitive providers
> Different risk profiles
> Differential cost of sales
> Economies of scale

Inefficient Pricing
"Mispricing"



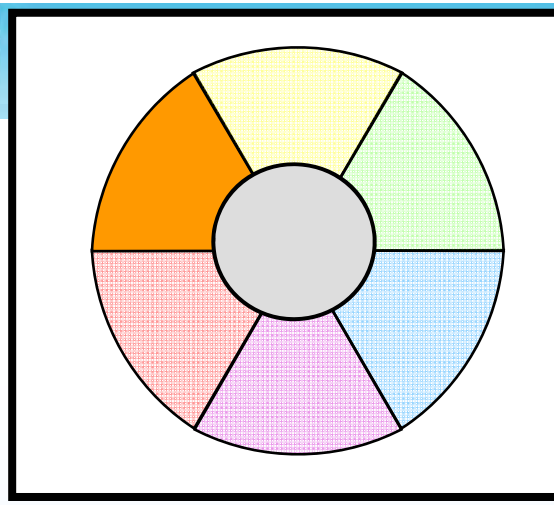
- Externalities (Environmental costs/ Carbon Price)
- Inefficient Price structures
  - Flat tariffs
  - Average instead of marginal cost pricing
  - High fixed and standby charges
  - Undervaluing DE options

Regulation
"Maladministration"



- Coupling (monopoly) profits to sales volumes
- Perverse environmental regulations
- Prohibitive conditions on network connection/access

Inappropriate Cultural Values
"Disinterest"



- Cultural lag
  - Conventions
  - Conservatism
  - Skills lag
- Prisoner's Dilemma
  - Cynicism

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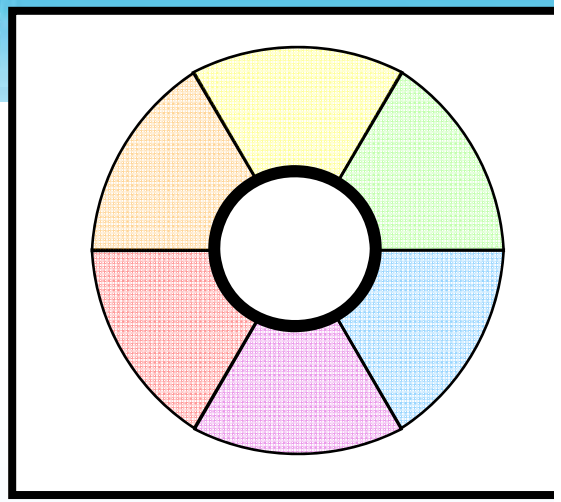
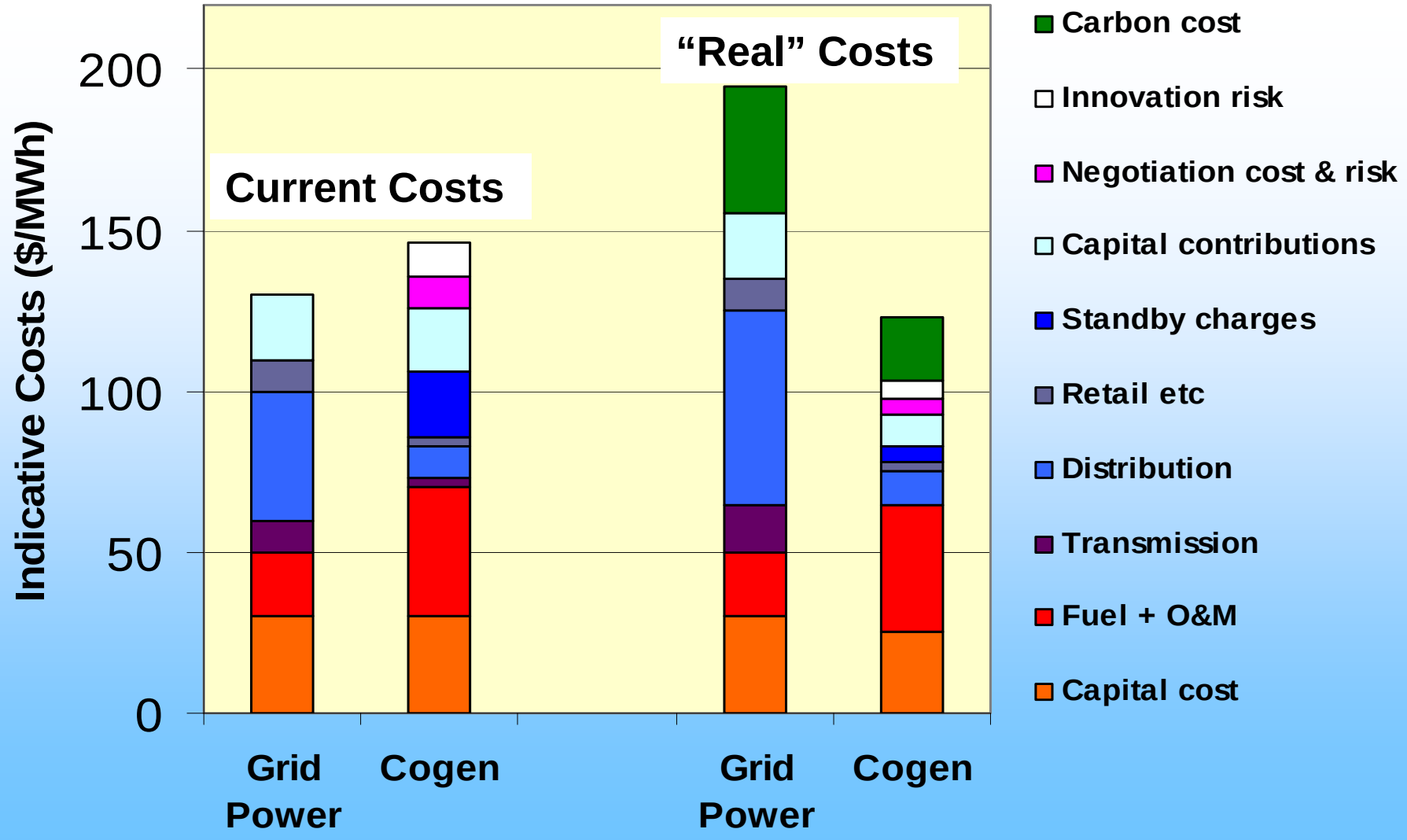
Interaction between barriers
"Confusion"

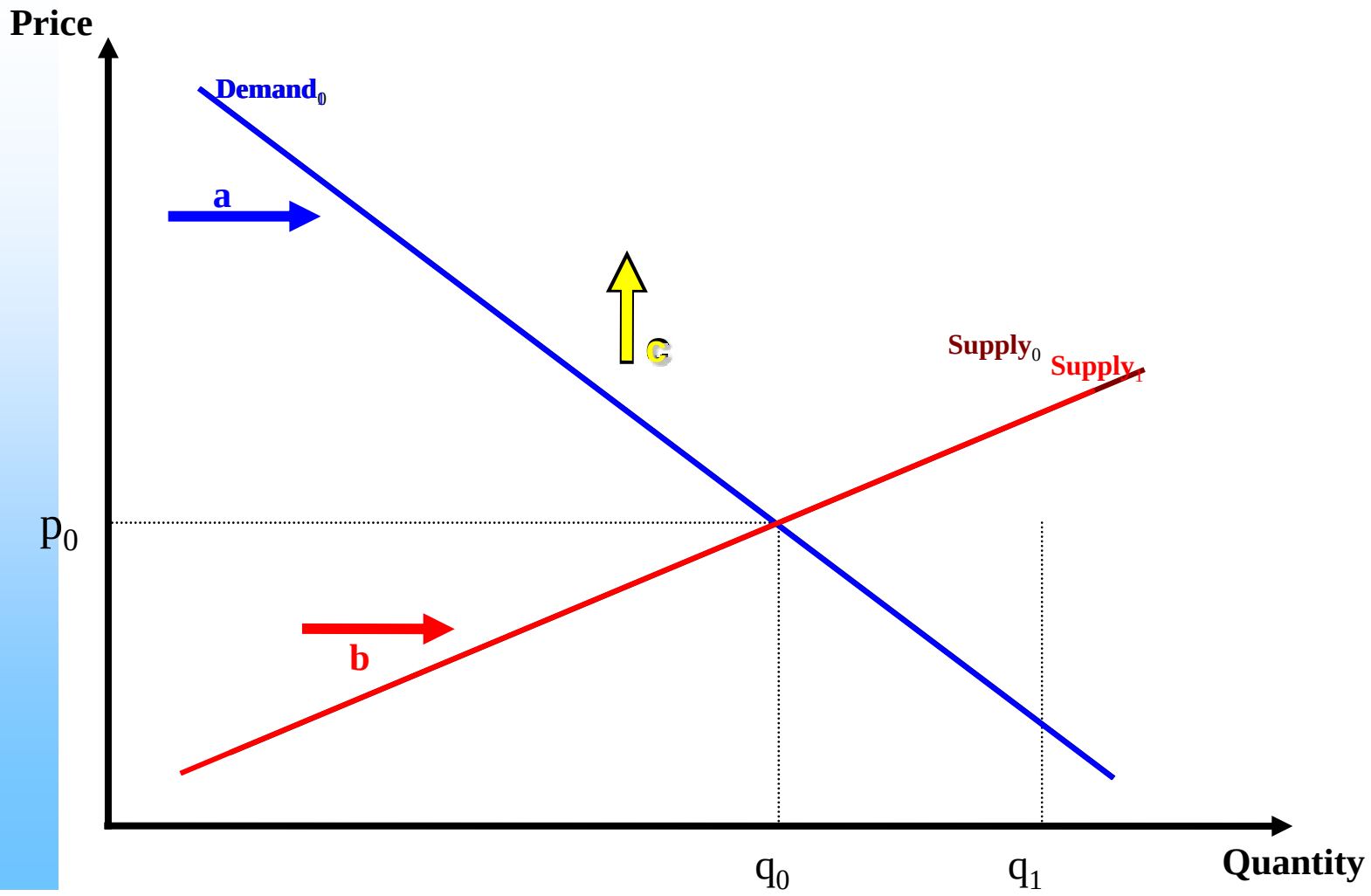


- Management complexity/ Policy paralysis
- Interagency and intergovernmental disorder

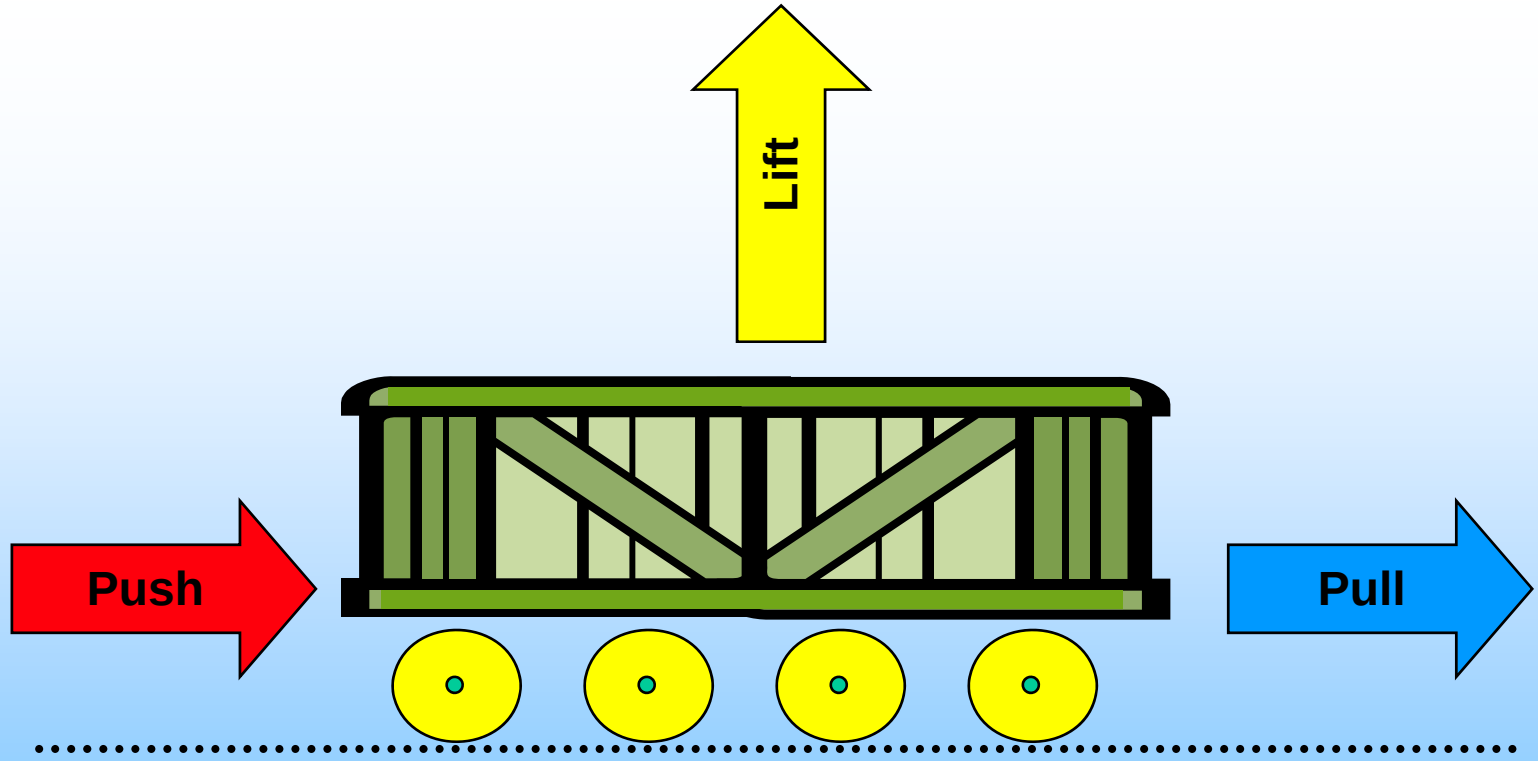
Indicative Impact of Institutional Barriers on Costs



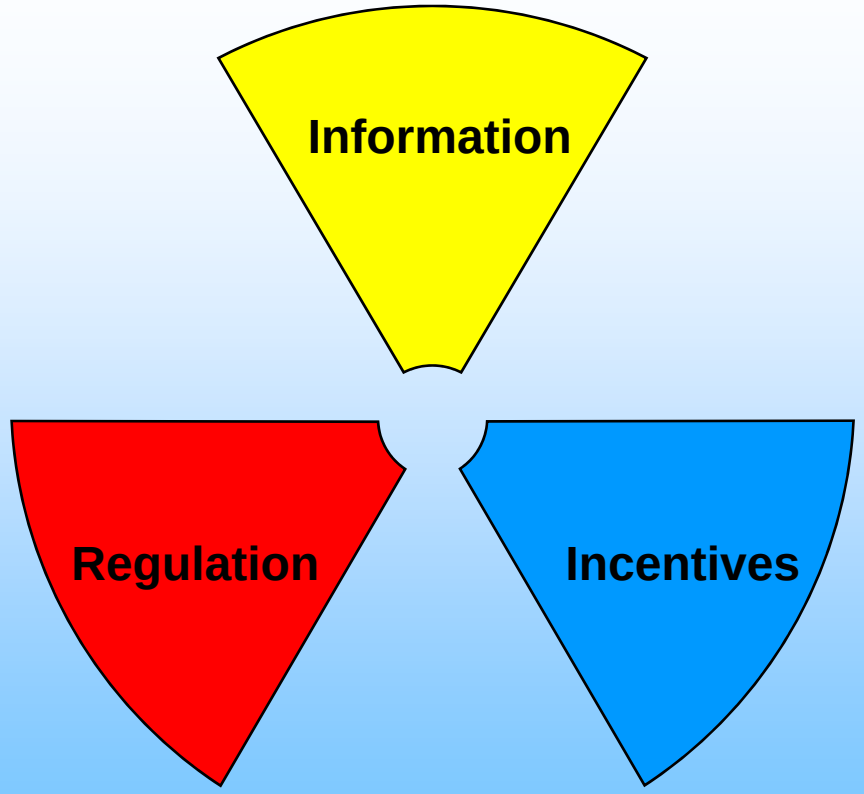
Overcoming Institutional Barriers: "Moving the Market"



Overcoming Institutional Barriers: "Moving the Market"



The Policy Palette



Primary Instruments

The Policy Palette

+ Secondary Instruments

The Policy Palette - "PIRFICT"

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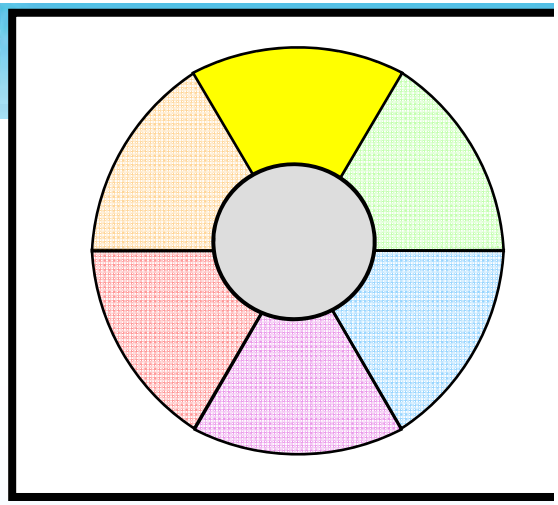
Information



- Benchmarking
- Performance labelling
- Performance Reporting (without target)
- Education and Awareness campaigns
- Energy management
- Case studies

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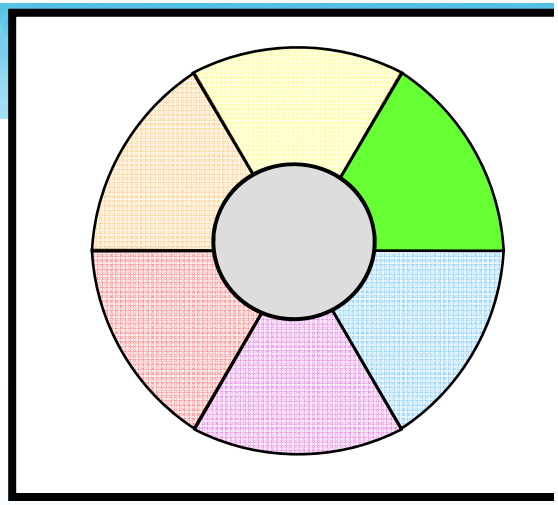
Facilitation



- High Level Commitment
- Accreditation
- Training
- Audits, Advice and Assistance
- Case Studies
- Networking
- Community Engagement

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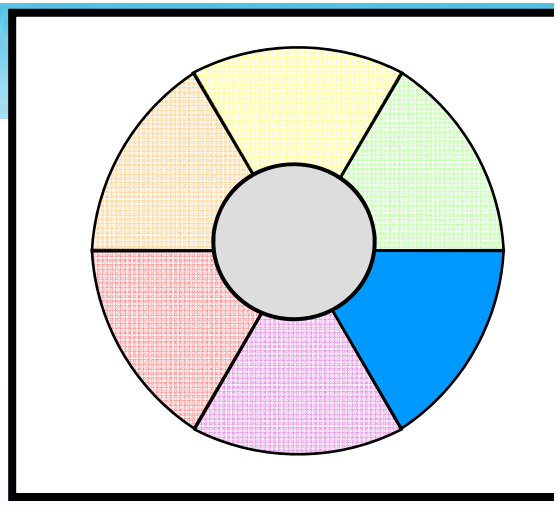
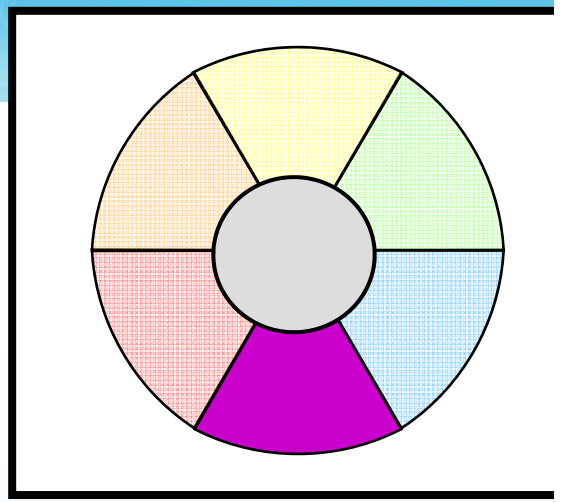
Incentives



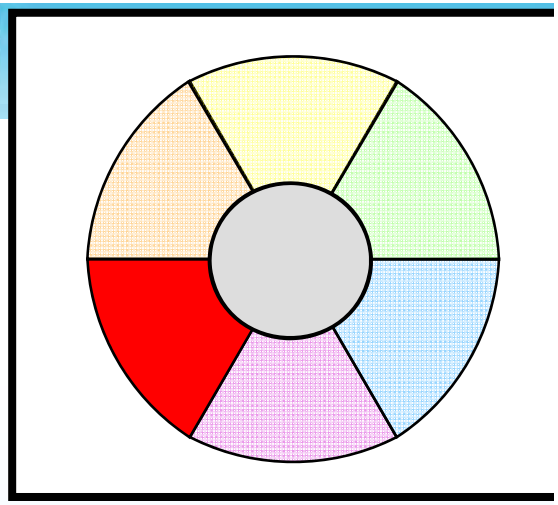
- Cash Rebates
- Competitive Subsidies
- $ support for Research and Development
- Loans and Financial guarantees
- Expedited Planning
- Public recognition and awards
- Prizes



Pricing

- Price in Externalities (Carbon Tax)
- Cost reflective tariffs
  - Dynamic Pricing
  - Fixed cost vs Variable Cost pricing

Regulation



- Align utility regulatory incentives with consumer interest
  - E.g. “decouple” profit from sales volume
- Mandatory Audits and Plans
- Mandatory information disclosure
- Minimum Energy Performance Standards

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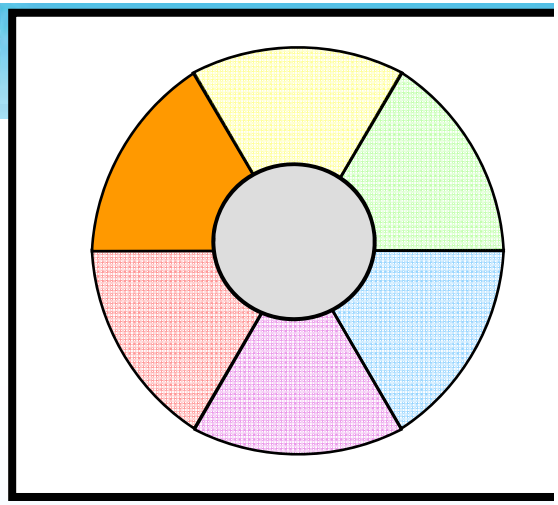
Targets



- Mandated Targets (regulated)
- Policy target (adaptive management)
- Aspirational targets (report and review)

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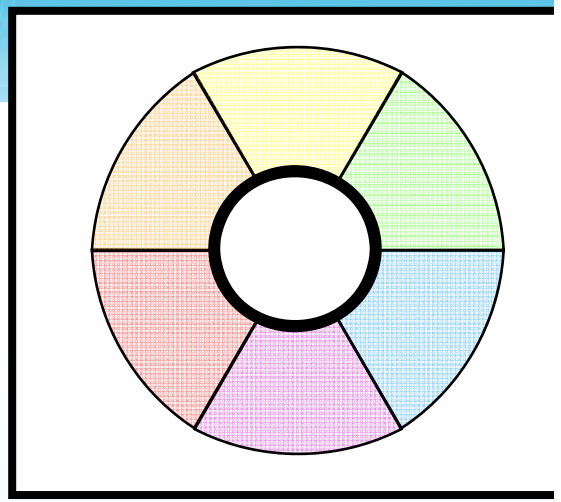
Coordination



- Strategic Planning
  - Plan, Act, Report, Review
- Interagency and intergovernmental cooperation
- Coordinating Agency

Conclusions

- Understanding institutional barriers important
  - for good policy and program design
  - to create a “licence to act”
  - to build the case for a suite of actions

- Addressing Institutional Barriers effectively requires a coordinated approach

This is a work in progress

Feedback welcome:

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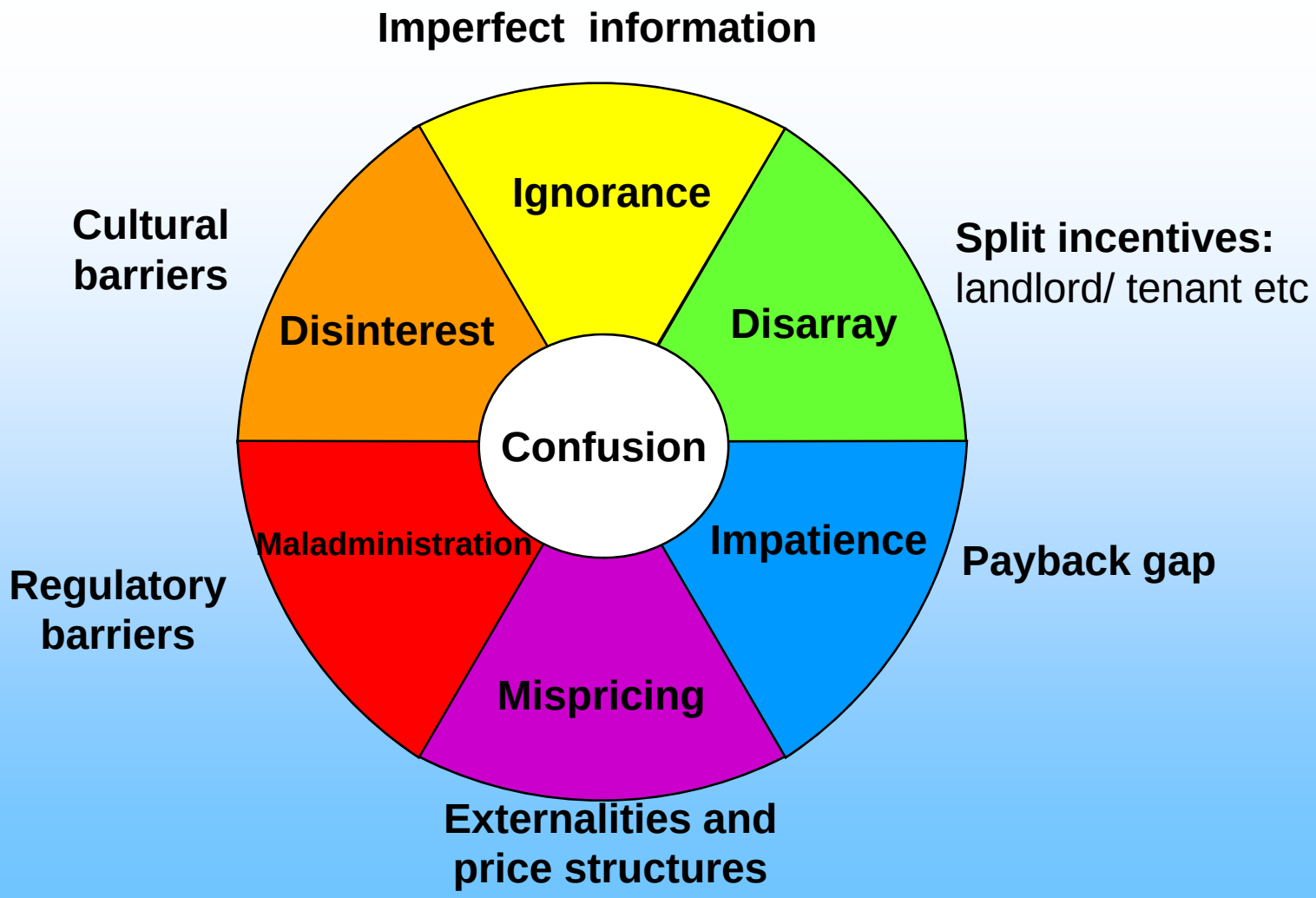
Thank you.

Barriers to Distributed Energy: "The Seven D.E. Sins"



Example: Residential Energy Efficiency

	Reg	Targets	Info	Facil'n	Incentives	Pricing
Building Shell	BASIX		NABERS, ACT Disclosure			
Heat/Cool	MEPS					
Hot Water	MEPS	GGAS			GGAS, NRET, CCF	Off peak tariffs?
White Goods	MEPS		Labelling			
Lighting	Incandescent ban	GGAS			GGAS, VEET	
Brown Goods	1W standby					