

*dynamic cities project*

design  
planning  
policy for a  
changing world



The Dynamic Cities Project (*Dialogue #5*)

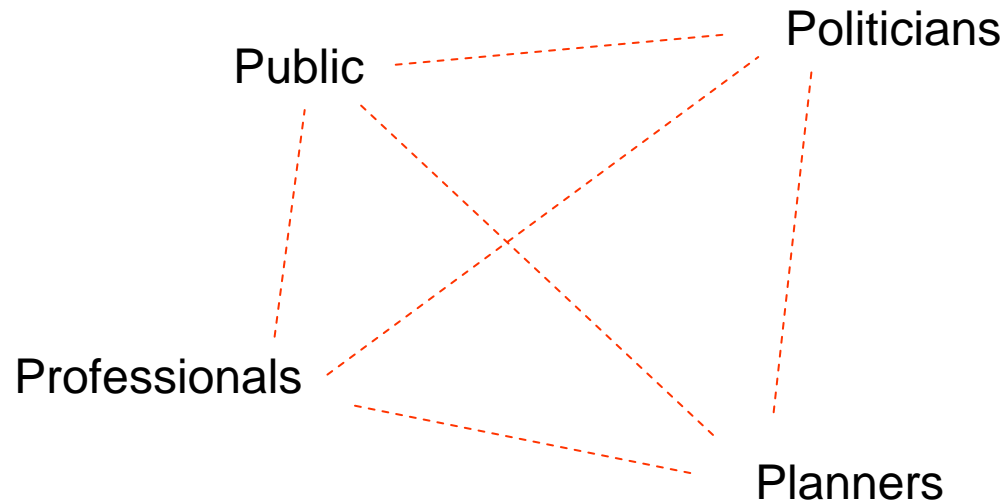
***Taking Hubbert Home:  
Moving to Regional Energy Models***

**December, 2006**

**Bryn Davidson**

The Dynamic Cities Project (*Dialogue #5*)

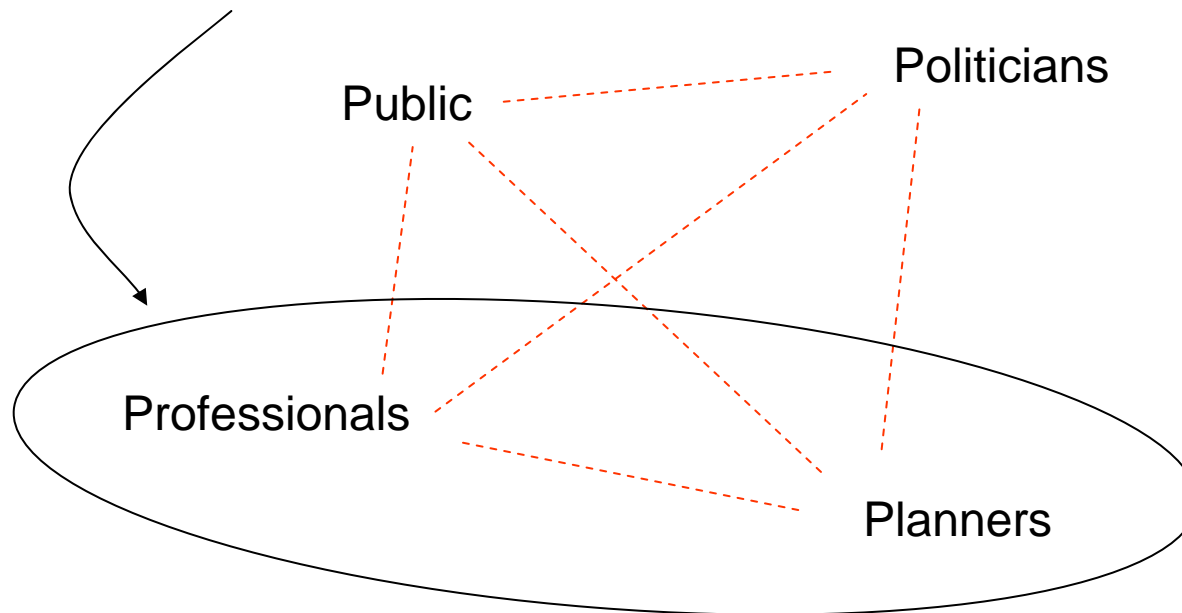
**At the *Dynamic Cities Project* we aim to weave together the various threads of the peak oil and climate change dialogue...**



The Dynamic Cities Project (*Dialogue #5*)

**At the *Dynamic Cities Project* we aim to weave together the various threads of the peak oil and climate change dialogue...**

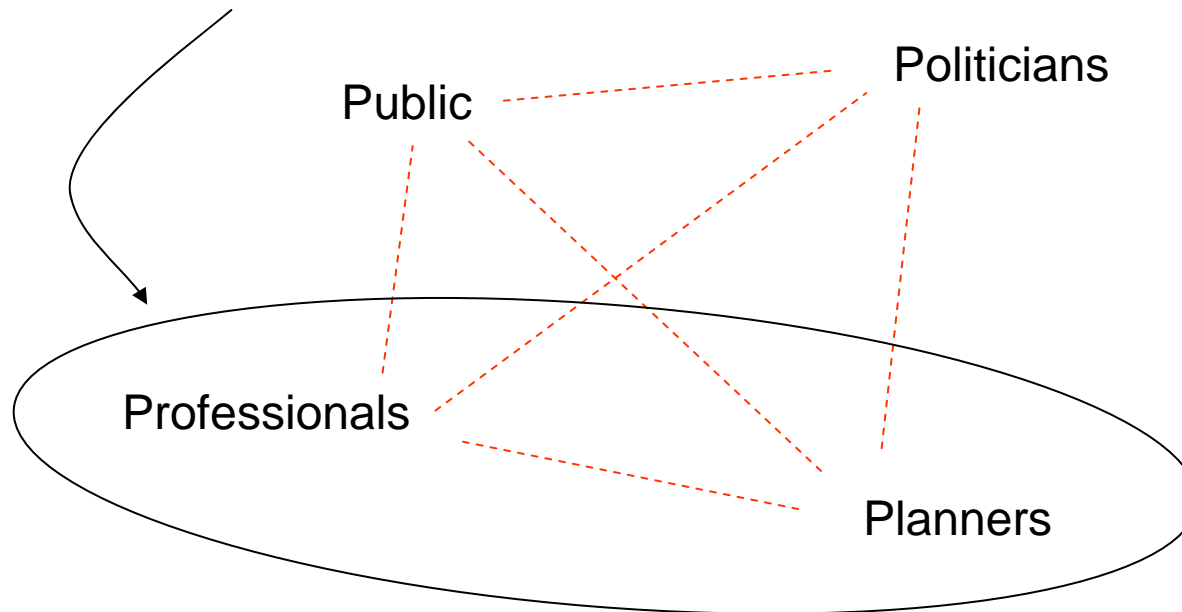
**..as planners, architects, and engineers we struggle daily to integrate this thinking into our 'real jobs'.**



The Dynamic Cities Project (*Dialogue #5*)

**At the *Dynamic Cities Project* we aim to weave together the various threads of the peak oil and climate change dialogue...**

**..as planners, architects, and engineers we struggle daily to integrate this thinking into our 'real jobs'.**



**..through these presentations we are working to craft a common and inclusive language for dealing with peak oil and climate change.**

**Thanks for joining the dialogue.**

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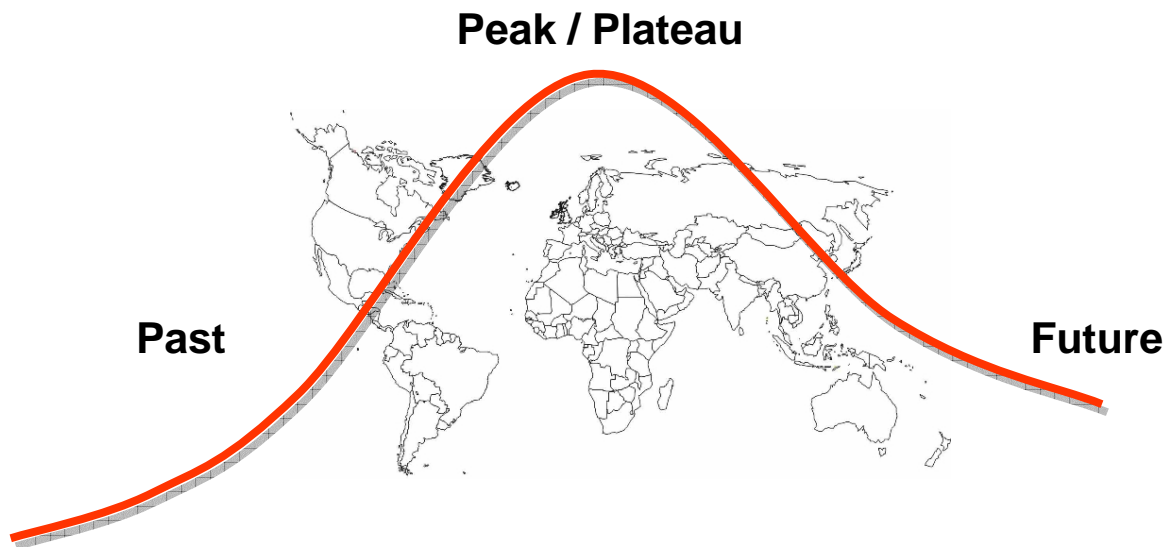
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***Taking Hubbert Home:  
Moving to Regional Energy Models***

# Global: Oil & Gas Production



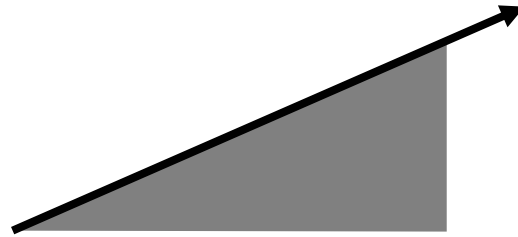
# Oil & Gas Exporting Countries: Rapidly Growing Domestic Consumption



Oil Exporters: Rising revenues, standards of living, and domestic consumption.



# Global: Rapid Growth in *Non-Market* Oil & Gas Consumption



**Rapidly Growing Domestic Consumption  
in Oil Producing Countries**  
(at subsidized, non-market prices)

1



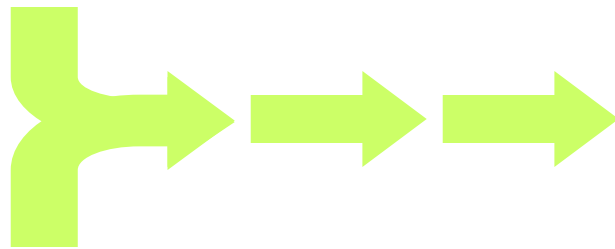
2

**Long-Term Bilateral Oil Contracts**  
(at non-market prices)

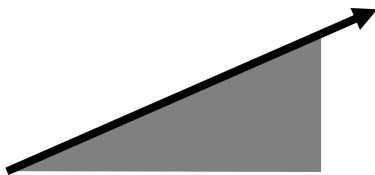


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**Global:  
Oil & Gas  
Production**



**Global:  
Rapid Growth in *Non-Market*  
Oil & Gas Consumption**



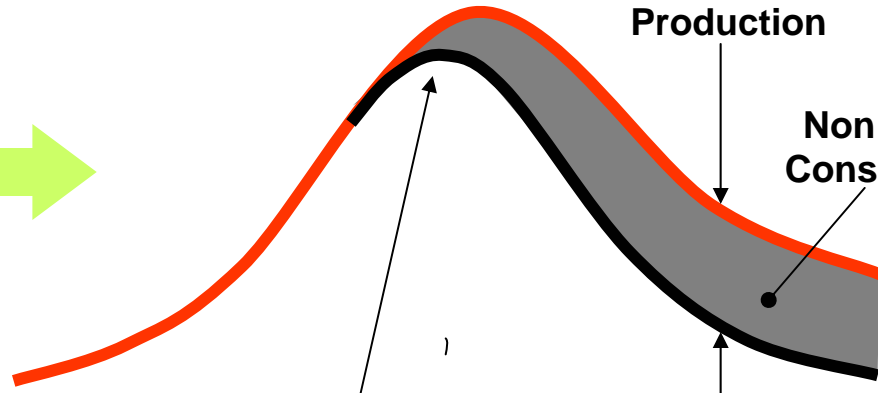
**'Peak Oil'  
for  
Producing  
/ Exporting  
Countries**

**Global Oil  
& Gas  
Production**

**Non Market  
Consumption**

**'Peak Oil'  
for Import  
Dependent  
Countries**

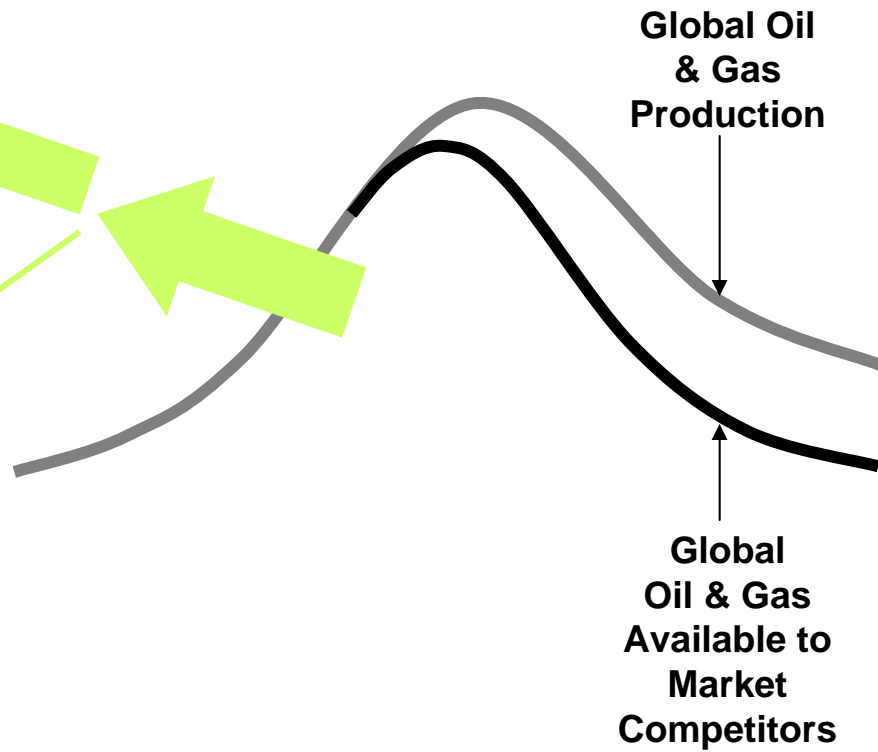
**Global  
Oil & Gas  
Available to  
Market  
Competitors**



Import Competitor 1:  
**1<sup>st</sup> World (USA)**



Import Competitor 2  
**3<sup>rd</sup> World (Guinea)**



At ~\$60 / bbl.

Import Competitor 1:  
**1<sup>st</sup> World (USA)**



USA: 'hybrid SUV'

Import Competitor 2  
**3<sup>rd</sup> World (Guinea)**



Guinea: informal carpooling – 'magbana'

Import Competitor 1:  
**1<sup>st</sup> World (USA)**



Import Competitor 2  
**3<sup>rd</sup> World (Guinea)**



~\$60 / bbl.



~\$150 / bbl.

?



?



**Producers with Nationalized Resources**



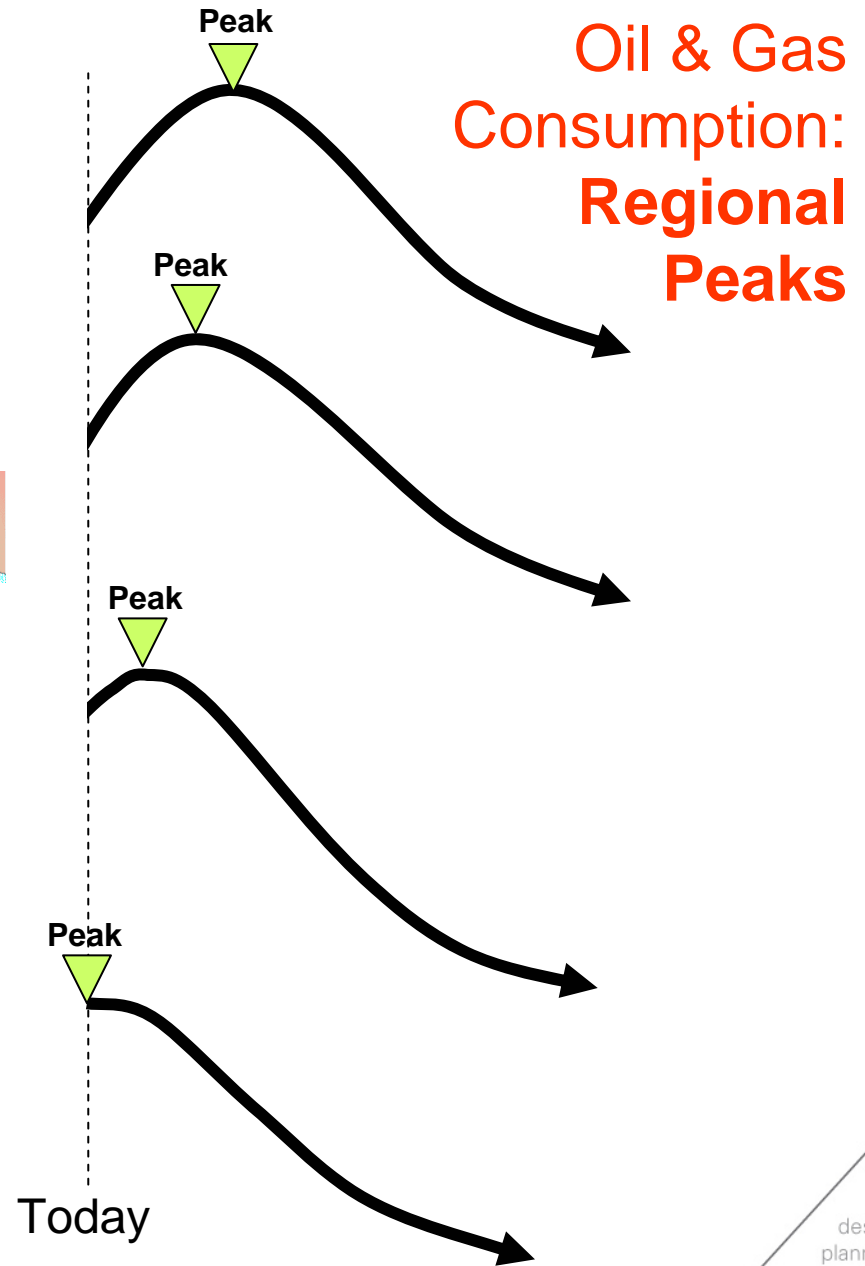
**Nations with Non-Market Trade Partners**



**Rich Import-Market Competitors**



**Poor Import-Market Competitors**

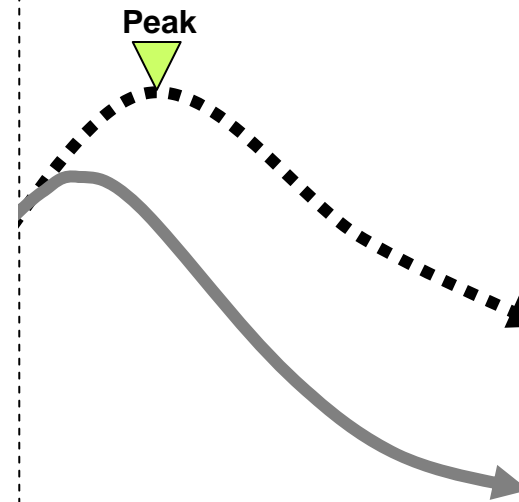


# Oil & Gas Consumption: Regional Peaks

**Rich  
Import-Market  
Competitors**



Today



**Creating New  
'Non-Market'  
Supply  
Relationships  
?**

# From Global Peak to Peak Available

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# Peak Available: 'Real World' Import Barriers

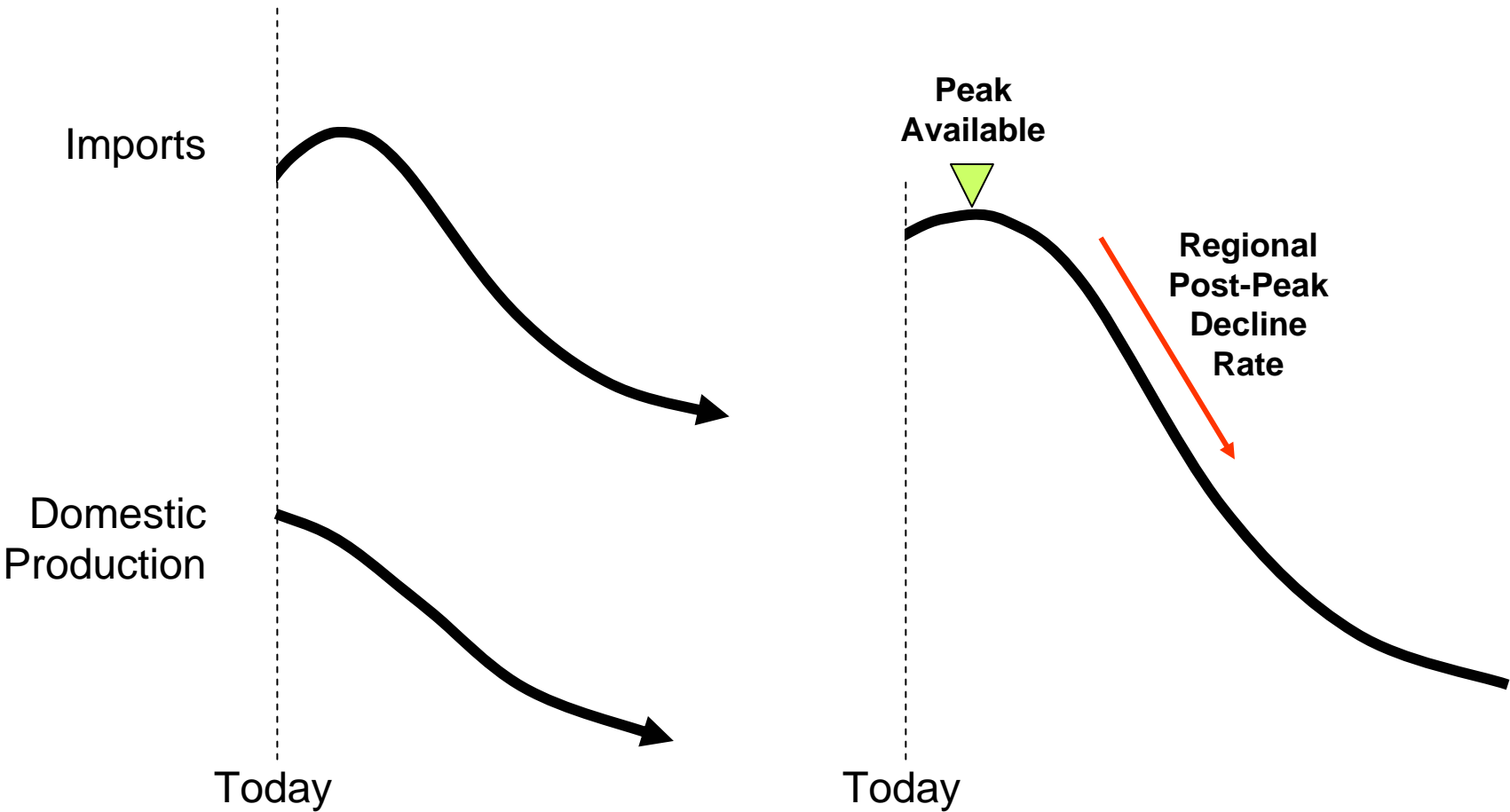
**LNG Terminals - Danger To Our Communities** Tim Riley Law .com 805-98

Consumer Protection Attorney Tim Riley Warns About **L**iquefied **N**atural **G**as  
Certified Member of the Million Dollar Advocates Forum "The Top Trial Lawyers in the County"

- \* NIMBY
- \* Environmental Constraints
- \* Hurricanes
- \* Terrorism
- \* Embargo
- \* 'Under Investment'



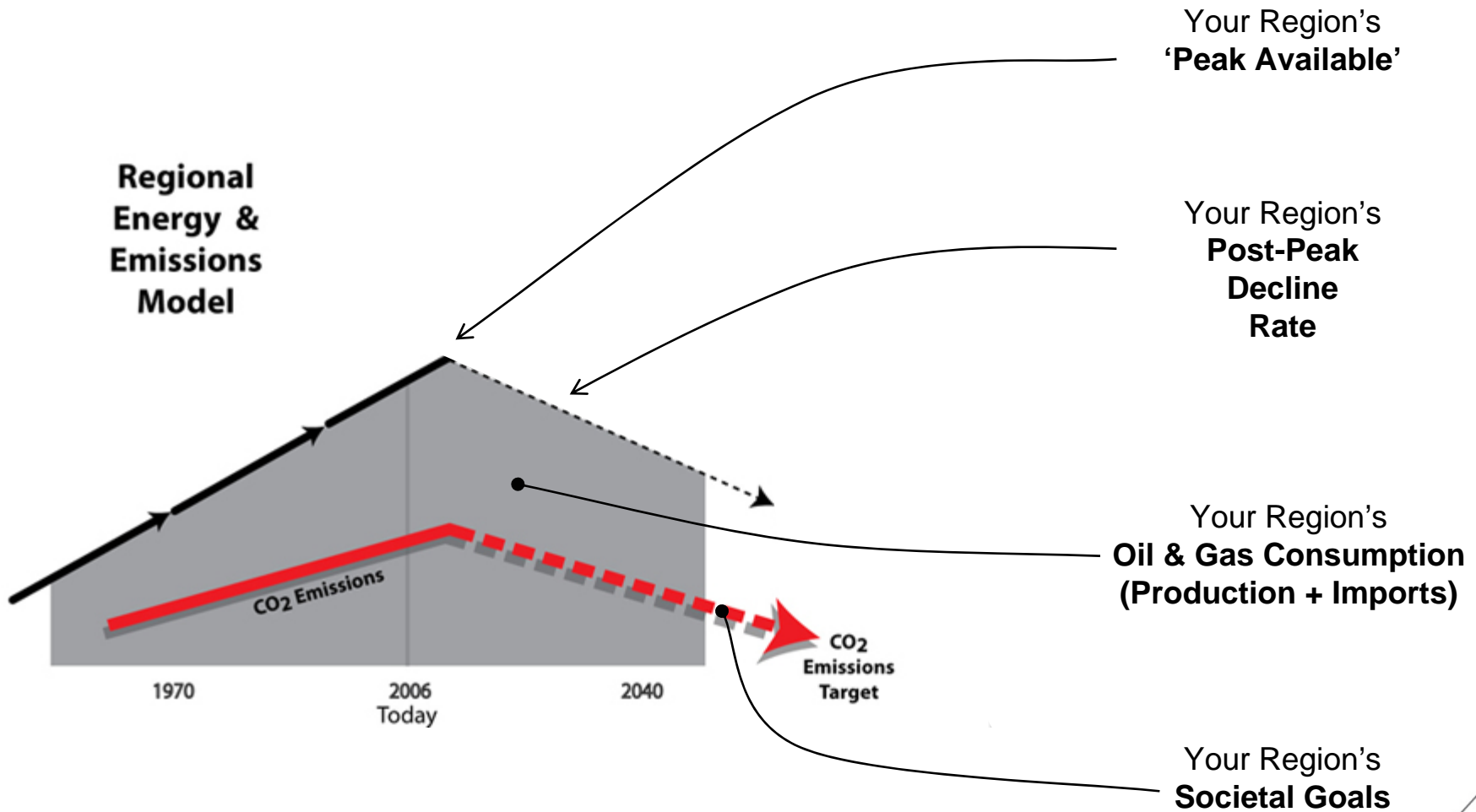
# Peak Available: Regional Production + Imports



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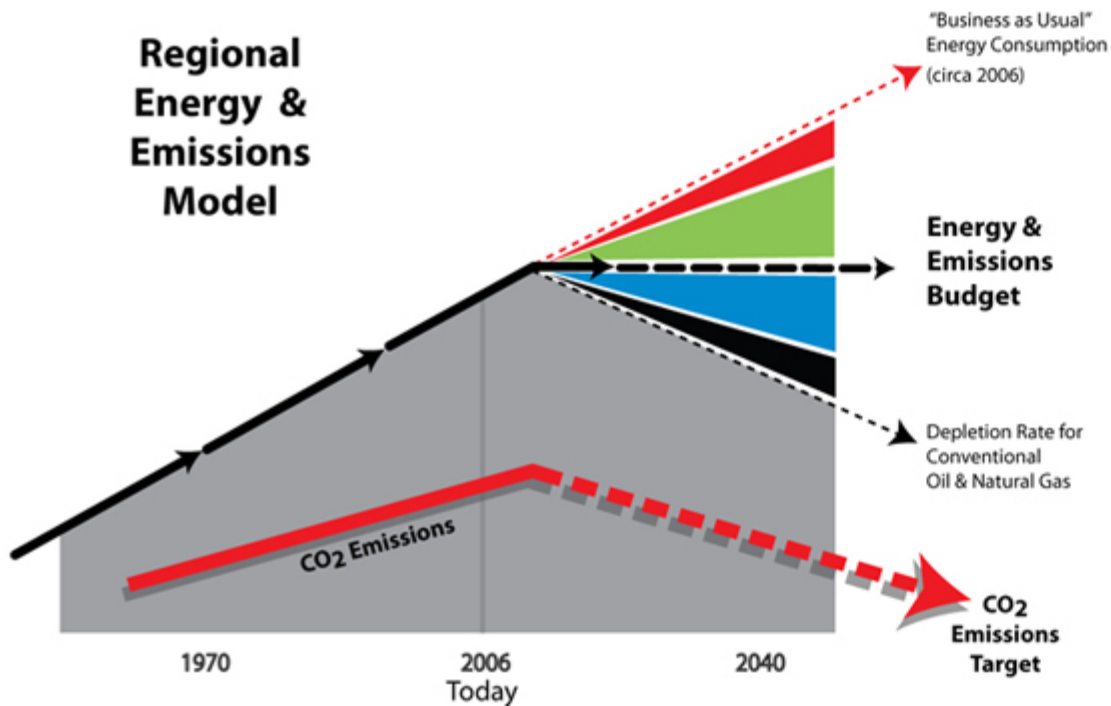


# Regional Energy Model: Post Peak Decline, Emissions & Mitigation



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# Regional Energy Model: Post Peak Decline, Emissions & Mitigation



## Demand-Side Mitigation Wedges

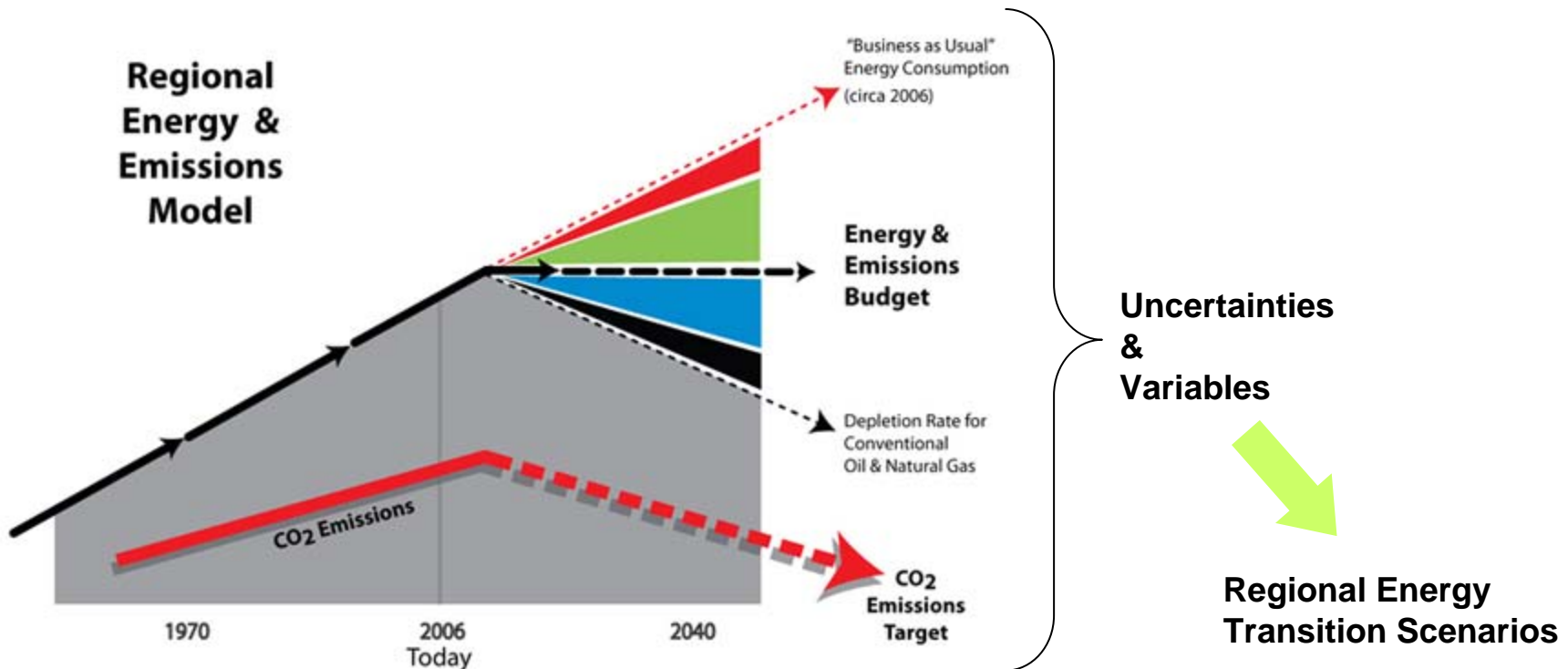
-  **Demand Destruction**  
(Reactive: Higher Prices & Shortages)
-  **Demand Reduction**  
(Proactive: Policy & Design)

## Supply-Side Mitigation Wedges

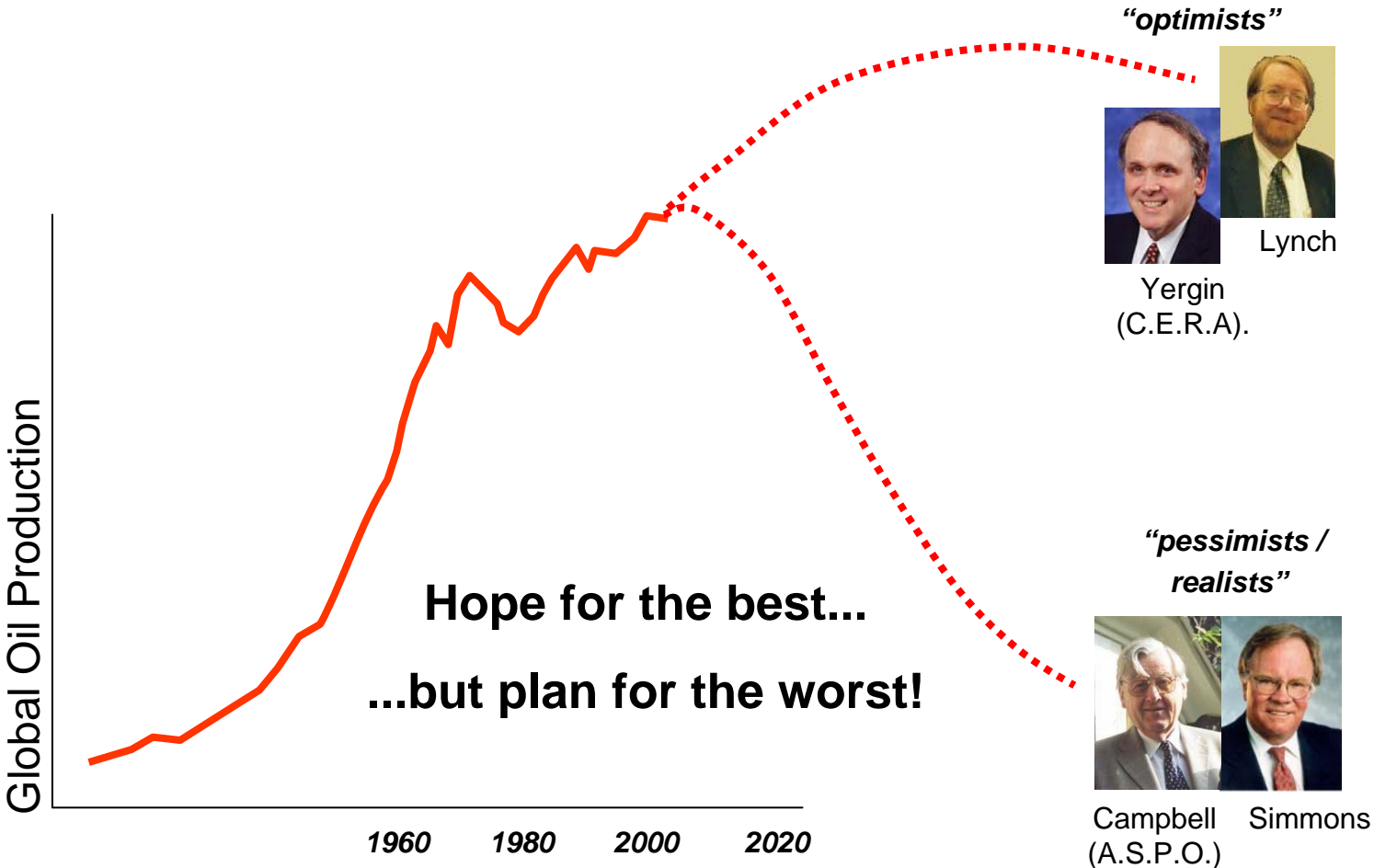
-  **New Clean Energy Supply**  
(Carbon Neutral & Sustainably Sourced)
-  **New Dirty Energy Supply**  
(Lowest Price)

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# Regional Energy Model: Post Peak Decline, Emissions & Mitigation



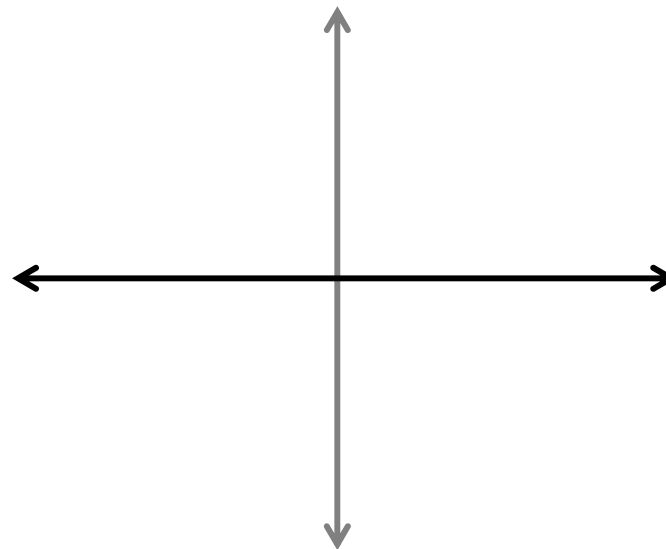
# Regional Energy Model: Dealing with uncertainty...



# Regional Energy Model: Transition Scenarios

'Peak Available': 2010

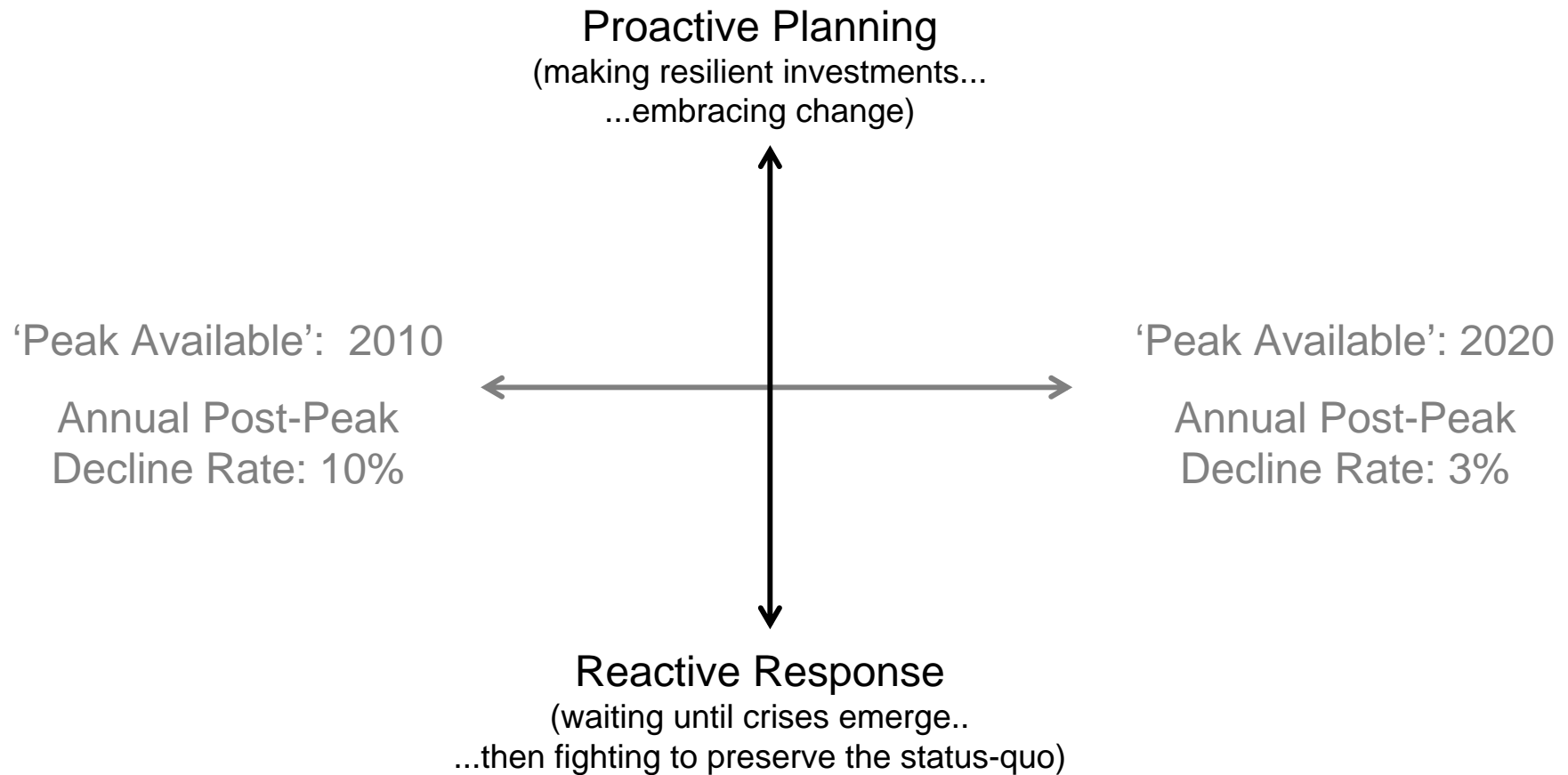
Annual Post-Peak  
Decline Rate: 10%



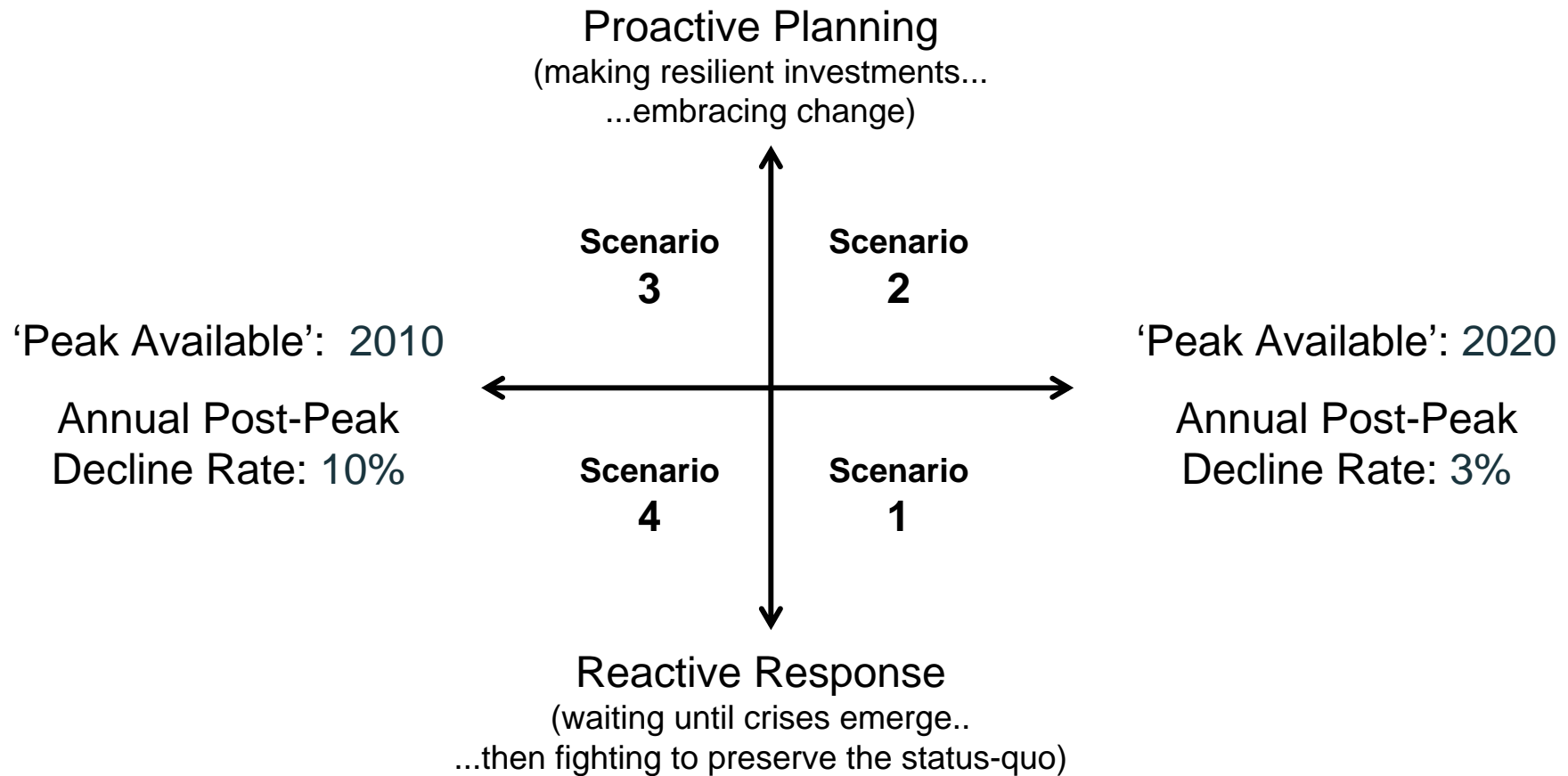
'Peak Available': 2020

Annual Post-Peak  
Decline Rate: 3%

# Regional Energy Model: Transition Scenarios



# Regional Energy Model: Transition Scenarios



## From *Energy Model* to *Energy Transition Strategy*:

### Global Oil & Gas Depletion Model



Global Oil & Gas Production  
Non-Market Oil & Gas Consumption  
Global Exports

### National Oil & Gas Depletion Model



National Production  
Imports:  
- Share of Global Export Market  
- Non-Market Barriers to Importation

### Regional Energy Model

Regional 'Peak Available' Date  
Post-Peak Decline Rate  
CO<sub>2</sub> / GHG Budget  
  
Demand-Side Mitigation Wedges  
Supply-Side Mitigation Wedges

# From Energy Model to Energy Transition Strategy:

## Global Oil & Gas Depletion Model



Global Oil & Gas Production  
Non-Market Oil & Gas Consumption  
Global Exports

## National Oil & Gas Depletion Model



National Production  
Imports:  
- Share of Global Export Market  
- Non-Market Barriers to Importation

## Regional Energy Model

Regional 'Peak Available' Date  
Post-Peak Decline Rate  
CO2 / GHG Budget  
Demand-Side Mitigation Wedges  
Supply-Side Mitigation Wedges

**Uncertainties  
&  
Variables**



**Regional Energy  
Transition Scenarios**

Societal  
Goals



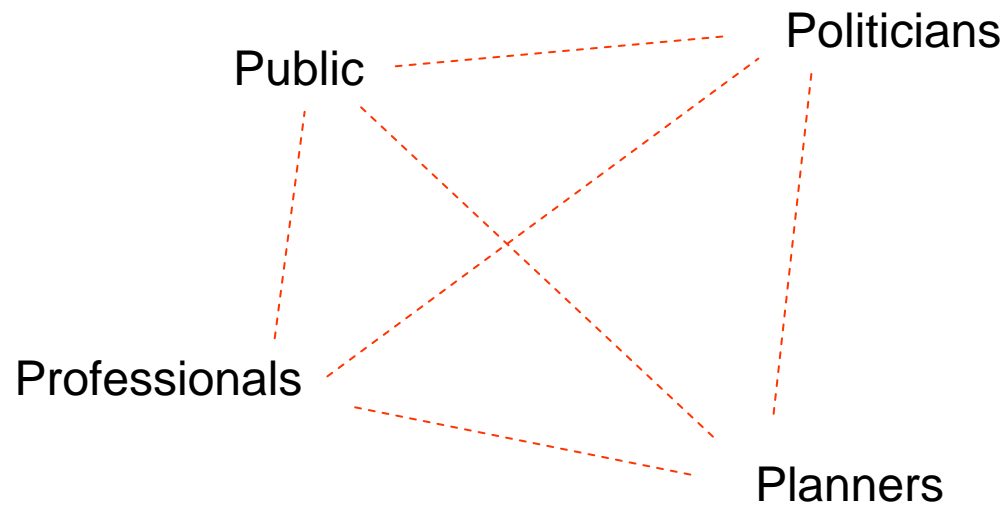
## Regional Energy Transition Strategy

- \* Demand-Side Transition Strategy
- \* Supply Side Transition Strategy
- \* Environmental Goals
- \* Contingency Plans

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## Getting There:

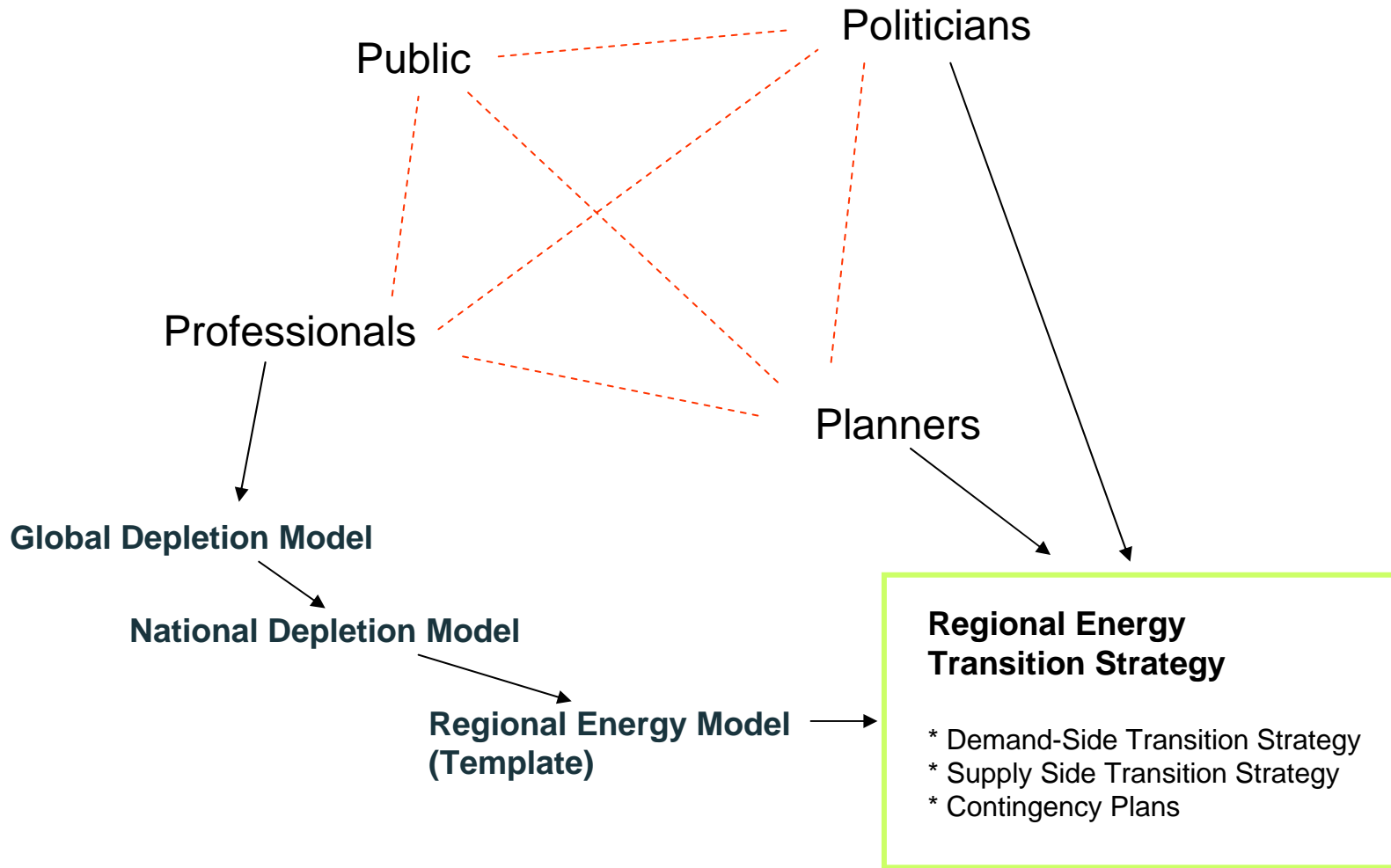
A road map for developing local energy transition strategies



### Regional Energy Transition Strategy

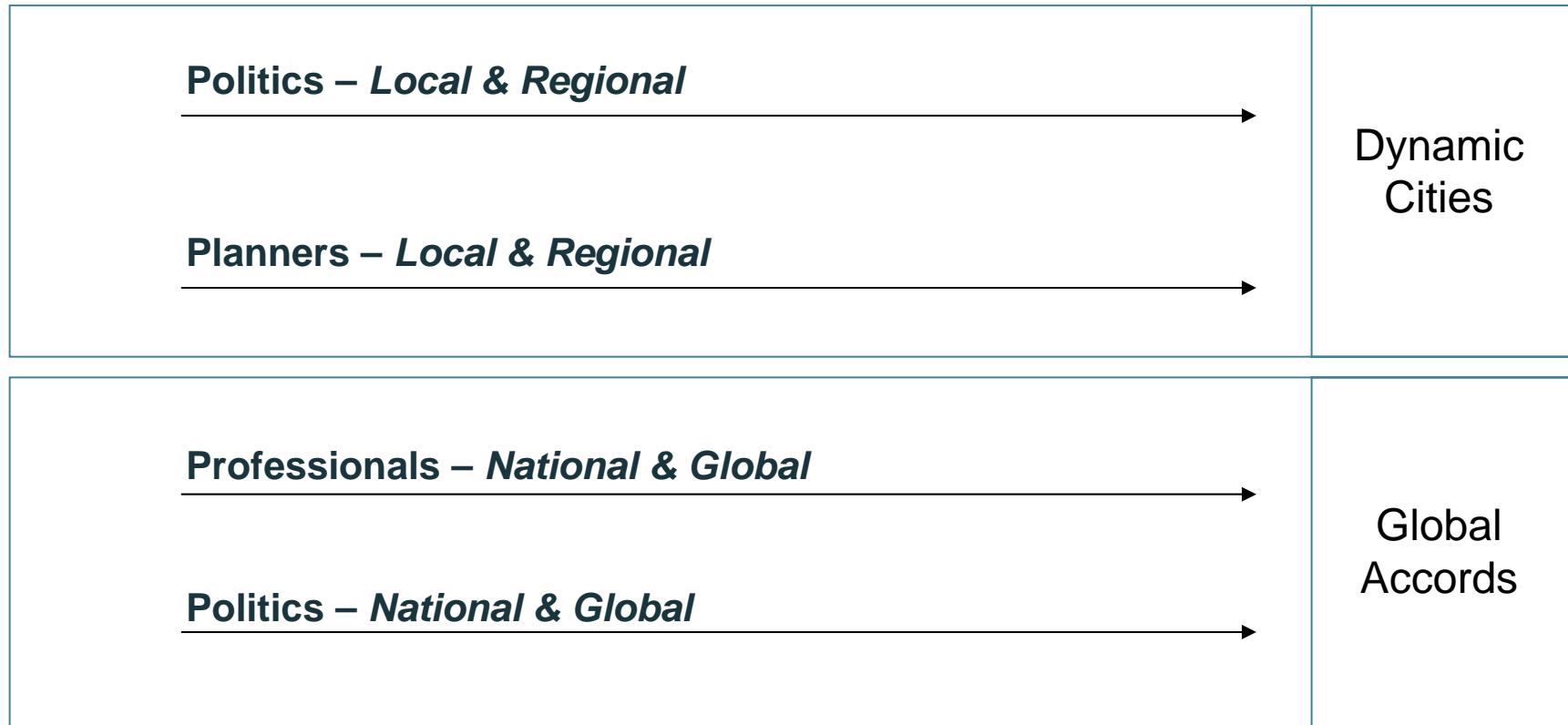
- \* Demand-Side Transition Strategy
- \* Supply Side Transition Strategy
- \* Environmental Goals
- \* Contingency Plans

# Getting There: A road map for developing local energy transition strategies



# Getting There:

A road map for developing local energy transition strategies



# Getting There: A road map for developing local energy transition strategies

## A Road Map to the Dynamic City:

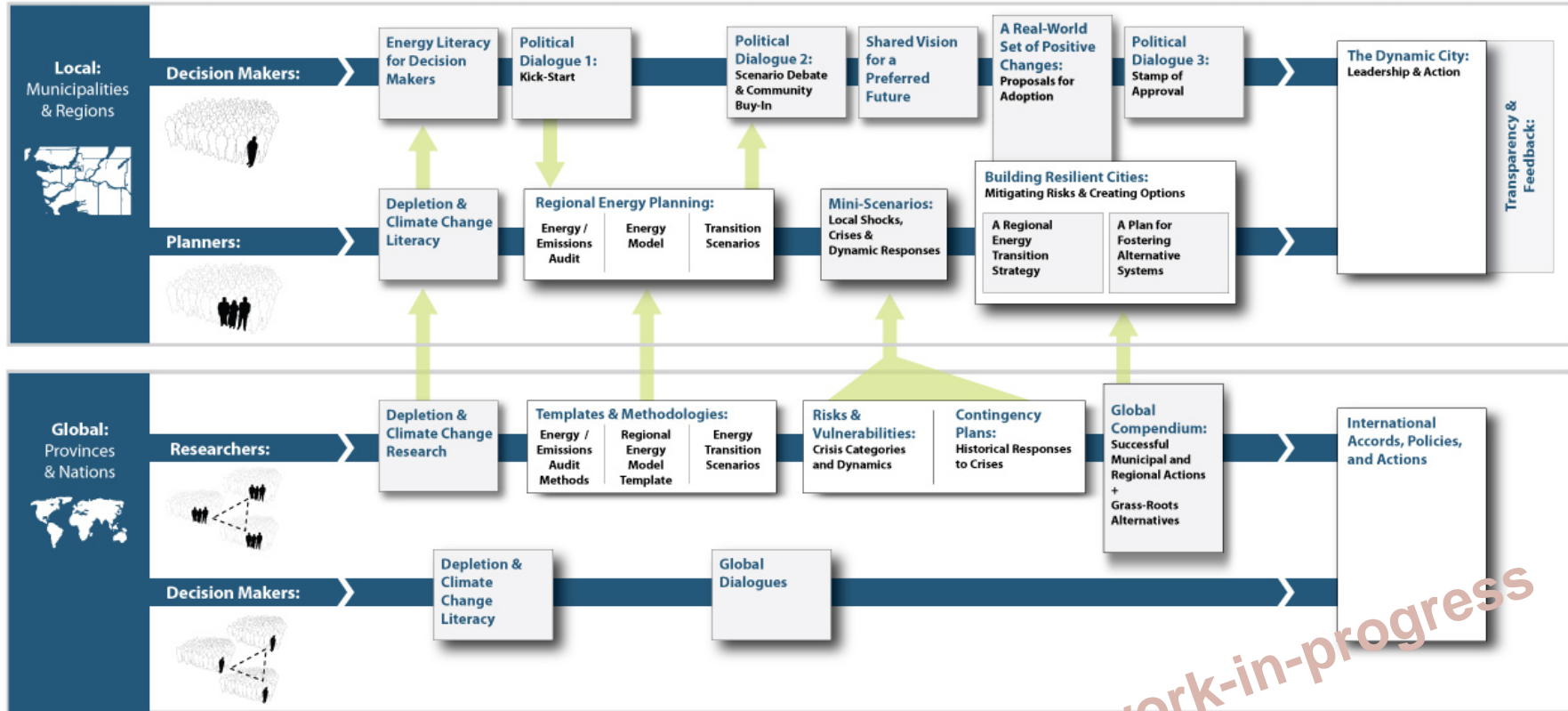
A process model for integrating the impacts of climate change and energy depletion into community and regional planning.

(v.3.4) Dec 7, 2006

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urban ideas for a lively future

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2006 Bryn Davidson - RAO/D Cityworks - developed for the Dynamic Cities Project



# Getting There: A road map for developing local energy transition strategies

## A Road Map to the Dynamic City:

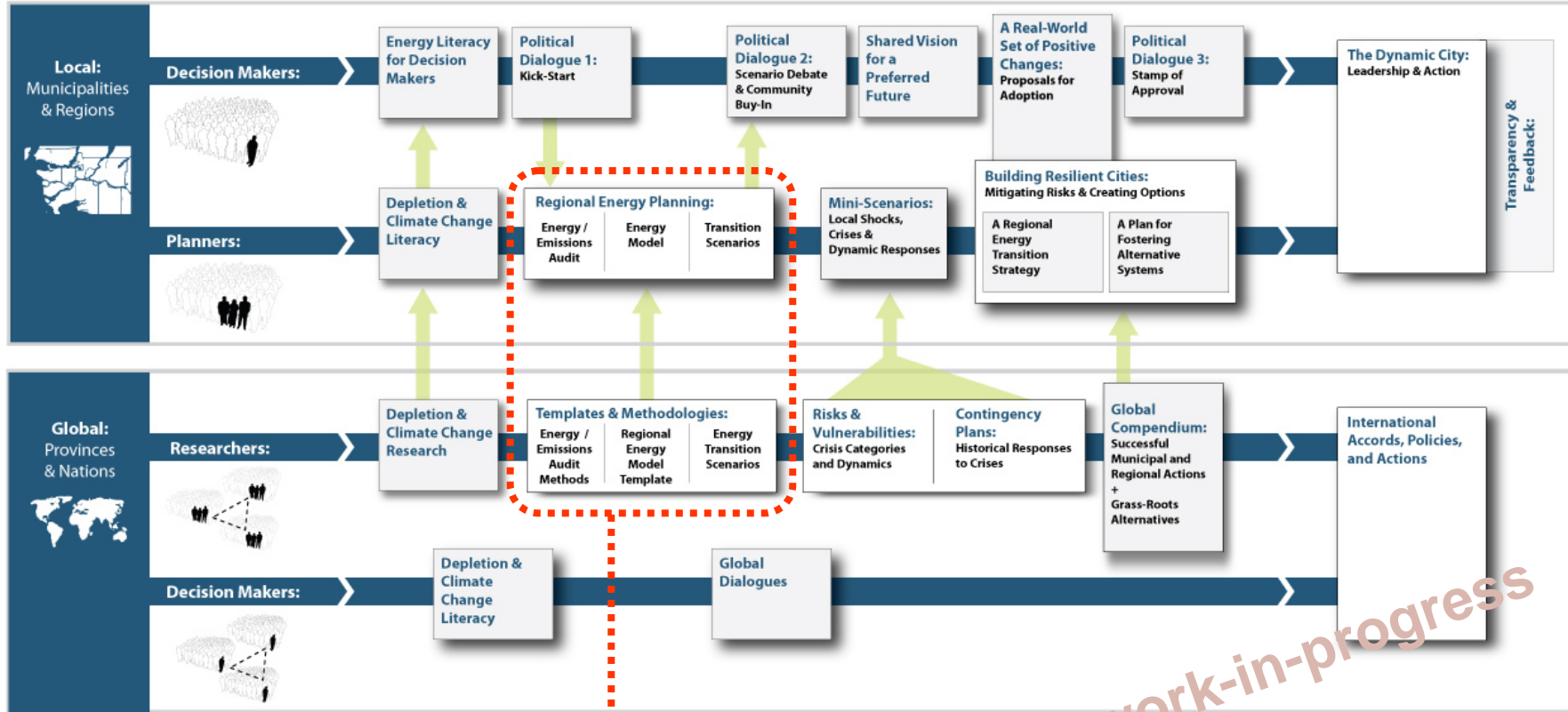
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This presentation (Dialogue 5) nested within the broader discussion...

The Dynamic Cities Project (*Dialogue #5*)

## ***Taking Hubbert Home: Moving to Regional Energy Models***

- 1. Every region faces unique challenges regarding their future supply of oil and gas.***
- 2. Every region has different options for mitigating depletion.***
- 3. We need a toolkit that can be quickly adapted and adopted by local planners.***

The Dynamic Cities Project (*Dialogue #5*)

## ***Taking Hubbert Home: Moving to Regional Energy Models***

***Thanks for contributing!***

***Comments: [bryn@dynamiccities.org](mailto:bryn@dynamiccities.org)***

### **Recent DCP Dialogues:**

#### **Dialogue 1 – Energy Transition Literacy**

***Peak Oil Planning - A Graphic Essay*** ([ppt](#), [energy bulletin](#))

***Peak Oil: Navigating the Debate*** ([ppt](#), [webslides](#), [energy bulletin](#))

#### **Dialogue 2 – Energy Transition Scenarios**

***Our Future(s): 4 Energy Transition Scenarios*** ([ppt](#), [energy bulletin](#))

***Scenario Coaster*** ([ppt](#), [energy bulletin](#))

#### **Dialogue 3 – Crisis and Risk**

***Crisis and Risk: Categories and Mental Maps*** ([pdf](#), [energy bulletin](#))

#### **Dialogue 4 – A Road Map to the Dynamic City**

***A Road Map to the Dynamic City v.3.4*** ([jpeg](#))