Initial Tasks Discussion

APEC Energy Outlook 5th Edition

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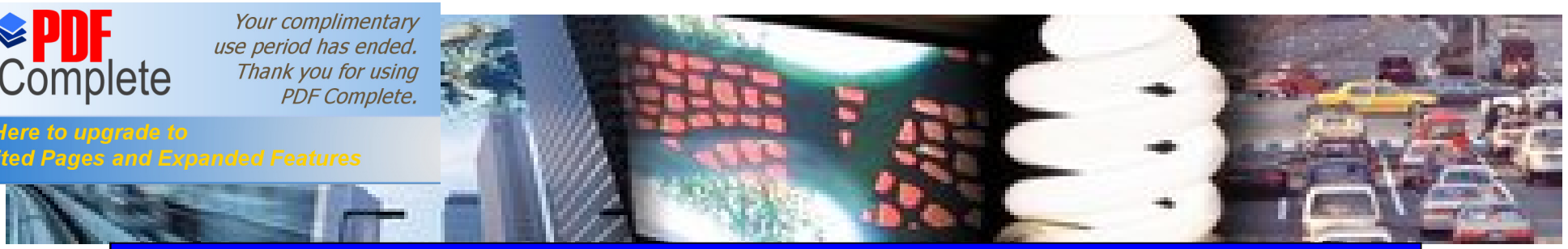
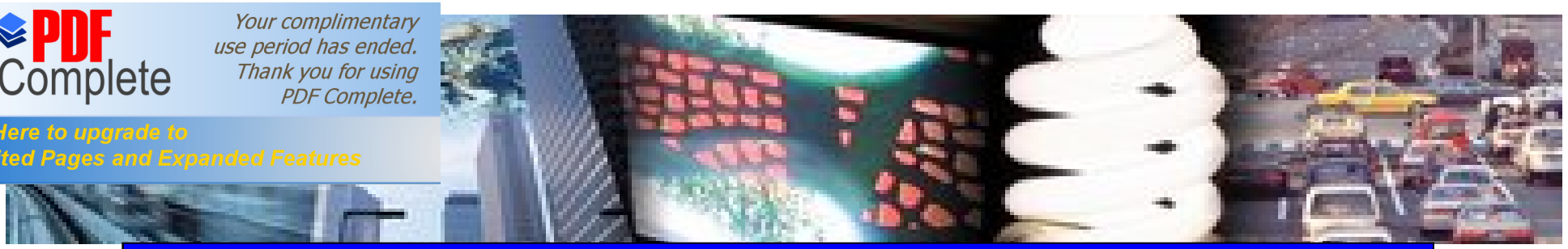
Asia-Pacific Economic Cooperation



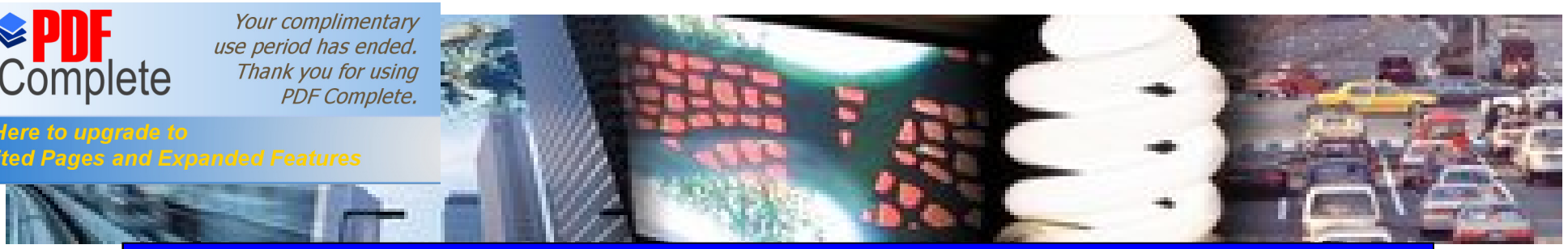
Initial Caveats

- **The purpose of this meeting is to decide what initial tasks for Outlook 5th Edition to undertake and who should undertake each one**
- **This is a discussion presentation:**
  - It contains my initial thoughts, reflecting on previous discussions and presentations
  - Nothing on the initial tasks has been decided yet
  - Your ideas and suggestions are most welcome



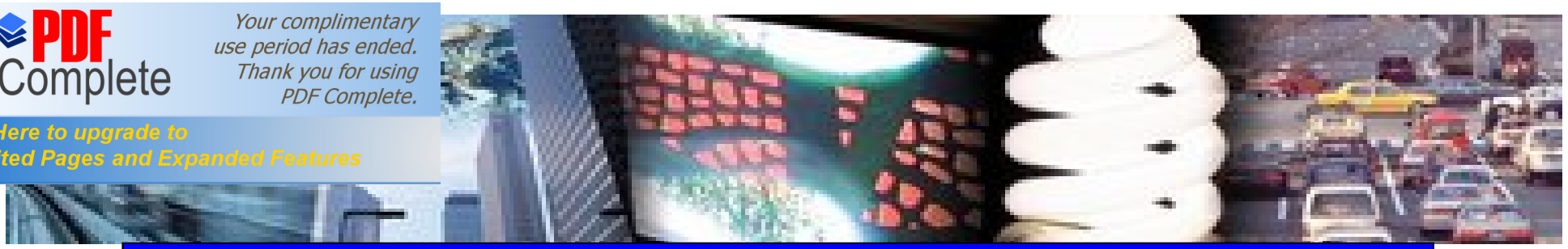
Initial Tasks ï Overview

- **Demand modeling**
  - Define our modeling approach
  - Demonstrate its feasibility
- **Alternative cases definition**
  - Define what kind of results we are looking for
  - Define what cases we wish to examine
  - Define how we could model these cases
- **Above are interrelated—can't define one without the other**
- **Deemphasize supply side for the time being**



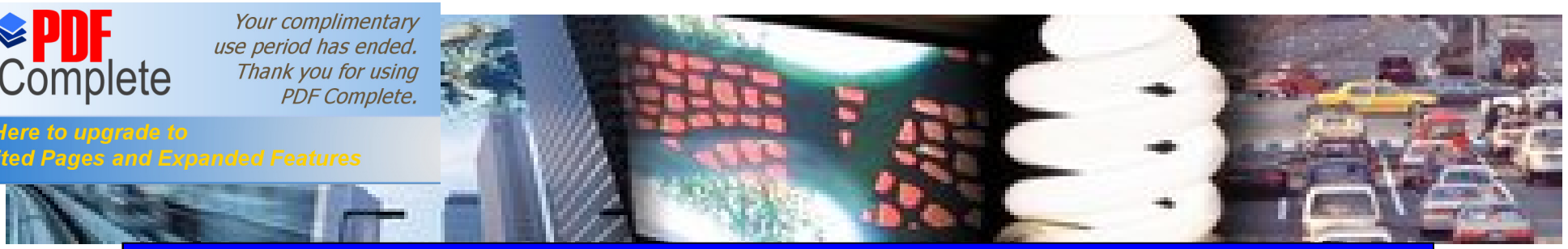
Overall Project Plan

- **Initial tasks (by sector?)**
  - Specify models
  - Specify cases
  - Test for two economies
- **Implement software (LEAP or SimpleE) for models and cases (by sector?)**
- **Later Tasks (by economy)**
  - Estimate models for each economy
  - Estimate cases for each economy
  - Write Volume 2 reviews



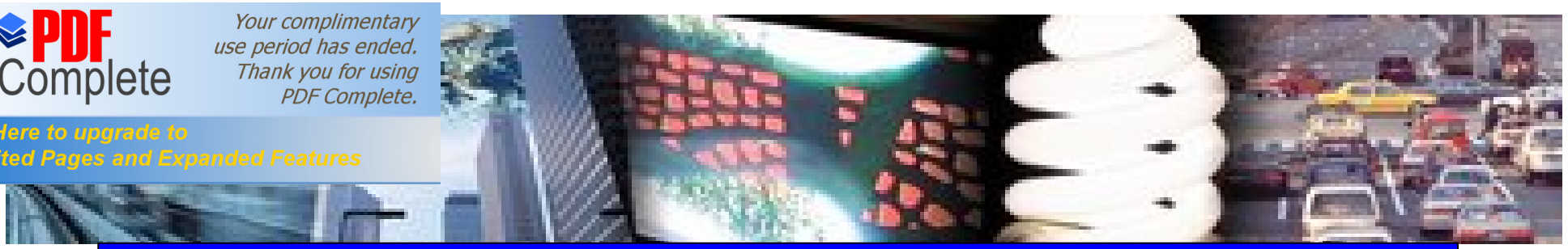
Decision: Time Horizon

- **APEC Outlooks have historically made 25 year projections**
- **However, climate change is a longer-range problem**
  - **Should we make longer projections? Say to 2050?**
  - **Clearly, projecting availability and costs of technology in 2050 is impossible**
  - **However, we can do some interesting 'what-ifs' that can demonstrate the value of investing in research on certain technologies**



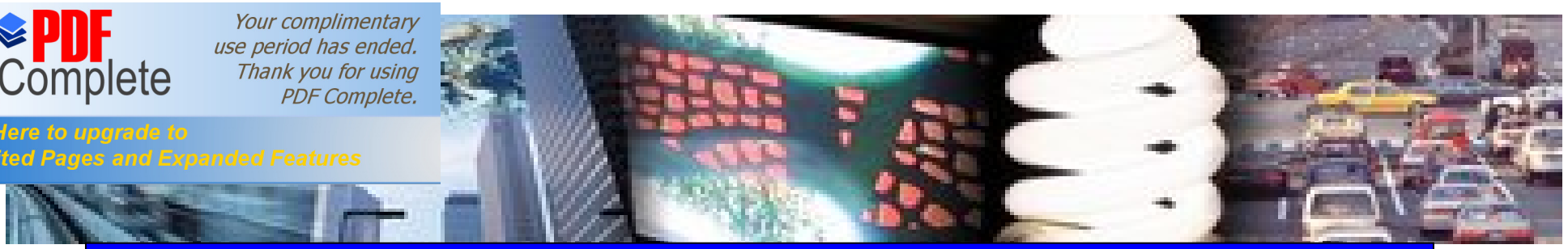
Time Horizonð a Suggestion

- Do projection to 2050
- Consider two types of cases
  1. Those that can be implemented now
  2. Those that we may be able to implement in a few years, given appropriate research efforts



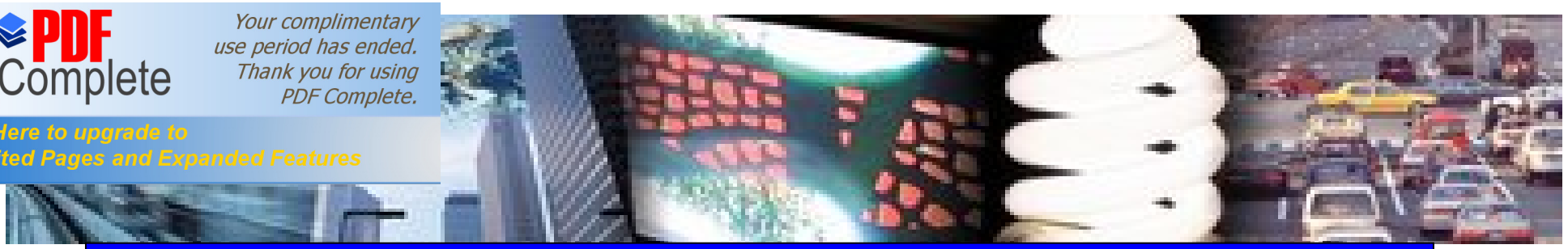
Needed Demand Modeling Approaches - 1

- **Industrial energy**
  - Iron & steel
  - Non-metallic minerals
  - Break-out other industries?
  - Remaining industry
- **Non-Energy**
- **'Other Demand'**
  - Residential
  - Commercial/Public Services
  - Agriculture/Fishing
  - Non-specified



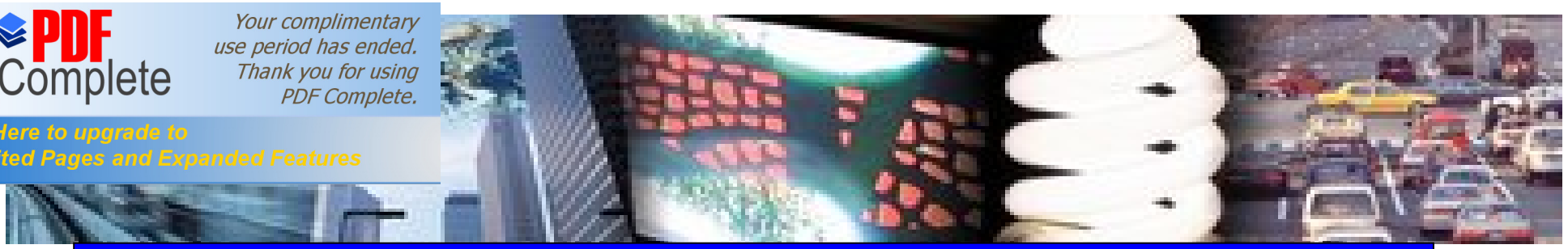
Needed Demand Modeling Approaches -2

- **Transport Energy**
  - Light vehicles
  - Other transport (passenger and freight)
    - Heavy road vehicles
    - International aviation
    - Domestic aviation
    - Rail
    - International marine
    - Domestic navigation
    - Other



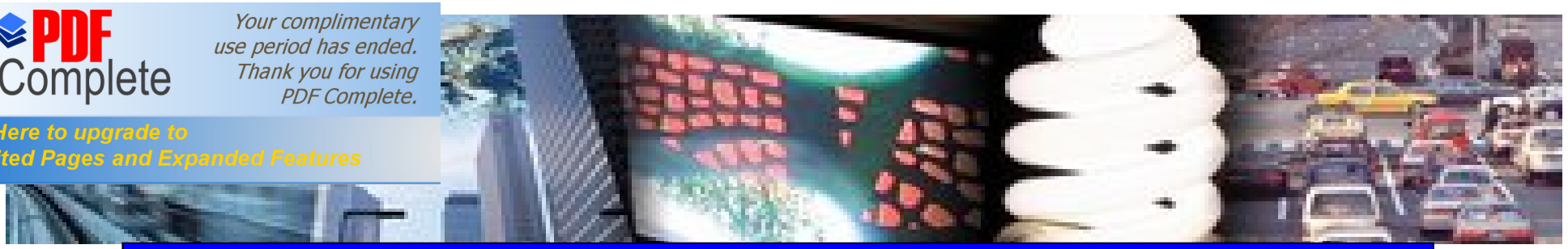
Focus on at Least Two Economies

- **APEC economies span a broad spectrum ranging**
  - **From those with lots of data and lots of modeling literature**
  - **To those with relatively little data and little modeling literature**
- **Suggest that we first conceptually demonstrate our models on at least two example economies—one from each of these categories**

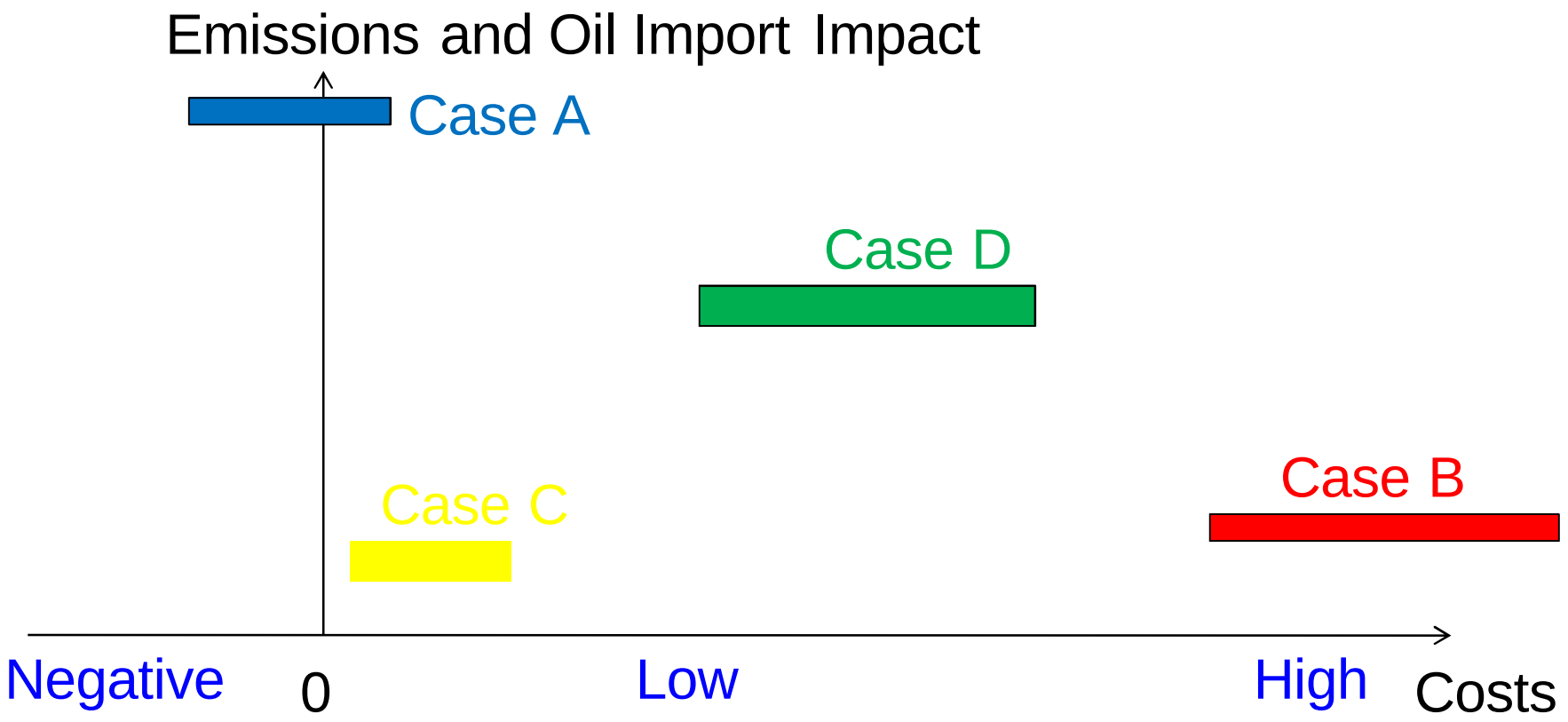


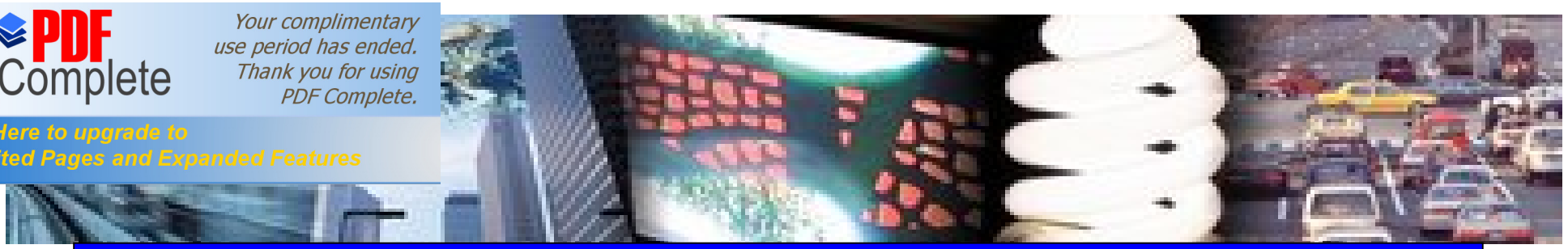
Tasks for Each Demand Model

- **On July 9 – First brainstorming workshop on initial tasks**
  - Initial literature review on modeling approaches
  - Initial proposal for modeling approach
- **By 28 July – Second brainstorming workshop on initial tasks**
  - Your proposal for how to model demand for at least two economies, including
    - Proposed model specification
    - Data you would use to estimate the model
    - No need to actually estimate the model



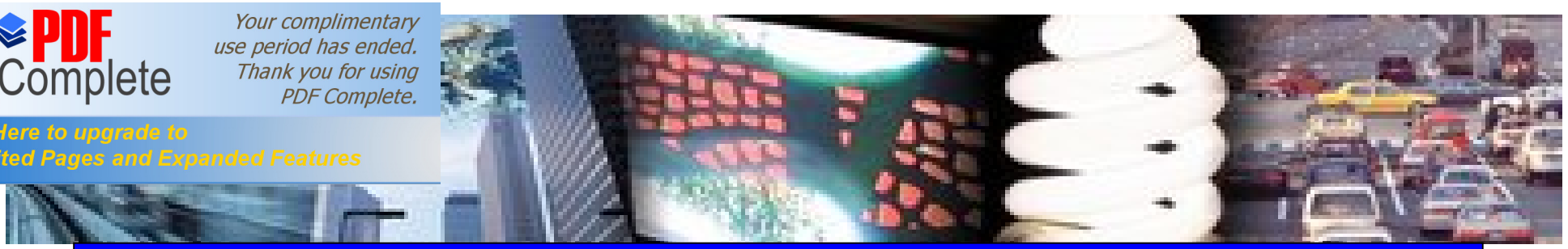
Alternative Cases - What Kind of Results We Are Looking For?





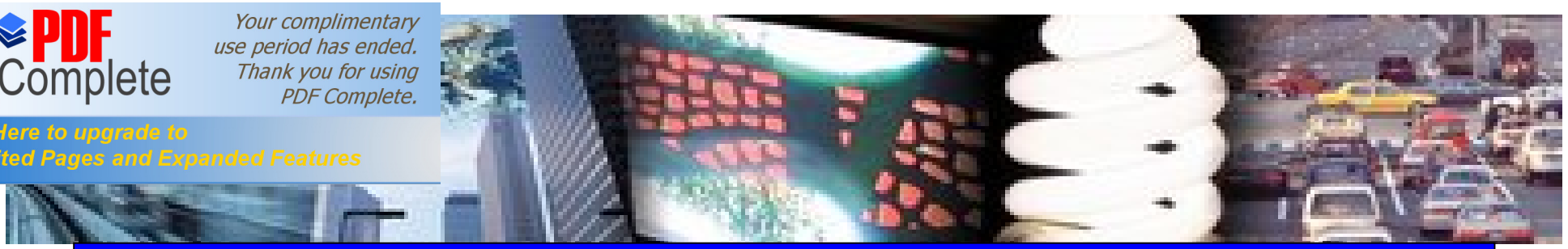
Economy-Specific Cases

- **Specific economies may have specific opportunities to improve their sustainability**
- **Examples:**
  - Develop specific renewable resources
  - Reform electricity tariffs that discourage renewables
  - Eliminate certain subsidies
  - Provide financing for energy efficiency improvements
  - Change land-use planning practices
- **Can we make a list of some of these for each economy?**



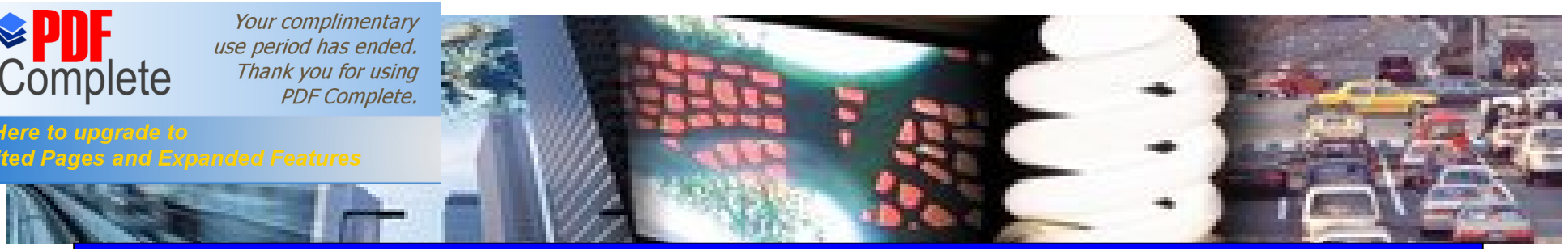
Decision: Organize Cases by Economy or by Measure?

- **Organize by Economy**
  - Pros
    - Can think about unique characteristics of each economy
  - Cons
    - Duplication of effort across economies
    - 21 economies x number of measures
- **Organize by Measure**
  - Pros
    - Can focus more attention on each measure
  - Cons
    - May miss some economy-specific opportunities



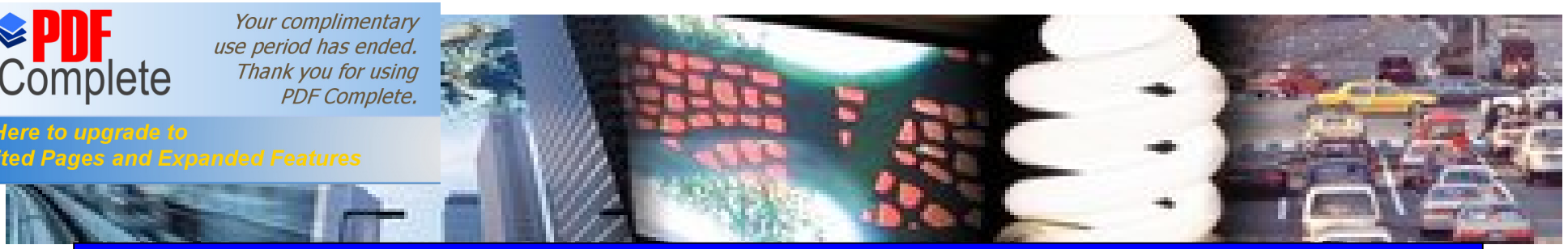
Tasks for Each Set of Alternative Cases

- **On July 9 – First brainstorming workshop on initial tasks**
  - Initial literature review on cases
  - Initial proposal for cases approach
- **By 28 July – Second brainstorming workshop on initial tasks**
  - Your proposal for what cases to model for at least two economies, including
    - Proposed implementation of case in sector model or off-line model for case
    - Data you would use to estimate the case
    - No need to actually estimate the case



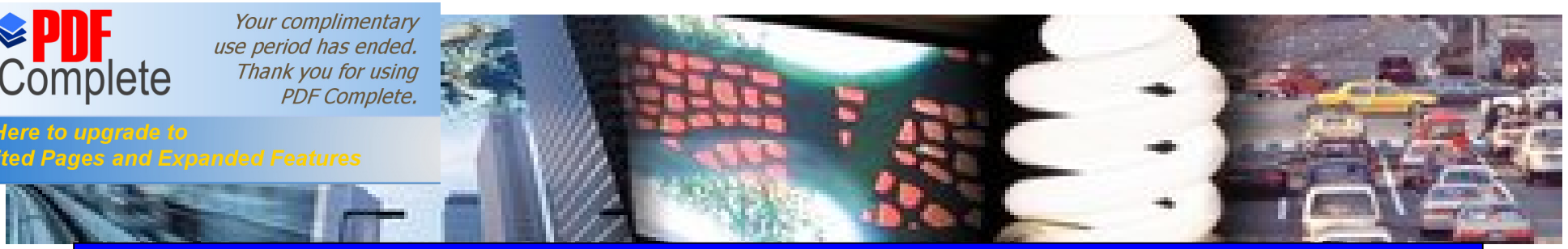
Possible Cases ï Transport

- Transport Vehicles/Fuels
  - Conventional vehicle fuel economy standards
  - Electric vehicles/plug-in hybrids
  - Biofuels
  - Natural gas vehicles
- Transport Demand Management
  - Congestion road pricing
  - Eliminate fuel subsidies/raise fuel taxes
  - Transit-oriented development
  - Telecommuting
  - Freight modal shift



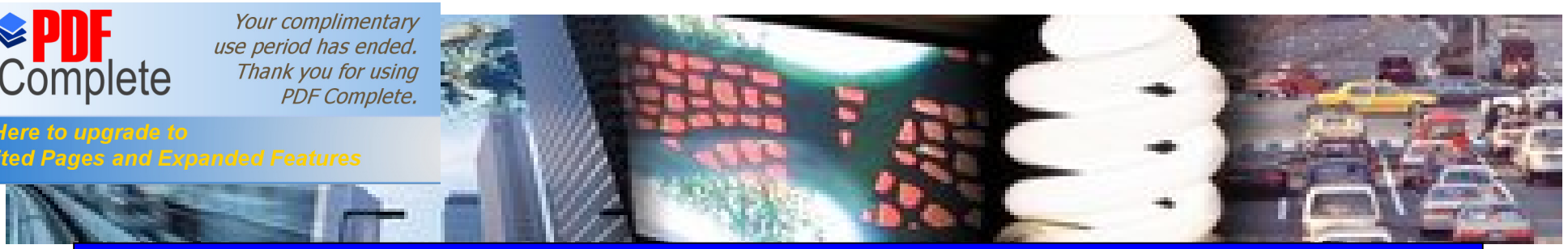
Possible Cases ï Industrial Demand

- Technologies Solutions
  - ï Efficiency standards for motors and common industrial equipment
  - ï Change steel or cement technologies
  - ï Increased use of cogeneration/waste heat recovery
- Industrial Demand Management
  - ï Mandatory energy management
  - ï Transition to less energy-intensive industry



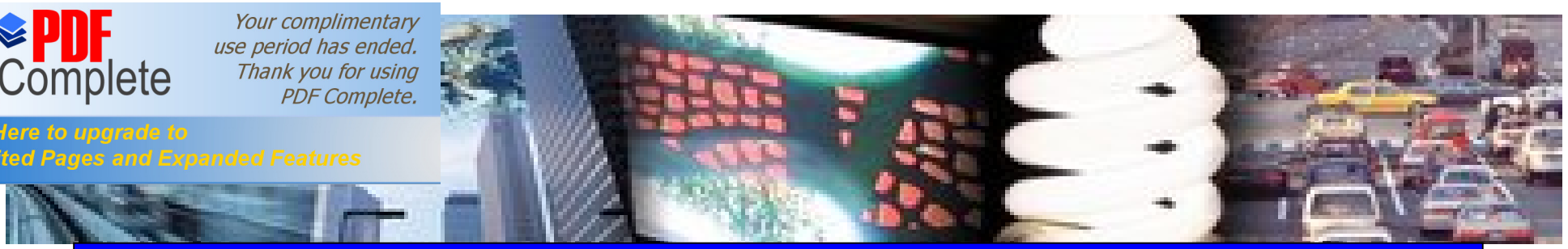
Possible Cases ï Residential/Commercial Demand

- Technological solutions
  - Energy efficiency standards for buildings
  - Energy efficiency standards for appliances
  - Solar water heaters
- Demand management
  - Time of day electricity pricing



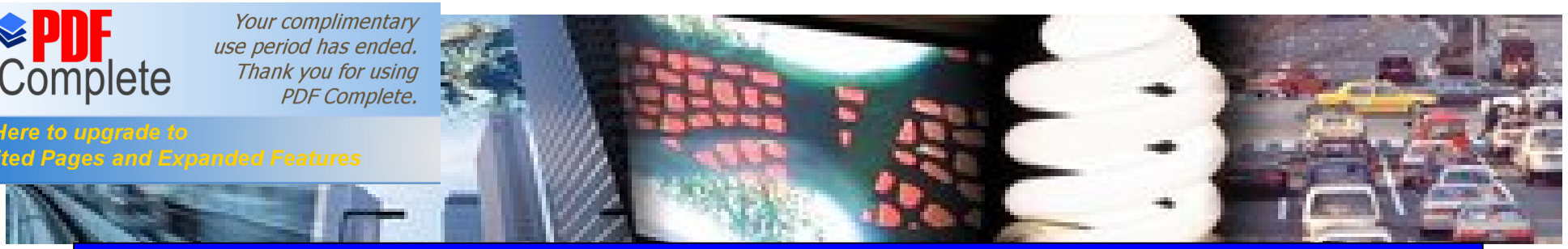
Possible Cases ï Supply Side

- Technologies
  - ï More intensive development and deployment of renewables
    - A number of possible cases here
  - ï More nuclear
  - ï CCS
  - ï Replacement of coal with gas in electricity generation
    - Unconventional gas
  - ï Electricity storage
- Supply management
  - ï Time of day electricity pricing
  - ï Carbon taxes



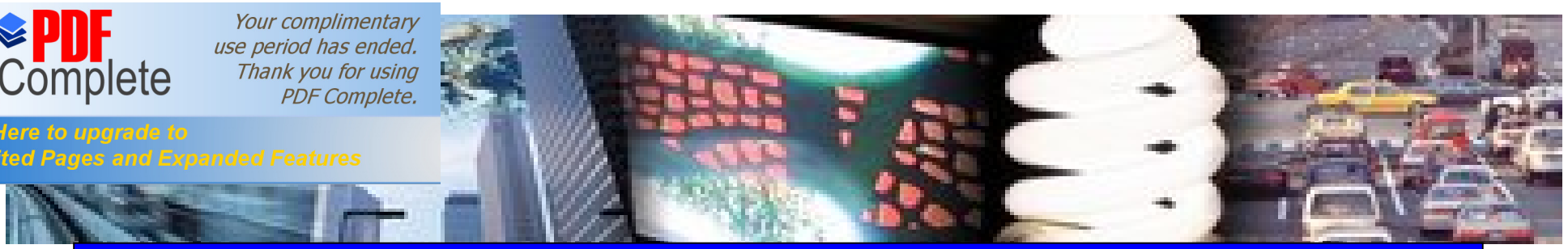
How to Model Energy Impact of a Case

- **How many units will be affected by the case?**
  - Examples:
    - Number of vehicles
    - Number of homes
    - Number of tonnes of output
- **On average, how will each unit be affected? (Δ energy)**
- **Energy Impact = Units x Δ energy**



How to Model Cost Impact of a Case

- **How many units will be affected by the case?**
  - Examples:
    - Number of vehicles
    - Number of homes
    - Number of tonnes of output
- **On average, how will each unit be affected? (Δ cost)**
- **Cost Impact = Units x Δ cost**



Possible Breakout of Tasks

	Model	Literature Review	Alternative Cases
Transport ï Light Vehicle Demand			
Transport ï Other Demand			
Industrial Demand			
Other Demand	Zhang		Zhang
Electricity Supply	Huang		
China			Zhang