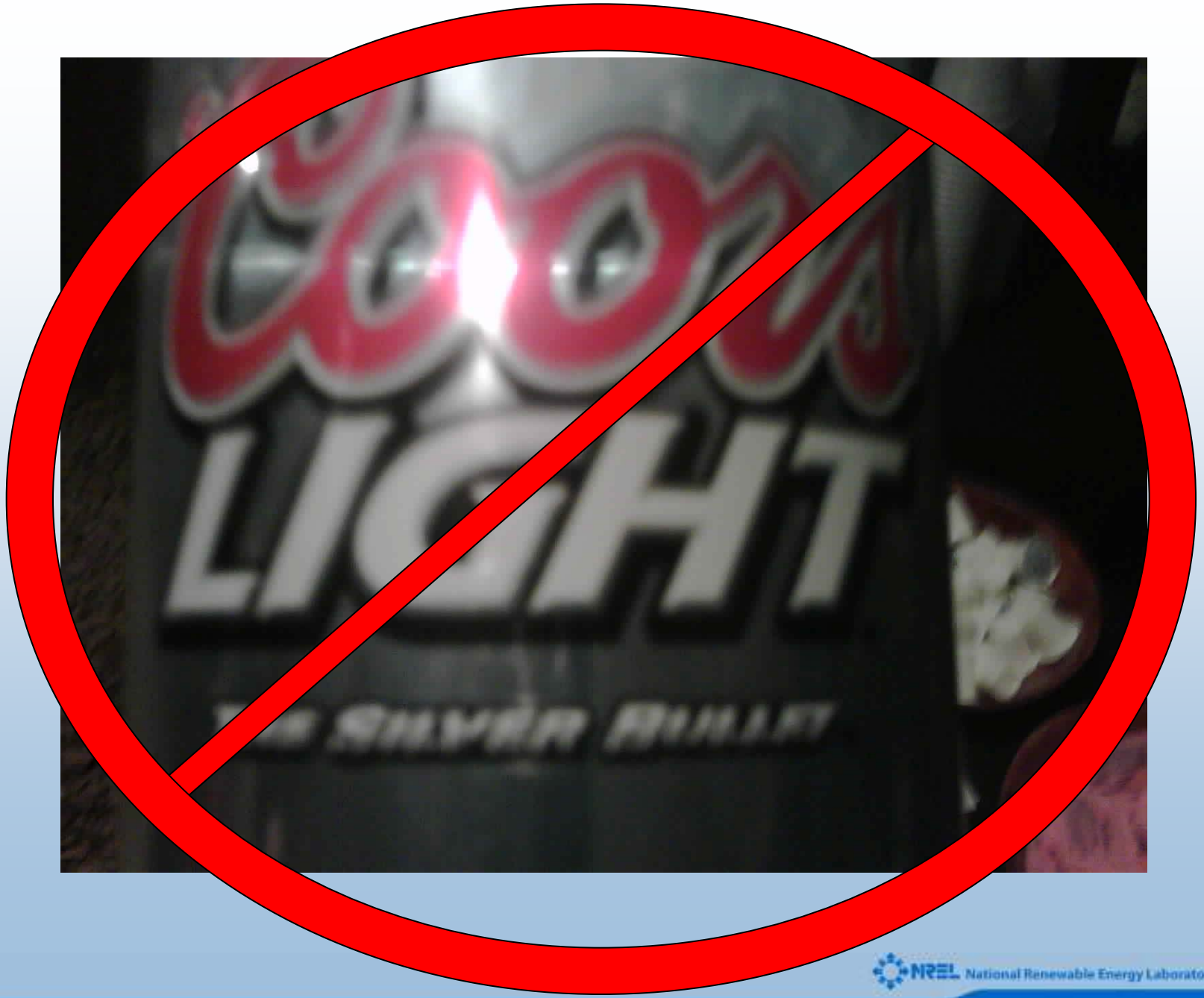
Modeling Renewable Energy Technologies in IAMs for Mitigating Future Climate Change

CCI/IA
Snowmass

August 2009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Motivations…

- Goal: Bring together energy economic modelers and IAM modelers to discuss the state of the art and research area needs for improving the representation of RE technologies for climate modeling.
- State of Modeling & Knowledge
- Create global community of EE/RE modeling experts & link with IAM community

Draft Multiyear Concept

- 2009:
- Present state of art for RE and EE modeling and impact of capturing the techno-economic characteristics in IAMs via a case study. Case study will be of the U.S..
- Discuss improvements to approach and layout plan for global effort (regionally based?) to apply best in class approach.
- Identify research teams for each region and coordination plan

- 2010
- Review case study results from other regions for enhanced energy economic modeling . Complete 25% of regions.
  - Publish Initial case study results
- Review IAM results with improved RE/EE results

- 2011
- Complete 50% of regions for enhanced RE/EE modeling
  - Publish Special Journal of results
- Complete integration of techno-econ characteristics in IAMs
- Review initial comparative IAM results

- 2012-2013
- Complete 100% of regions and comparative assessments of IAM scenarios with updated RE tech-economic characterization.
  - Publish comparative results from multiple IAMs with updated RE characterizations.
- Recommend path forward for next phase of work.

2009 Agenda

- Day 1:
- 9 am- Introductions, Goals of the Workshop and overview of multiyear concept;
  - D Arent; J. Weyant

- 9:30 Overview of IAM treatment of RETs
  - Session/Discussion Leader: J. Weyant

    Presenters: Detlef VanVuuren (Env of Netherlands),
    Keywan Riahi (IIASA)
- 10:30 Break
- 10:45- 12:15: Overview of IAM treatment of RETs
  - Session/Discussion Leader: J. Weyant

    Presenters: Leon Clark (PNNL)
    Elmar Kreigler, (PIK)
    Toshi Masui (NIES)
- Lunch
- 1 pm to 2.30 pm: Status of RE Resource Assessment Globally

  Session/Discussion Leader: David Kline, NREL

  Presenters:

  Riso/DTU: Hans Ejsing Jørgensen--wind
  Dave Renne, NREL—solar
  Ralph Overend- Bioresources

2009 Agenda

- Day 1 con't:
- 2.30 pm to 3:30 pm Modeling the integration of RETs into utility operations

  Session/Discussion Leader: P. Denholm, NREL

  - US Studies: Erik Ela, NREL
  - EU Studies: Kenneth Karlsson, DTU/Risoe
- Break

- 4- 5:30 pm Case study: Modeling RETs in the expansion of electric sector capacity

  – Geospatial Electric Sector Capacity Expansion Modeling and High Penetration Scenario results

  Session/Discussion Leader: Rob Lempert, RAND

  – Presenters: P. Denholm, and W. Short, NREL;
  – W. Krewitt, DLR

2009 Agenda

- Day 2 :
- 9 am- 9:15 Recap of Day one and feedback/questions.

  D. Arent, J. Weyant

- 9:15- 10:00 Ray Schmidt; Woodshole Oceanographic Institute; Assessing Ocean Thermal Energy Conversion

- 10:00- 11:30 am Status of RE Scenario/Capacity Expansion/Integration Modeling

  Session/Discussion Leader: W. Short

  Participants: Wolfram Krewitt, (DLR), C. Namovicz, (EIA), Dan Loughlin (EPA), Qimin Chai, (Stanford)

- Break
- 11:45- 12:45 Case Study Results: How much can the representation of RE technologies be improved in IAMs?

  Present results from initial work performed by NREL and PNNL for Minicam.

  Session/Discussion Leader: G. Pugh, USDOE

  Presenters: L. Clark, PNNL; W. Short

- Lunch

Agenda

Have we identified the key issues?

Who should be engaged to ensure excellence in each country/region?

What approach should be pursued to support a global community of practice and integration with IAM community?

How best to proceed to secure participation and necessary support?

Structure? Operations? Communications?

A few takeaways from yesterday...

- Technology potential presents no meaningful limit on RE contributions, but…it's a competitive world…
- Time and place matter, including climate feedback
- "It's the system stupid"
  - Spatial and technology interactions
  - Details can matter. E.g., Time, Space, Reliability, Carbon price, Flexibility…
- In stabilization, business models will be fundamentally different than today
- Handoffs between tech detail and aggregated/IAMs is a fundamental change in the way we operate (a good one?!!)