

Assisting the World's Transition to a Sustainable Energy Future

Anne Gillette
Lawrence Staudt



Assisting the World's Transition to a Sustainable Energy Future

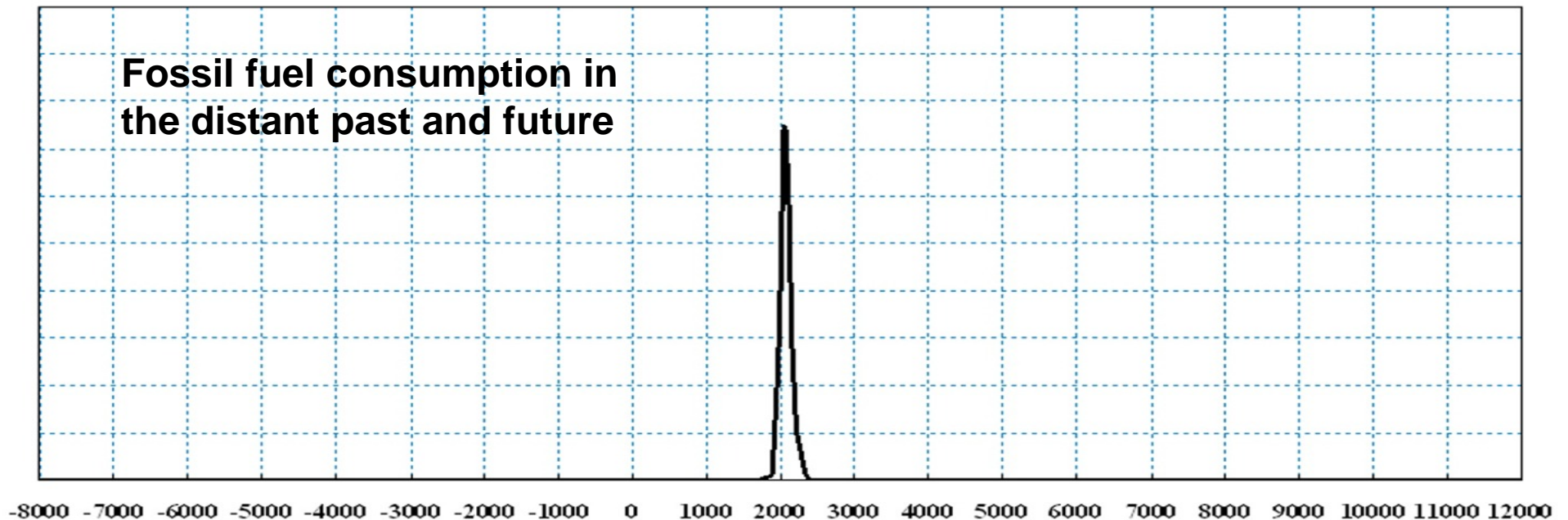


- **Background**
- Energy Sustainability
- Vision
- Assisting the World's Transition
- Case Study
- Conclusions

Background



- Energy resources have been central to the recent rapid development of human society
- Fossil fuel resources are finite
- What will we do next?

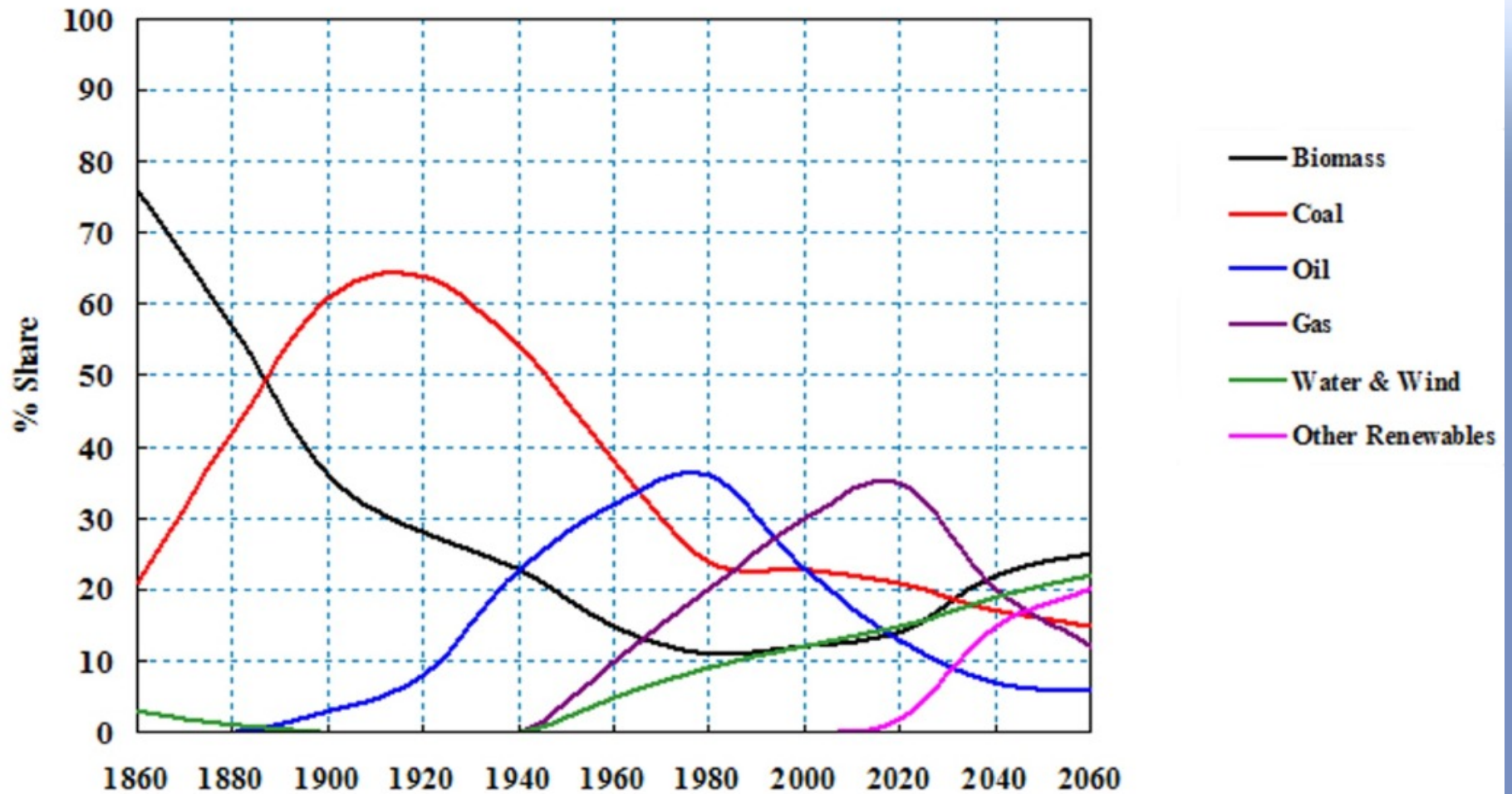


Background



- As recently as two centuries ago, all of our energy came from renewable sources
- We then moved to coal, then oil, and then natural gas
- We now have a mixture of all of these, with renewables increasing and fossil fuels declining

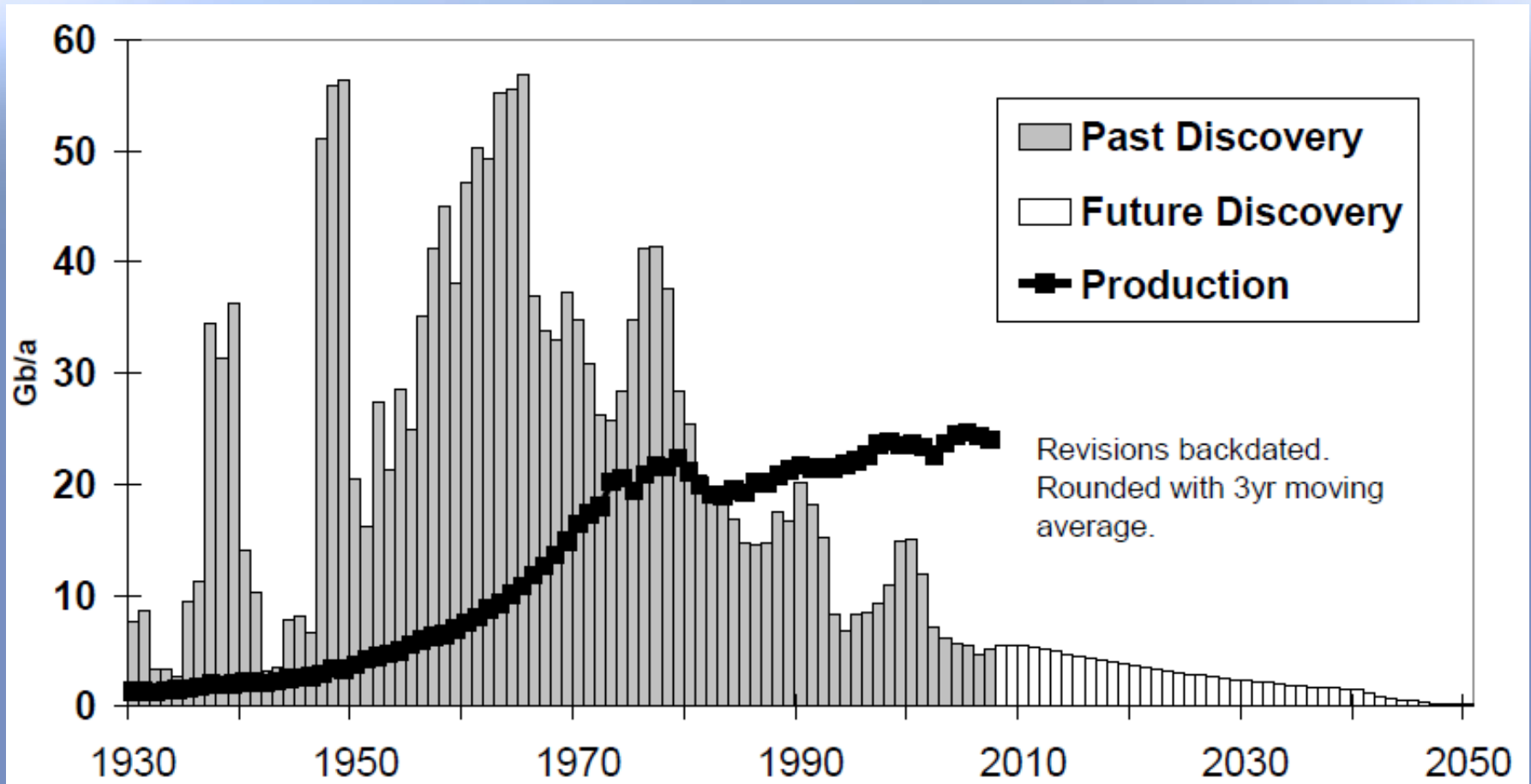
Background



Background



Oil production and discovery, ASPO, 2008



Background



- The situation is quite serious
- “The trouble is that no realistic technological, economic and political strategies for the warding off of the impacts of a decline in conventional oil supply are in sight.”

Society of Danish Engineers and the Danish Board of Technology (2004)



Assisting the World's Transition to a Sustainable Energy Future

- Background
- **Energy Sustainability**
- Vision
- Assisting the World's Transition
- Case Study
- Conclusions

Energy Sustainability



- Sustainability: “Meeting the needs of the present without compromising the ability of future generations to meet their needs”

Our Common Future, p.8, 1987

- Awareness of the need for sustainability is increasing – the first step leading toward implementation
- Propose: energy sustainability means using renewable energy resources

Energy Sustainability



- The society of the future will make use of “all the available sources of energy on the surface of the planet”

Shoghi Effendi, *World Order of Bahá'u'lláh*, p.204

- The implications of this short phrase are:
 1. There will be no energy panacea
 2. Renewable energy, in its various forms, will provide our energy needs



Assisting the World's Transition to a Sustainable Energy Future

- Background
- Energy Sustainability
- **Vision**
- Assisting the World's Transition
- Case Study
- Conclusions

A Vision of Our Energy Future



- Renewable energy is “all the available sources of energy on the surface of the planet”
 - The sun’s rays provide direct heating and energy for photosynthesis
 - The resulting temperature differences result in wind, which in turn results in waves
 - The tides originate from the moon’s gravitational pull
 - Geothermal energy comes from the earth’s crust
- All are “on the surface of the planet”, and can be used to create useful energy

A Vision of Our Energy Future



- Per capita energy “needs” can and will be dramatically reduced, in a more moderate, less materialistic society
- Nuclear energy will play a valuable role (along with fossil fuels) as a transition fuel on the way to a sustainable energy future
 - The only commercial nuclear technology (fission) provides about six percent of the world’s energy
 - “all 436 world-wide operating nuclear power plants can be supplied for several decades” with present uranium reserves (www.euronuclear.org)

A Vision of Our Energy Future



- Positive features of renewable energy include:
 - Little or no pollution or greenhouse gases (i.e. environmental sustainability)
 - Available now and forever (i.e. supply sustainability)
 - Price stability
 - Available world wide (supply security)
 - Potential for development of indigenous energy industry, with associated jobs

A Vision of Our Energy Future



- Challenges for renewable energy include:
 - Cost is higher than fossil fuels
 - It comes in relatively low concentrations
 - Large capital investment required
 - New infrastructure required
 - Limited time to make the transition
 - Insufficient global energy governance to effectively manage the transition
- We must overcome these challenges

A Vision of Our Energy Future



- Very few in the late 1800s could have predicted the massive change in the energy economy, primarily one moving from coal to oil
- The technology for the change was essentially available at that time, but it was only subsequently used on a large scale
- Another interesting energy transition is going to occur in this century, using technology developed in the late 1900s
- Once again it will be a massive, society-changing transition

A Vision of Our Energy Future



- The transition is beginning already
- For example, in 2008 more wind power generating capacity was installed in Europe than any other type of generating plant (e.g. gas, coal, nuclear, etc.)
- Ireland has a national goal of producing 40% of national electricity needs from renewables by 2020, and is presently at 12% and on track to reach that goal, at no “extra” cost
- We conclude that a sustainable energy future is **desirable, possible and inevitable**



Assisting the World's Transition to a Sustainable Energy Future



- Background
- Energy Sustainability
- Vision
- **Assisting the World's Transition**
- Case Study
- Conclusions

Assisting the World's Transition



Bahá'u'lláh tells us:

- “Be anxiously concerned with the needs of the age ye live in, and center your deliberations on its exigencies and requirements”

Gleanings from the Writings of Bahá'u'lláh, p. 213

- How can you and I assist the world's transition to a sustainable energy future?
- If you work in the energy industry already, there should be opportunities!

Assisting the World's Transition



- However, everyone can assist by:
 - Implementing domestic energy conservation and renewable energy systems, even when not “economic” (e.g. subscribe to a “green” electricity tariff even though it is slightly more expensive)
 - Supporting government sustainable energy initiatives
 - Teaching about sustainable energy in children’s classes
- All Bahá’í activities contribute in the long run toward a sustainable energy future for the planet, in that they encourage (both individually and collectively) a spiritually-focused, moderate lifestyle

Assisting the World's Transition



- Within the energy industry, Bahá'ís are:
 - Helping develop world energy policy
 - Helping develop an ethical green energy industry
 - Working to develop community-based sustainable energy projects
 - Conducting academic research and educating a new generation of energy engineers and scientists
 - Helping facilitate the development of utility-scale renewable energy
 - etc.

Assisting the World's Transition



- Our efforts are guided by a much bigger framework and vision than most of our friends working in this field
- We can see how sustainable energy practice is one of the many puzzle pieces needed to facilitate an “ever-advancing civilisation”
- The phrase “Think globally – Act locally” is particularly applicable to the Bahá’í community

Assisting the World's Transition to a Sustainable Energy Future



- Background
- Energy Sustainability
- Vision
- Assisting the World's Transition
- **Case Study**
- Conclusions

Case Study: RETI



- California's Renewable Energy Transmission Initiative (RETI)
 - ➔ one example of a state's attempt to build consensus as a means of speeding the transmission to a (more) sustainable energy future

RETI: California's Policy Context



- Global Warming Solutions Act of 2006 (AB 32)
 - State-wide mandate: 1990 GHG levels by 2020
 - Goal: 80% below 1990 levels by 2050
- 33% by 2020 Renewables Portfolio Standard (RPS) is a key strategy for achieving AB 32 goals
- 20% by 2010 RPS already law, but will not be achieved; California at ~13% RPS-eligible energy
- Need major progress – new ideas! – if 33% is to be achieved

Why Transmission?



- Renewable resource quality (cost) varies greatly by location. *The best resources are where they are.*
- New transmission lines are thus absolutely critical to achieving 33% with utility-scale (i.e. today's most cost-effective) renewables.
- Transmission lines are ugly and unpopular; permit applications litigated, permits appealed

Trade-offs



- Renewable energy not without negative environmental impacts
 - Utility-scale renewable generation holds most near-term promise for addressing energy needs but have large land use and transmission requirements
 - Environmental groups: want to address climate change, but concerned about habitat, watershed destruction.
 - Native American tribes: interested in economic development, but concerned about cultural resource destruction, inappropriate use of significant lands



Trade-offs



- Californians support the idea of transitioning to a sustainable energy future – perhaps more than any other U.S. populace
- Californians also love their Wilderness Areas, their National Forests, their State Parks, and their views.

Are these desires mutually-exclusive?

The Renewable Energy Transmission Initiative



- Initiated by CA state agencies – 2007
- Mission: Identify, expedite planning & permitting of new transmission to access most cost-effective and environmentally-preferable renewable generation in CA and neighboring areas
- Operating principles: All accept goal of developing new transmission for renewables and agree to work in good faith to find best solution
- Recommendations not official or binding, but will inform, influence planning and permitting decisions at utilities, grid planners, agencies.

The Renewable Energy Transmission Initiative



- Participants: anyone
- 30-member Stakeholder Steering Committee that oversees analysis: state and federal agencies; ratepayer advocates; environmental groups; power buyers (utilities); transmission owners; renewable generation developers; grid operator; Native American tribes; local government
- *All must compromise.* Goal is consensus – “an outcome that all can live with.” Nearly all decision have been by consensus.

The Renewable Energy Transmission Initiative



“O Son of Man! If thine eyes be turned towards mercy, forsake the things that profit thee, and cleave unto that which will profit mankind. And if thine eyes be turned towards justice, choose thou for thy neighbor that which thou choosest for thyself.”

RETI = concrete attempt to put these words into action

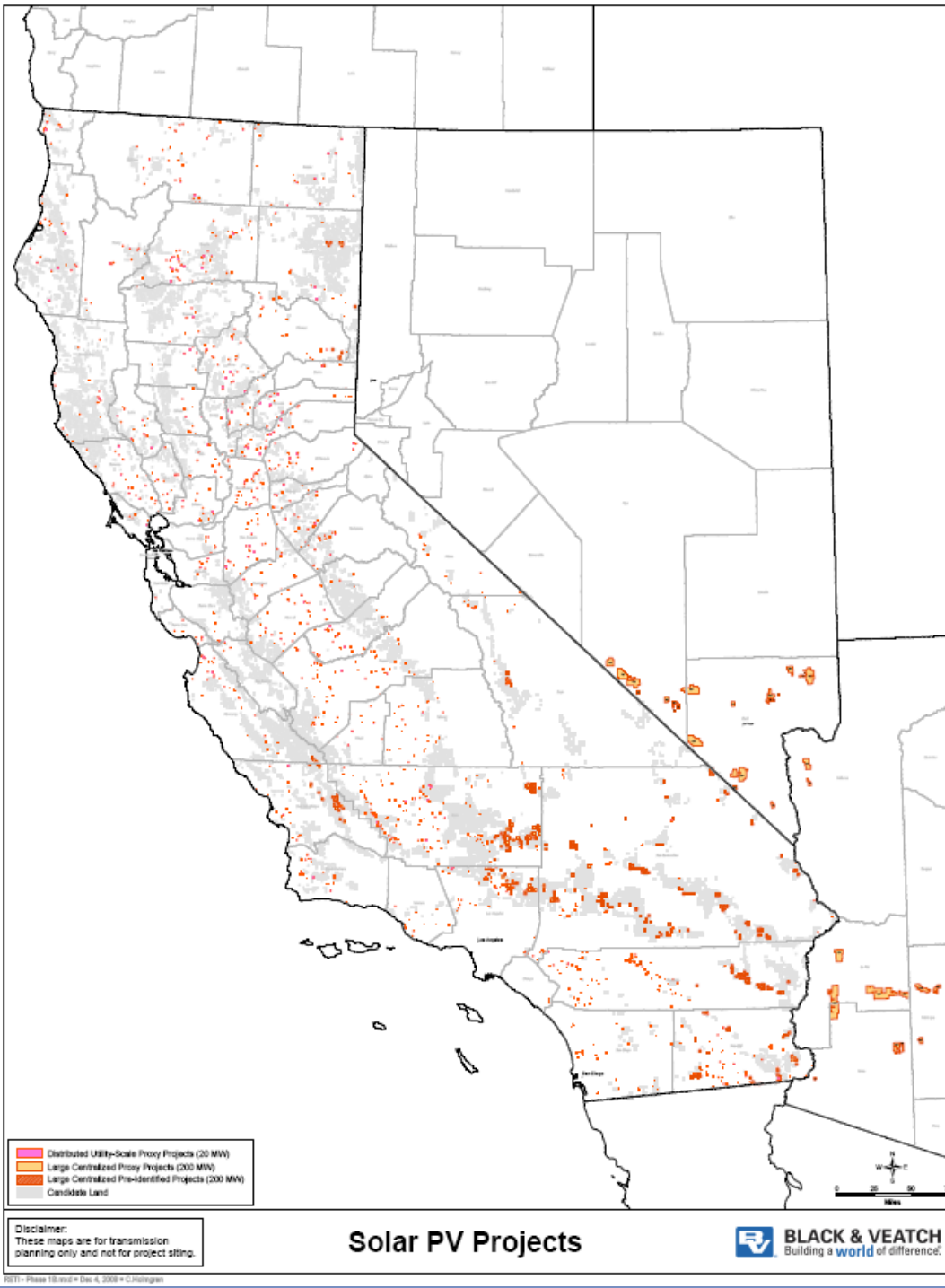
Progress



- **Phase 1** – Identify Competitive Renewable Energy Zones (CREZ) – areas having high densities of cost-competitive, developable resources – and rank them according to economics and environmental concerns (*complete December 2008*)
- **Phase 2** – Refine analysis for priority CREZ and develop statewide conceptual transmission plan (*2A complete August 14 2009 ?*)
- **Phase 3** – Complete detailed transmission plans for priority CREZ (*2009-2010*)

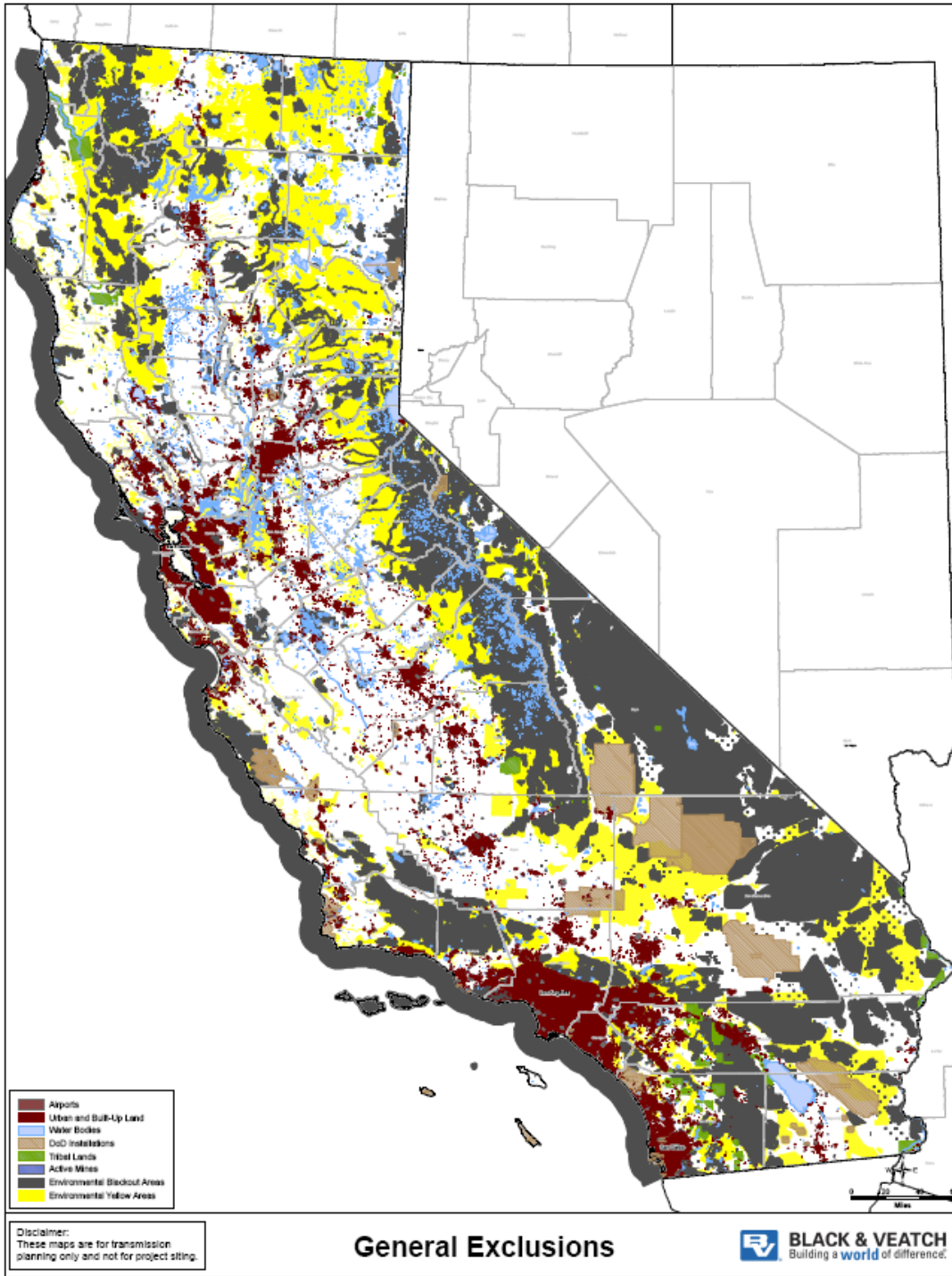


- Solar, wind, geothermal, biomass, and small hydro resources were assessed in CA and neighboring states



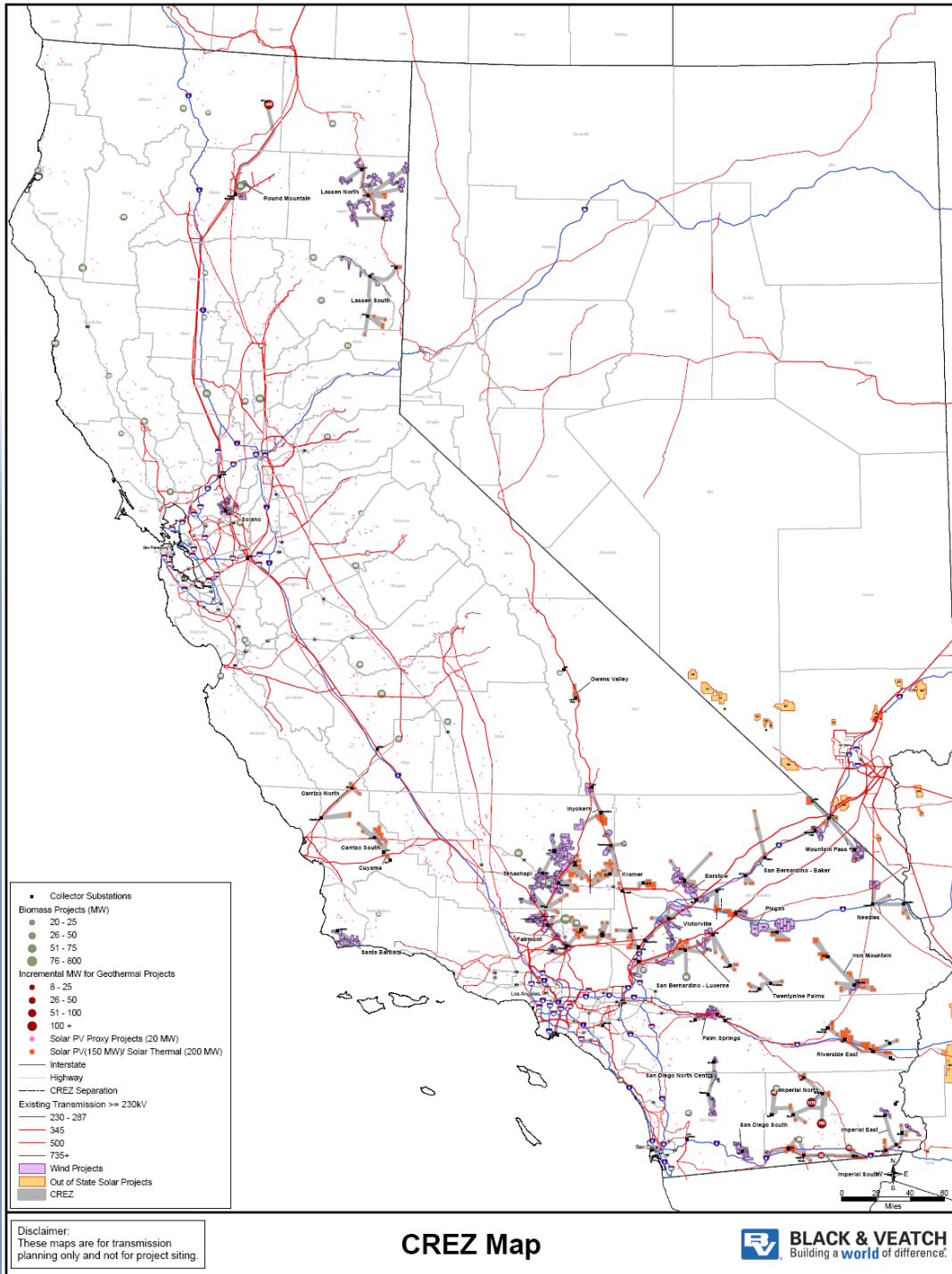


- Areas were determined by consensus to be off limits to renewable generation, for purposes of RETI's renewable resource assessment





- CREZ were identified and ranked





- A statewide conceptual transmission plan was developed; individual line segments were scored and ranked

Challenges



- Concern about environmental impacts of solar development in desert – portrayed as “clash” of environmentalists in the desert
- Entrenched ideas about “sides” at times difficult to overcome
- Not all debates/discussions were resolved satisfactorily

Future



- Will group stay cordial as RETI begins to make real recommendations to state agencies, with billions of dollars of investment at stake?
- RETI not “picking winners and losers” among those wishing to develop new generation or transmission in California...
- ...But it has become a very high-profile and influential initiative, and all would like its blessing.

How might Baha'is contribute to / view processes like RETI?



- Formation itself in line with exhortations to focus on “*that which will profit mankind,*” and to “*be anxiously concerned with the needs of the age ye live in, and center your deliberations on its exigencies and requirements*”.
- Within RETI and processes like it, Baha'is can strive to bring certain principles into play, thereby increasing the effectiveness of the processes:
 - Elimination of all forms of prejudice; independent investigation of the truth
 - Consultation
 - Justice



Assisting the World's Transition to a Sustainable Energy Future

- Background
- Energy Sustainability
- Vision
- Assisting the World's Transition
- Case Study
- **Conclusions**

Conclusions



- Our primary function as human beings on this beautiful planet is spiritual development
- We need to work to optimise the conditions of society for this function, and advance civilisation sustainably such that future generations can also effectively make their pilgrimage through this life

Conclusions



- One important part of this future society will be a sustainable energy system, which it seems will be based on renewable energy
- We are at the beginning of a major transition from fossil fuels to renewable energy – a transition that will take place at an increasing pace, and largely take place during this century
- This transition is desirable, possible, and inevitable, and is an exciting area to which Bahá'ís can contribute

Conclusions



- With this vision we can all play our part as responsible consumers of energy
- Those of us in the energy industry can play our part by facilitating the responsible transition from the present fossil fuel energy system to one based on renewable energy

Thank you!

Anne Gillette (AEGillette@yahoo.com)
Lawrence Staudt (LDStaudt@gmail.com)

