Title: INDRA project : Hypothesis Test : Regional energy efficiencies through managed rainfall

Proposer:

Gare Henderson
Director of research & development
[gare.henderson@gravitationalsystems.org]
Gravitational Systems Engineering, INDRA project
Box 192, Fairfax, Va 22039 202-558-5319
http://www.gravitationalsystems.org/

Proposal Abstract:

The INDRA project is a combined scientific and legislative initiative, conceived to address significant persistent and growing energy challenges. The primary energy target of the INDRA model is the reduction of the base energy loads committed to municipal and agricultural water movement. The second DOE relevant goal is the potential for regional management and amelioration of unpredictable violent weather, and concomitant energy impacts. The central energy hypothesis of INDRA is "Management of, especially arid, regional hydrology's will significantly increase national energy efficiency and regional energy effectiveness. If hydrology management objectives are base energy demand normalization, and increased energy productivity. Regional hydrology can be managed via the strategic and tactical up-drafting of evaporated brackish water."

The ability to balance or enhance regional hydrology will provide a wide range of long term energy efficiencies. Regional hydrology is a significant variable in the determination of prevalent weather conditions, and larger inter-regional weather trends. INDRA proposes to enhance low rain cloud formation with regional humidity appliances and administration. Enhanced low cloud formation through increased levels of atmospheric humidity at lower elevations when combined with particulates from hydrocarbon combustion, fine sand particles, or especially large sea salt nuclei are historically significant conditions for generating rainfall.

In brief INDRA proposes a network of wide shallow evaporation channels, fed from brackish sources such as inland seas, bays, and salt marshes. Evaporation channels use a combination of natural wind redirection, and green energy activated updraft appliances, to direct evaporated water to higher elevations. The modest primary energy requirements of INDRA, water movement, misting, and up-drafting are dwarfed by the regional energy efficiencies, in agriculture, industry, and municipalities.

Regional energy reductions will come from reductions in artificial irrigation, municipal potable water pumping, municipal waste-water pumping, and air conditioning. Additional benefits will come from increased land productivity, localized salt production, reservoir management, disaster preparedness, and many benefits beyond our purview.

The initial challenges are in proof of concept, hypothesis testing, modeling, and method optimization. A variety of data collection studies will need to funded and managed. The majority of this work can be accomplished with university and private research grant funding. Literature reviews, modeling, and hypothesis testing can also be accomplished with similar funded research. These research endeavors will require DOE support for a period we estimate to be from 10-25 years.

Our approach is to develop consensus among various experts about strategic and tactical goals, methodologies, and means to generate a series of testable hypothesizes. This consensus can be gained initially through questionnaires, and formalized through committee reports. Modelers will then be employed to validate the generated hypothesizes. Statistical analysis of historical data will be used to screen the most promising hypothesis, prior to actual field testing.

Field testing can initially be performed as adjunct to road construction, conservation, and water management projects. Valuable data can also be obtained by relatively small land use, and facilities designs near compatible sources. Coastal military facilities could readily be modified to optimize brackish water evaporation, and to evaluate various up-drafting schemes.

INDRA project goals are well aligned with several existing DOE missions.

Critical infrastructure protection: Storm condition mitigation, storm control, weather control
Watershed management: Source management. drought mitigation
Energy efficiency: Desalination energy efficiency. agricultural energy reductions, air-conditioning usage reductions
Energy security: Conversion of unproductive areas to energy production, heat wave peak energy management