

CAP Holdings Company Introduction



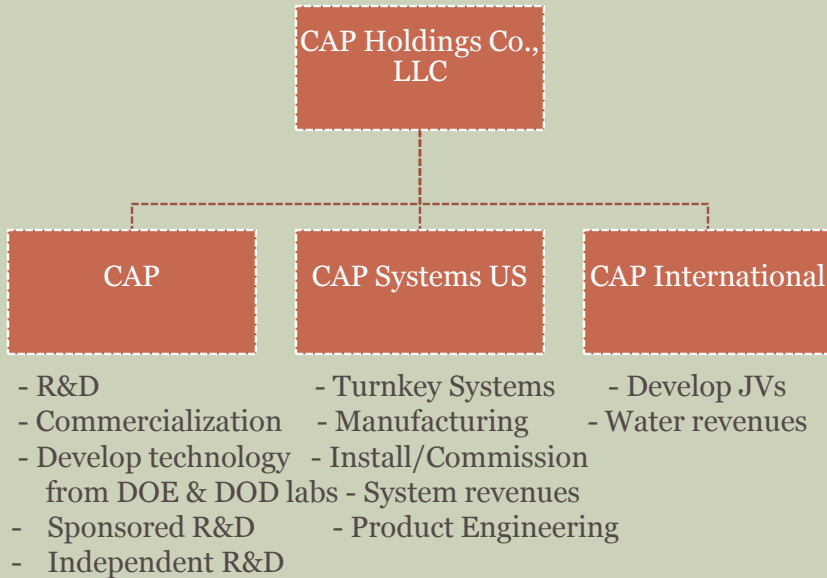
PRESENTATION TO

MARINA COAST WATER DISTRICT
BOARD OF DIRECTORS

AUGUST 19, 2013

CAP Holdings Company (CHC) Organization

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- CAP Holdings Co. consists of the three entities shown on the left

- Functions of CHC:

- Project Finance
- Strategic Planning
- Operating Budget
- IP Management
- New Market Development
- IT Systems

- Monterey Bay Operation (MBO) is a set of projects within CAP to be accomplished at various sites in the Monterey Bay region with several local strategic partners.

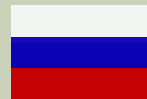
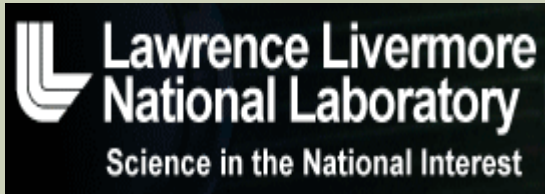
CHC Mission & History



- **Goal: Develop next generation water treatment systems**
 - Capable of autonomous operation
 - Modular and scalable
 - Minimal energy consumption using renewable sources
 - No consumable chemicals
- **Goal achieved with Advanced Seawater Reverse Osmosis system**
 - Drinking water production uses 20 - 40 % less energy than comparable systems
 - Reliable - benign impact on local marine environment
- **2011 R&D100 Magazine Award**

CHC & Oak Ridge National Lab developed special desalination electrodes which facilitate treatment of large quantities of water more effectively than conventional technologies
- **2010 & 2011 US Industry Coalition Award**
 - Selected as US Industry Coalition member success story
 - Over 100 US companies, including Boeing, GE, DuPont, Ford and GM belong to USIC

Technology Partners



National Science Center
Kharkov Institute of Physics and
Technology



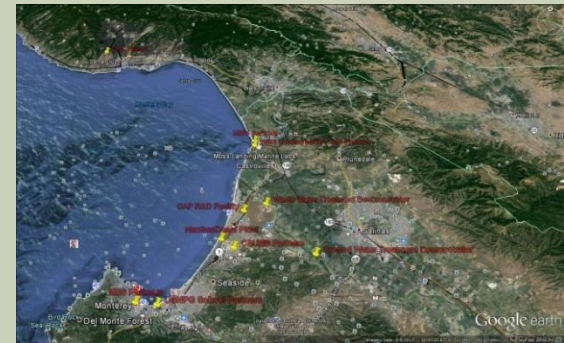
Institute of Physics Georgia
Technical Institute

Cooperative Research and Development Agreements (CRADAs) with these labs positions CHC at forefront of R&D and commercialization of new water treatment, renewable energy, and energy storage technologies

CAP Monterey Bay Operations (MBO) Project

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- Principle site for CAP's Technology Sponsorship Programs
- Physical facilities in close geographical proximity on Monterey Bay, California
 - CAP R&D facility for water technologies and renewable energy generation and storage
 - Seawater desalination demonstration plant (revenue producing) operating 24/7 on seawater
 - Waste water treatment for agriculture demonstrator (huge local agricultural water demand with degrading ground waters)
 - Contaminated ground water treatment demonstrator (significant military base reuse problem)
- Provide Elevated Awareness of CHC to Local Communities with Growing Water Shortages
- Local University Internships
- Local Marine Science Expertise
- Proximity to Silicon Valley
- Attractive Destination for Scientists and International Clients
- Excellent Local, State and Federal Government ties



Candidate Local Partners

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New Water Technologies at MBO



- Technologies to be developed at CAP MBO
 - NexGenDesal seawater desalination demonstration plant
 - Plasma Water Treatment (CHC IR&D with DoE technology)
 - Capacitive Deionization (DOE ORNL and KIPT)
 - CFD for CBMPW and Brackish Waters
 - Oxidation with Hydraulic Cavitation for Grey Waters
 - Ejector Vapor Compression for high TDS Waters
 - Global Secure SCADA for all demonstrators
 - Sea floor mapping using GRACE satellites for intake systems

New Power Technologies at MBO



- Renewable energy for water treatment systems
 - Plasma Arc Furnace (DOE GIPP CRADA)
 - Uses municipal waste as fuel for water treatment systems
 - Clean burning, extremely efficient
 - High Pressure Electrolyzer (DOE GIPP CRADA)
 - Stores wind, solar, and sea kinetic generated energy as hydrogen
 - Generates electric power from stored hydrogen
 - Electric Whale (CHC IR&D with Boeing)
 - Converts ocean gayer flow into electric power
 - Hydrogen generation
 - Rare Earth Metal Extraction
- Solar/Thermal power for NexGenDesal (CHC, DOE, Cogenra)
 - Photovoltaic with heat collection

Advantages of Monterey Bay Operation Presence



- Local access to innovative cutting edge water treatment technologies
- Presence in community of leading US and international water treatment specialists
- Cooperation in finding solutions to local water related problems
 - Energy efficient, environmentally benign desalination
 - Contaminated soil cleanup
 - Waste water recycling
 - Agricultural runoff decontamination
- Local Internships
- DoE Scientist Sabbaticals