
The Adaptive Brigade

Building a Highly Sustainable Ground Force

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The future . . .

- Dynamic, unpredictable situations
- Varying levels of violence
- Stability and assistance aspects
- Diverse actors
- Asymmetric threats
- Adaptive enemies
- Distributed operations
- Extended supply lines



The need . . .

Build a ground force capable of deploying worldwide, using an integrated full-spectrum suite of effects to execute a range of missions as required to support national security objectives.

Ground force power and energy needs are exploding!

Combat power enhancements:

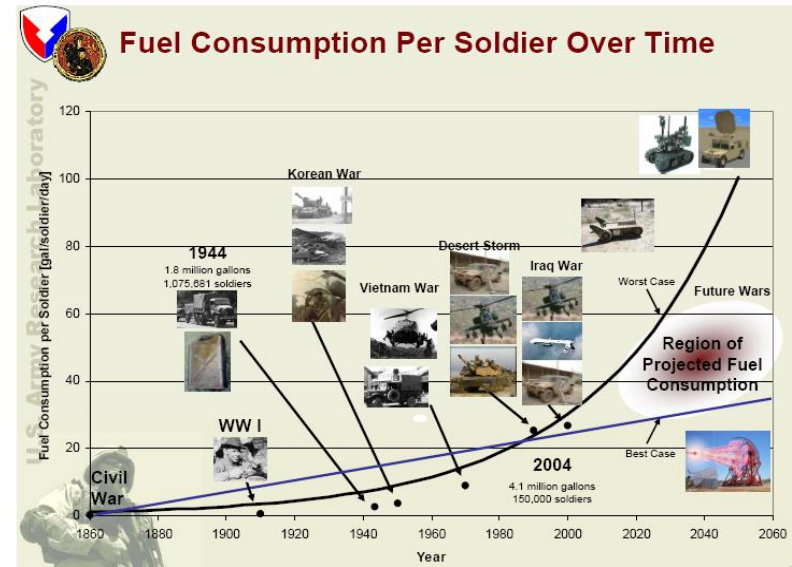
- Sensors, computers, communications
- Platform speed, mobility, survivability
- Automation, unmanned vehicles

Broadening spectrum of operations

- Consequence management
- Stability operations
- Combating terrorism

Evolving execution environment:

- Quality of life/readiness
- Contractors on the battlefield



Reliance on external resupply brings costs/risks

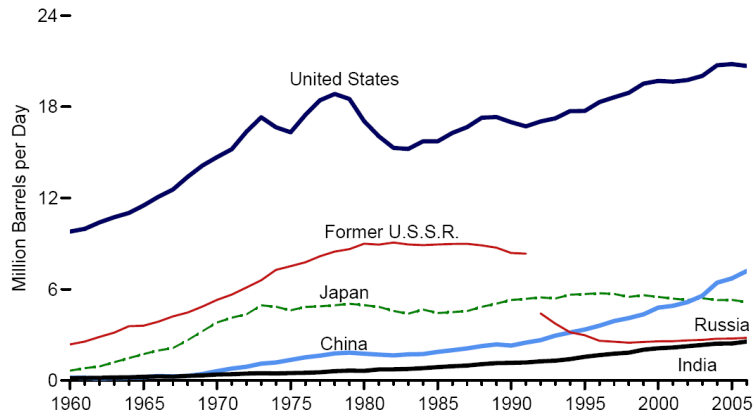
- **Resupply cost**, manpower, infrastructure requirements
- **Diversion of combat assets** to escort convoys
- **Vulnerability to disruptions**, could impact mission, force protection
- **Dilution of mission focus** to secure lines of communication
- **Military options limited** by need to maintain “right-of-way”



... and the competition for petroleum fuel heats up

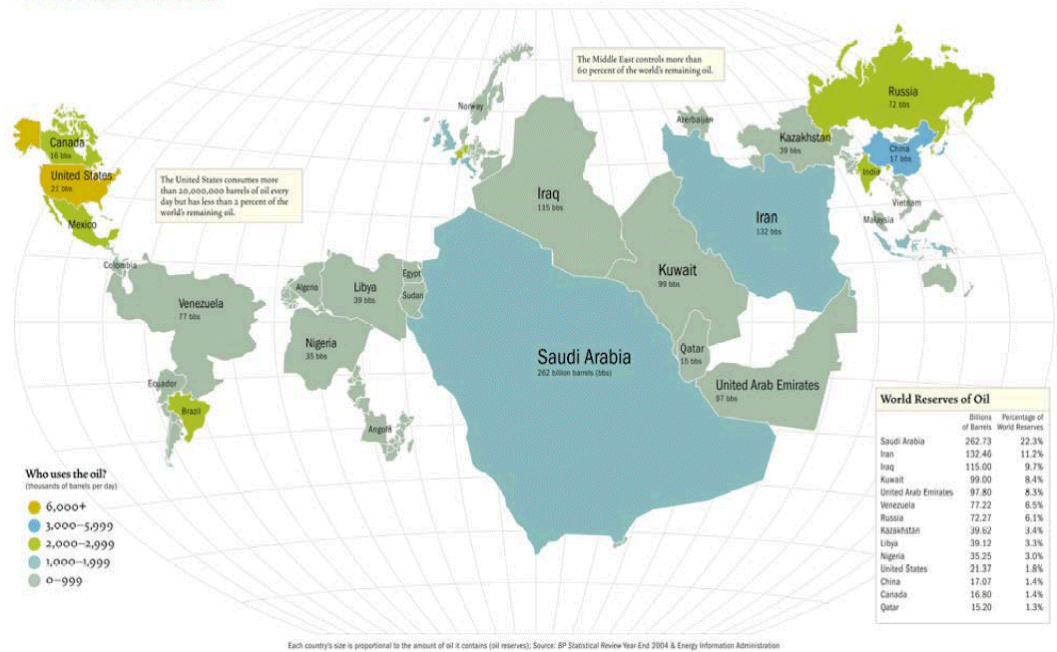
Who wants the oil?

Top Consuming Countries, 1960-2006



Source: http://www.eia.doe.gov/emeu/aer/pdf/pages/sec11_20.pdf

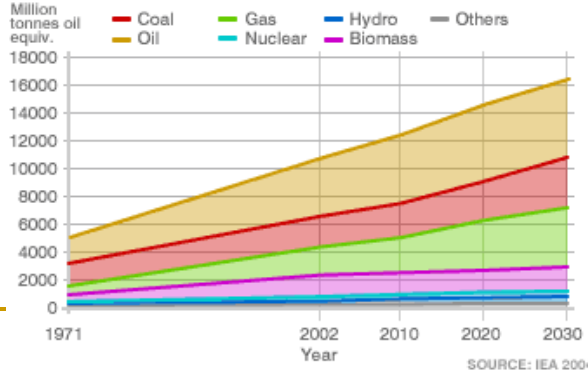
Who has the oil?



Country	Billions of Barrels	Percentage of World Reserves
Saudi Arabia	262.73	22.3%
Iran	132.46	11.2%
Iraq	115.00	9.7%
Kuwait	99.00	8.4%
United Arab Emirates	97.80	8.3%
Venezuela	77.22	6.5%
Russia	72.27	6.1%
Kazakhstan	39.62	3.4%
Libya	39.12	3.3%
Nigeria	35.25	3.0%
United States	21.37	1.8%
China	17.07	1.4%
Canada	16.80	1.4%
Qatar	15.20	1.3%

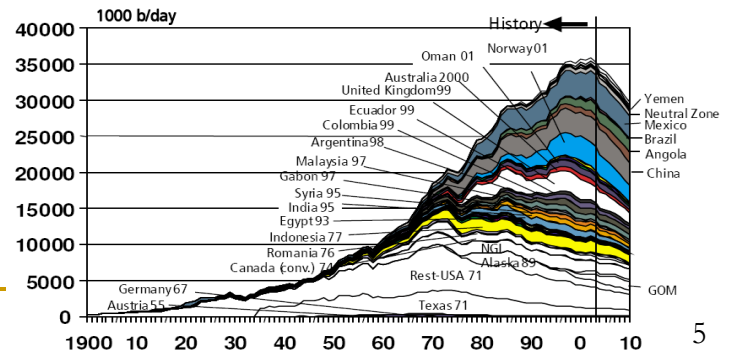
Each country's size is proportional to the amount of oil it contains (oil reserves). Source: BP Statistical Review Year-End 2004 & Energy Information Administration

World primary energy demand



SOURCE: IEA 2004

Oil Production for Non-OPEC & Non-CIS States (US Department of Energy, 2006)

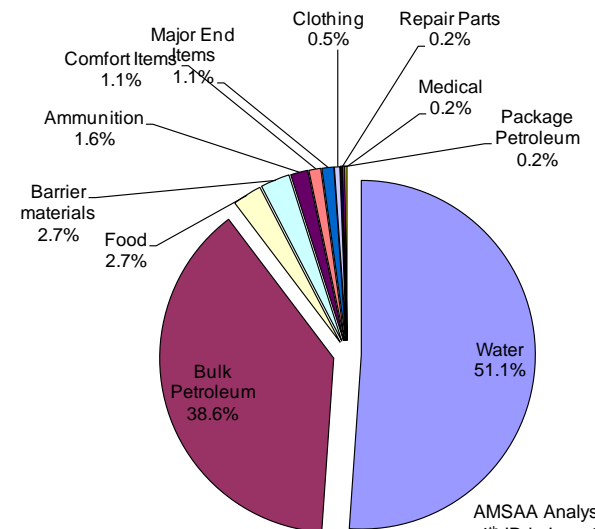


Source: Industry database, 2003 (IHS 2003) OGI, 9 Feb 2004 (Jan-Nov 2003)

How prominent are energy, power and water?

- Fully-burdened cost of fuel in Iraq typically \$5-30; as high as \$400 reported in Afghanistan
- Security for supply convoys in Iraq required an average of 1 combat battalion on a continuing basis (2009 estimate)
- Ground resupply has accounted for over 2000 soldier deaths, or approximately half of US casualties in Iraq
- Winter resupply in Afghanistan can take up to 45 days from source of supply to the end user.
- Fuel and water comprise 70-80% of ground resupply volume, after initial combat
- Per soldier demand in Iraq 16 gal fuel/day
- Water demand variable, but at least 3 gal (23 x ½ liter bottles)/day/soldier
- >50% of fuel is used to produce electricity
- Fueled generators typically <40% efficient
- Base camp power systems' overall efficiency closer to 10%

Representative battlefield logistics volume



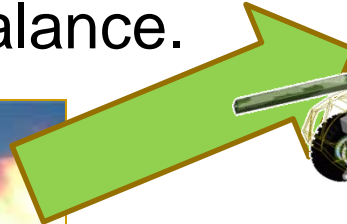
New Army Capstone Concept

“... an Army that is a versatile mix of tailorable and networked organizations, operating on a rotational cycle to provide a sustained flow of trained and ready forces for Full Spectrum Operations and to hedge against unexpected contingencies - at a tempo that is predictable and sustainable for our all-volunteer force.”

- **The Army must hone its ability to gain, sustain, and exploit physical control and psychological influence over people, land, and resources**
- **Revise assumptions** based on lessons of ongoing conflicts in order to **make grounded projections** of future armed conflict
- Monitor the signposts...**do what needs doing now and be alert for evidence our assumptions are becoming vulnerable or changing**
- **Acknowledge uncertainty**...technology is not a panacea to the fog of war but an enabler to meet its challenges
- Deal with uncertainty through a **mindset** based on flexibility of thought and **operational adaptability**
- Train, man, and equip to **operate decentralized** at the lowest levels on **less than perfect information** for close combat in any terrain
- **Synchronize modernization with ARFORGEN**
 - Modernize in increments...fielding priorities based on ARFORGEN cycles
 - Accelerate capability development (e.g., Counter Rockets, Artillery & Mortars)
 - Shorten the requirements cycle...two years...revise concepts more frequently...buy less, more often

New concepts demand an adaptive force

The ***Adaptive Brigade*** would embody flexible full-spectrum force capabilities to meet emerging demands of agility, distribution, speed, resiliency and balance.



Design principles:

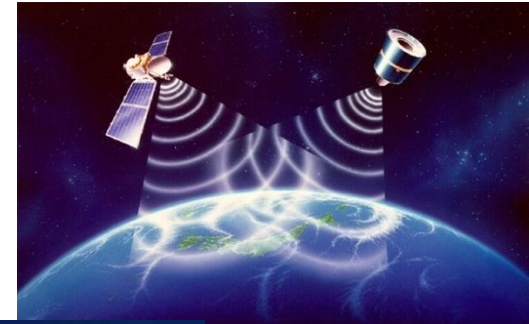
- Effective full-spectrum tools
- Adaptive soldiers and networks
- Flexible systems/technologies
- “Flat” organization/architecture
- Resilient support schemes

Adaptive Brigade Design Approach

- ❑ Provide capabilities to conduct **flexible, full-spectrum** operations on a sustained basis in an **expeditionary environment**;
 - ❑ **Interoperable** hardware, software, battle command and soldier expertise to fully support **joint, interagency, coalition** approach;
 - ❑ Flat organization, modular structure to support **decentralized or massed** operations;
 - ❑ Maximize **external support** to focus soldiers and limit logistics burden in Brigade area;
 - ❑ **Organic capabilities** enable ongoing operations without continuous external support;
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- ❑ **Energy, power and water** (PEW) are key components; **integrate into planning** and behaviors
 - ❑ **No single solution** – combination of management, efficiencies, technology alternatives and informed CONOPS
 - ❑ **Coordinate** strategies for **sustainment and effects**
 - ❑ Find **alternative sustainment approaches**, including renewable energy, local resources and infrastructure

Reduce boots on the ground

- Adaptable soldiers
- Persistent, responsive surveillance
- Expanded reachback
- Unmanned systems
- Responsive logistics alternatives



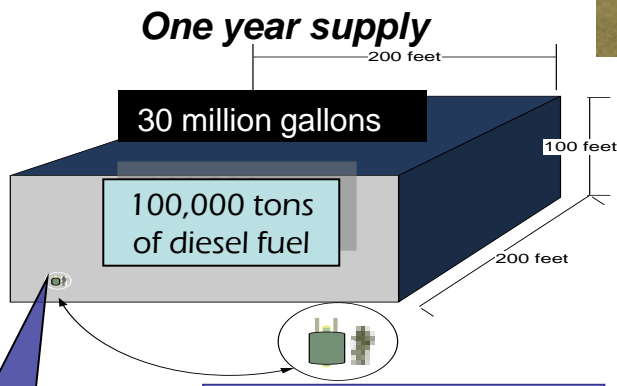
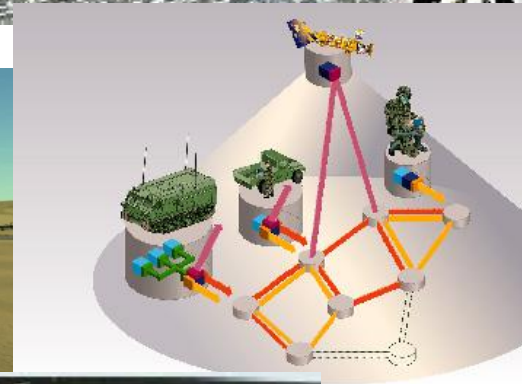
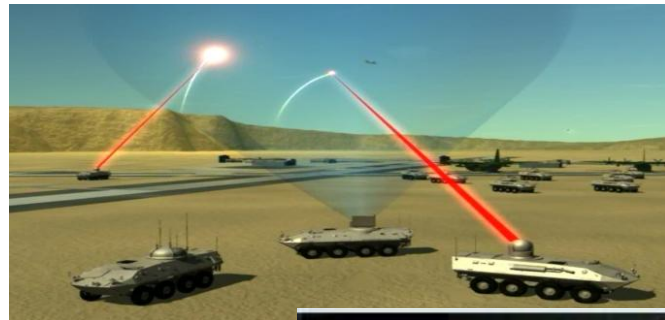
Make the most of what you have

- Flexible management/control systems
- Multifunction platforms/equipment
- Interoperable systems, parts
- Recycle/reutilize
- Utilize local resources



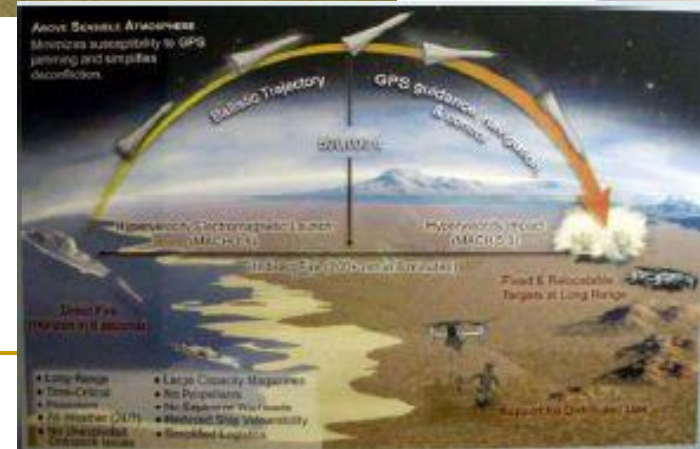
Disruptive technology advances

- Wireless energy transfer
- Scalable effects
- Long-range precision fires
- New liquid fuel
- Nuclear energy

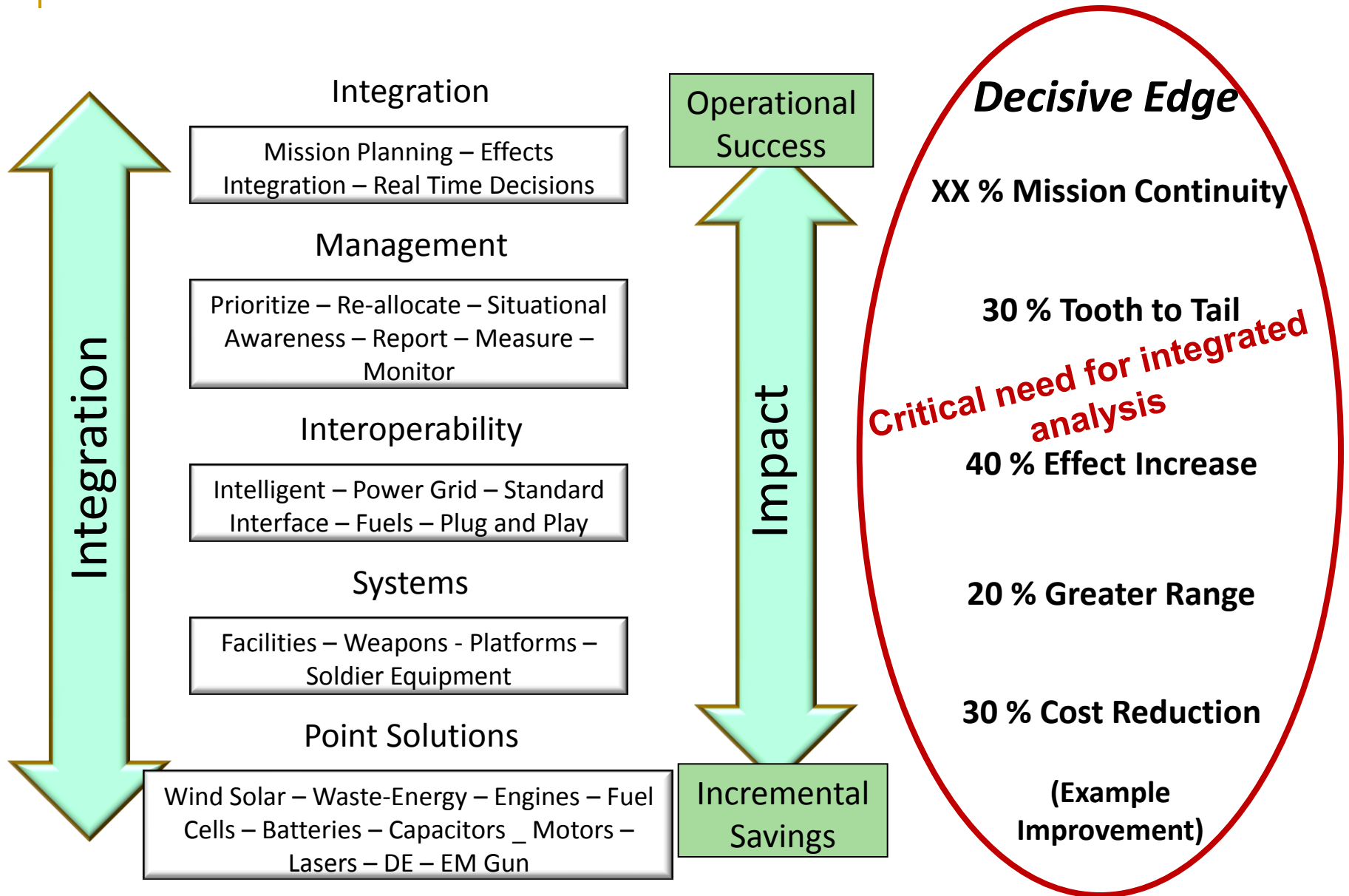


50 Megawatt Reactor

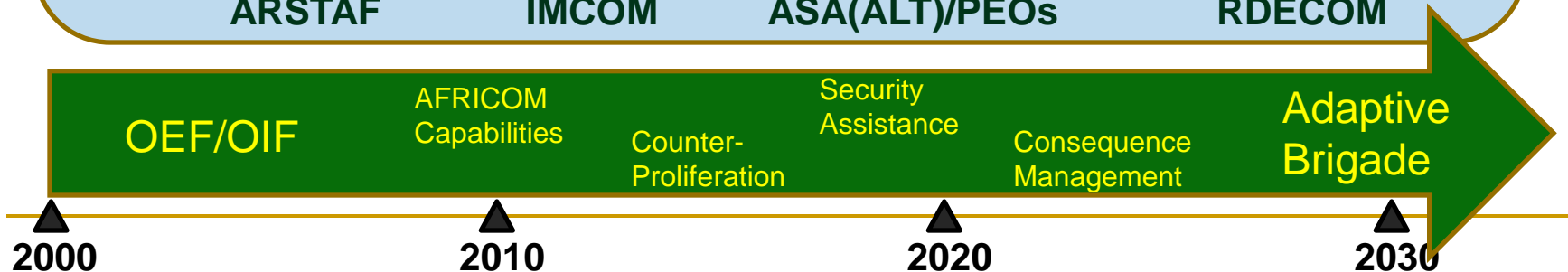
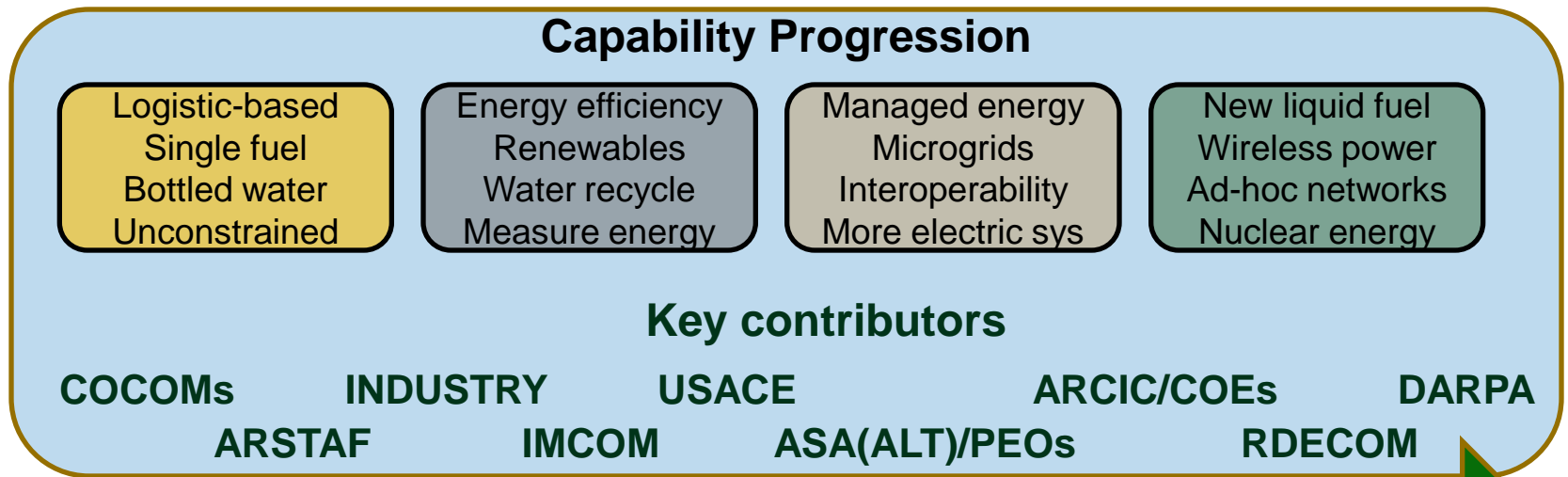
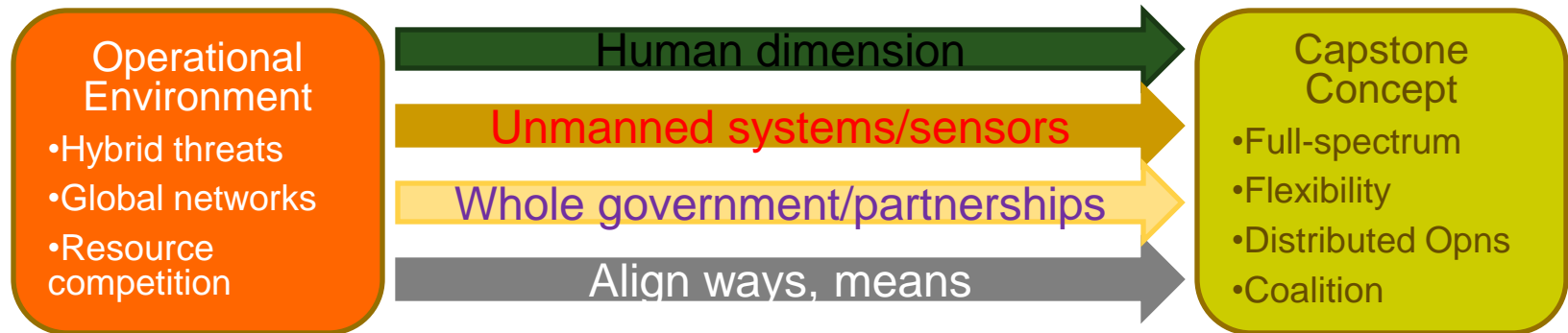
600,000 gallons per week



Integration Leverages Performance Improvement



Operational Energy Modernization



Prospective benefits

- **Reduce fully burdened resupply cost** – up to 70% reduction in long-haul resupply volume reduces manpower and infrastructure dedicated to secure lines of communication.
- **Increase availability of combat assets** - fewer trips/combat losses; increased “tooth-to-tail” ratio translates to greater combat power on the ground (a battalion equivalent in Iraq today).
- **Reduce vulnerability to disruptions** – increase “basic load” capability from days to weeks.
- **Enable increased mission focus** – center of mass for operational activities shifts back to the military mission (combat, stability operations, counterproliferation, etc.)
- **Provide more military options** - Enable deployment and operation in otherwise untenable area; facilitate resupply via vertical lift.
- **Enhance stability operations** - Reduce burden on local resources; increase ability to support basic services and reconstruction.

Questions?

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