

2007-2017 KEY DRIVING FORCES

PEOPLE REGIONS BUILT ENVIRONMENTS NATURE MARKETS BUSINESS ENERGY

AN IMPERATIVE FOR LOOKING LONG
The 21st century will test our ability to grasp the future impacts of present choices, but even as we struggle to incorporate future knowledge into our day-to-day decisions, we're tuning up our bodies and minds and even our cultural frameworks for a much longer view.

A PLANET AT RISK
As climate change, deterioration of the global food chain, uncertain energy supplies, natural resource vulnerability and environmental health issues loom, ecological indicators will become key measures that organizations—and society as a whole—need in order to steer a strategic course.

MARGINAL POPULATIONS REDEFINE THE MAINSTREAM
Marginalized populations—whether they are slum dwellers, citizens of economically disadvantaged countries or people with disabilities—will grow in number and influence over the next ten years, remaking mainstream culture.

PARTICIPATORY CULTURE DRIVES CHANGE
Taking advantage of lightweight infrastructures—for everything from media to energy to fabrication—many more people will participate in the creation of the cultural fabric that defines who we are and how we will manage the dilemmas that face the world in the coming decade.

NEW COMMONS CREATE NEW VALUE
Even as the Earth's natural commons are increasingly at risk, humans are creating new kinds of commons around shared resources that can generate and sustain new wealth, health and well-being in the face of these risks. From the Internet to bio-commons, these will provide new lessons in human social organization.

A NEW MATERIAL WORLD
The human ability to engineer at the molecular level, whether through biological, chemical or electromechanical means, will grow over the next decade, changing not only the way we manage the world but actually transforming it to create new kinds of built environments—and new ways of living in them.

POPULATION GETS YOUNGER

Increasing life expectancy in developed world and parts of developing world shifts life stage, behaviors and views of future

Citizens of Sustainability Nearly Mainstream
Number of people
Source: Institute for the Future

ECO-HEALTH LITERACY

- More holistic models of health
- New DNA links to the environment discovered
- Global education reframed

VOLATILE FEEDBACK

As climate change debates intensify, extreme positions and actions grow:

- Children become a 'protected population'
- Fundamentalism, on all sides, grows
- Eco-terrorism risk rises

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POWERFUL PERIPHERY

Coping strategies and resilience for an eco-challenged world come from challenged populations: the aged, chronically ill and those with disabilities

PERSONAL SUSTAINABILITY

Practices and tools to tune, tweak and transform "green" behavior:

- Eco-footprint calculators
- Carbon offsets
- Online eco-accounting

Source: www.terrapass.com

Terrapass lets individuals purchase carbon offsets for travel footprints

LITERACY OF THE COMMONS

New ways of building identities and communities allow for better group management and accountability for shared vulnerable resources of all kinds

Source: Capitalism 3.0, Barnes, 2006

The commons as a tool for sustainability

BIOCOMMONS

Open-source biology, biotech and biological design

- Cell therapy
- Somatic gene therapy
- Caloric restriction drugs

ENGINEERED LONGEVITY

Organizations—like BioBricks, a dynamic protected commons of enabling technologies in the life sciences—encourage open improvement and innovation

Source: http://nanorichitecture.net/article?c=synthetic-biology

CITIZENS OF SUSTAINABILITY

Green consumers will become "sustainable citizens," as smart-networking skills, do-it-yourself attitudes and a focus on personal and community health converge.

Expect more self-empowered grassroots activism, especially at the local level

Source: From the Bottom Up, Pregracke, 2007.

THE STATE IS BACK

New assertiveness in standards setting, monitoring, adjudication and enforcement

ENVIRONMENTAL DEFENSE FORCES

- Could armed forces protect the planet?
- Could the U.N. enforce compliance?

DECENTRALIZED AUTHORITIES

Competing tools, interests and voices of authority:

- New scientific discoveries
- Corporate regulators
- Tools for monitoring
- Empowered communities
- New legislation

THE NGO NEXT DOOR

A potent watchdog for community sustainability

PARTICIPATORY GREEN PANOPTICON

Enabled by portable connected media, top-down surveillance and distributed bottom-up 'sousveillance' will redefine privacy and secrecy and drive forms of participatory governance

Source: http://openinthefuture.com

DEEP LOCALISM

Citizens of sustainability will focus efforts on local communities and commerce: local commons for the global good.

CHAMBER OF COMMONS

Cross-boundary governance responsible for identifying and managing local commons

CHEMICAL TRESPASS

As scale of detection and investigation grows smaller, chemical and product scrutiny increases and intensifies

- Cradle-to-cradle manufacturing standards
- Product waste taxes

NO MORE GRAVEYARD

SUSTAINABLE CITY-STATES

Cities sign Kyoto-type agreements

BRIGHT GREEN

Eco-cities attract "creative class" citizens, forming leading-edge centers of innovation in urban form, governance, employment and industry

Preserving vulnerable resources requires creative collaboration

Source: www.gemil.org

MEGA-CITY PLANET

More people live in cities than rural communities, globally—nearly all the largest cities in the world are in developing countries.

Source: www.foresight.com

CLIMATE REFUGEES

- Natural disasters create mass migrations
- Marginalized economies most vulnerable

SLUMS AS CENTERS OF INNOVATION

- Pioneers for efficient low-impact living
- New cooperative strategies
- Bottom-of-the-pyramid market opportunities

SMART URBAN ENVIRONMENTS

- Cameras, sensors and RFID recognize and inform
- Tagging shares digital knowledge about places

DIGITAL NATIVES, CIVIC SPACES

Youth media literacy and practices—tagging, commenting, podcasting—transforms relationship to physical spaces and creates new sense of civic responsibility.

GREEN ARCHITECTURE OPENS UP

Open-source building design and engineering catalyzes innovations in balancing low impact, affordability and aesthetics:

- Energy producing, ultra-efficient homes
- Urban roof gardens
- Design mimics nature

OPEN-SOURCE ENVIRONMENTALISM

Sharing environmental practices and IP to create an environmental knowledge commons

PML: PLANETARY MARKUP LANGUAGE

Universal data protocols for field research

LABS ON A CHIP

Support *in situ* environmental sampling and analysis

SMART WALLS

Micro- and nano-engineered sensors and processors make building materials responsive to users and environment

London's Plantation Place has a ventilation system inspired by human lungs

Source: http://www.arup.com/facadeengineering/project.cfm?pageid=1794

RE-ENGINEERING NATURE

- Conservation to restoration to optimization
- Designer ecosystems
- Re-sourcing natural resources

THE ENVIRONMENTAL DILEMMA

Effective green strategies need to identify:

- Fences: short-term costs with long-term benefits
- Traps: short-term benefits with long-term costs

ENVIRONMENTAL SERVICES

Markets for environmental services grow:

- 15-30% of food production depends on pollinators
- Trees store carbon and reduce stormwater runoff

ROGUE ECO-STATES

Some nation states benefit from the status quo and resist sustainable development

CONTROVERSIAL TESTING GROUNDS

Developing and undeveloped countries pilot green tools, fueling debates about:

- Environmental justice, self-governance and development
- Innovation, hacking, competition and exploitation

COLLABORATIVE ECO-MAPPING

- Bottom-up pollution mapping and environmental monitoring
- Flickr-based field data
- Earth Transparency Project

PARTICIPATORY PHILANTHROPY

- Social entrepreneurship
- Stakeholder, shareholder activism

WORK THE PLANET

Labor issues become a key force in sustainability debates

WASTE AS RESOURCE

New design and production methods create demand for waste as raw material

RAPID, FLEXIBLE MANUFACTURING

3D printers + computerized design trigger transformation of factories and manufacturing, and enable rapid prototyping of eco-friendly products

BIOLOGICAL RESOURCE MANAGEMENT

- Bioengineered fuel cells
- Cellulose converting synthetic termites
- Beetle-inspired fog collectors for desert water

CAP AND TRADE: A STORMY START

Pollution trading strategies seem promising but still must overcome skepticism and controversy. Debates will likely follow other strategies:

- Carbon tax
- Carbon offsets
- Carbon sequestration

ENVIRONMENTAL MARKETING

- Eco-labeling
- Brand differentiation
- Carbon information labels

INFORMED REFORMS?

New institutions and instruments to manage ecologies of risk, but they will need to be deeply informed by science to be effective

BLACKENED MARKETS

Demand for non-sustainables fueled by nouveau riche tech and petro economies

SMART NETWORKING

Online lifestyles, mobile communication and collective behavior take networking to the next level

A NEW SOCIALITY FUELS COMMONS-BASED STRATEGIES

Social network development and social identity creation drives values-based markets:

- Regenerative Commerce
- Viva Favela
- BioPlaneta

BIOPLANETA

Source: www.bioplaneta.com

Bioplaneta is a network of sustainable companies and cooperatives in Mexico

ECO-CONSUMER COLLECTIVES

Online buying groups redraw relationships between consumers and companies

HUMAN RESOURCES

- Employee health as new commons
- Programs to support employees' eco-friendly lifestyles

ENERGY: NEW COMMONS OR WEAPON?

States vary in their strategic approach to energy resources depending on geopolitics and presence of activism

ECONOMICS AND ECOSCIENCE: A CHAOTIC INTERSECTION

Climate change drives development of economic measures and markets for ecosystem services. However, non-linear behaviors and fragile ecosystems create a chaotic and complex arena of responsibilities.

INTANGIBLE WEALTH GENERATION

Investors get serious about

- Intellectual capital
- Social capital
- Natural capital

Metric Navigator helps companies find place in metrics jungle

- Carbon footprint per worker
- Employee health/wellness
- Turnover rate
- Employee civic engagement

EFFICIENCY AS CATALYST

- Energy efficiency as engine for radical innovation
- Clean fossil fuel solutions?

GLOBAL REINSURANCE

Reinsurance firms force insurance companies to account for climate change in their policies

THE BOTTOM LINE IS BACK

Deep self-interest, not altruism, drives adoption of energy efficiency and "green" strategies as sensible business practice.

SUPPLY WEB COMPLEXITIES

Increasing interdependencies = more opportunities (and need) for collaboration, but also more vulnerability to disruption and inertia.

DATA FILTERS

Tension between transparency, ubiquity of data, and need for accessibility

BEYOND COMPLIANCE

Companies must create value while navigating among diverse voices, all of whom may have different conceptions of sustainability

DISTRIBUTED ENERGY

Innovative strategies to generate and manage energy through lightweight infrastructures as viable alternative to centralized grids.

GRAEMEEN SHAKTI

Renewable energy microentrepreneurs

BOTTOM-UP CSR RATING

- Buyblue.org
- World Index for Social Environmental Responsibility
- Online eco-tagging

IMMERSIVE STRATEGY

Simulations, pervasive media and open modeling take off as standard learning tools

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CARBON COMMONS

Emissions as commons reframes decisions and choices

POWER AND ENERGY INNOVATION

Options for alternative energy increase:

- Biofuels: saw grass, cellulose ethanol algae fuels cells
- Solar: organic polymer solar goods
- Nuclear: molten salt thorium nuclear power
- Nano: nano-boosted photovoltaics

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HOW TO USE THIS MAP

FORESIGHT TO INSIGHT TO ACTION

The 2007-2017 Map of Future Forces Affecting Sustainability is a key step in a process of using foresight to reveal insights that can lead to more effective action in the present. You can use it as a simple road map, pointing to signposts in a sustainability landscape that you can not afford to overlook. But you can also tap much more deeply into it, using group processes to discover how your own organization—your strategies and your goals—will be shaped by the passage of the next ten years.

TAKE A FORESIGHT TOUR

The visual side of this map organizes IFTF's research in technology, environment, health and sustainability in a matrix format. Six rows, representing key external DRIVING FORCES shaping the future context for EHS, cross with seven columns—or IMPACT AREAS. The impact areas are different interpretations of, or perspectives on, sustainability that will register the various effects of the driving forces. The impact areas are not discrete silos but rather a framework for making sense of the sustainability landscape. On the other side of the map, you will find a text summary of the forecast structured around the seven impact areas. You can use the text as a narrative partner to the map.

SIGNALS

Located across the map are HOTSPOTS circled in blue. These are the big ideas of the forecast and make a good starting point for exploring the map.

Waving across the map are dozens of SIGNAL BANNERS: the indicators, innovations and examples that, when woven together, tell the stories from the forecast. Track several of them across the map to see what kind of story they tell together.

BUILD YOUR OWN FORESIGHT

No map is ever complete. So add to it. In a group or individually, use the columns and forecasts to organize your own intelligence about the future. Where do your most important internal forecasts fit in this bigger picture? What signals do they amplify?

CAPTURE INSIGHTS

Insight often emerges from juxtaposition. Circle signals (or forecasts) on the map that are most important to your organization. What makes them important—especially when you put them together? What dilemmas emerge and how can you creatively manage them?

LINK TO ACTION

Ultimately you want to link your foresight and insight to action. What are the next steps? The next step may simply be to collect more foresight. Or it may be to link specific signals to key indicators you need to track. Or it may be to translate an insight into an initiative. Try not to leave the map without jotting down at least one action step.

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