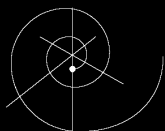


2009 Green Engineering Masters Forum

***GREEN PROJECT MANAGEMENT
5 Key Success Factors***

Dr. Brian Nattrass
Sustainability Partners



* Sustainability Partners *



NORDSTROM



CollinsWood

VANS



SUSTAINABILITY PARTNERS

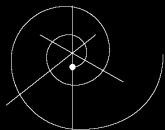




MISSION!

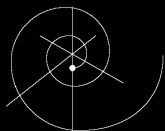
**Sustainability
must be perceived
to support the mission of the organization
in order to be accepted.**

aka: “the business case”





U.S. ARMY



SUSTAINABILITY PARTNERS



Security $\leftarrow = \rightarrow$ **Sustainability**



Security  Sustainability

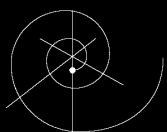
A NEW SECURITY PARADIGM:

*There can be no security
without sustainability,
and no sustainability
without security.*

NATIONAL SECURITY and the THREAT of CLIMATE CHANGE



www.securityandclimate.cna.org



SUSTAINABILITY PARTNERS



Military Advisory Board

GEN Gordon R. Sullivan (USA), MAB Chairman

Chief of Staff, Army

ADM Frank “Skip” Bowman (USN)

Director, Navy Nuclear Power

Lt Gen Lawrence P. Farrell Jr. (USAF)

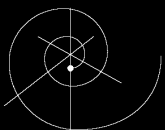
Chief Planner HQ USAF

VADM Paul G. Gaffney II (USN)

ONR and NDU

GEN Paul Kern (USA)

Army Materiel Command





Military Advisory Board

ADM T. Joseph Lopez (USN)

Commander, U.S. Navy Europe

ADM Donald “Don” L. Pilling (USN)

Vice Chief, U.S. Navy

ADM Joseph W. Prueher (USN)

Pacific Commander; U.S. Ambassador, China

VADM Richard H. Truly (USN)

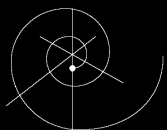
NASA Administrator; Astronaut

Gen Charles “Chuck” Wald (USAF)

Deputy U.S. European Commander

Gen Anthony C. “Tony” Zinni (USMC)

Commander Central Command





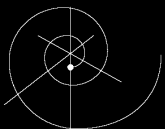
Perspective on Scientific Debate

“ **We never have 100% certainty.**

**If you wait until you have 100% certainty,
something bad is going to happen
on the battlefield.**

That's something we know.”

GEN Gordon R. Sullivan (USA), MAB
Chairman
Chief of Staff, Army



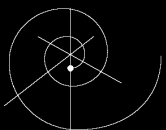


MAJOR FINDINGS

Finding: Serious Threat to National Security

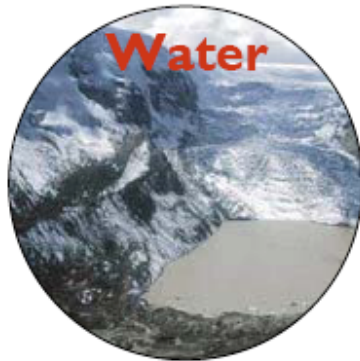
“ You have very real changes in natural systems that are most likely to happen in **regions of the world that are already fertile ground for extremism.** ”

ADM T. Joseph Lopez (USN)
Commander, U.S. Navy Europe

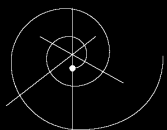


Threats to Natural & Human Systems

Threats

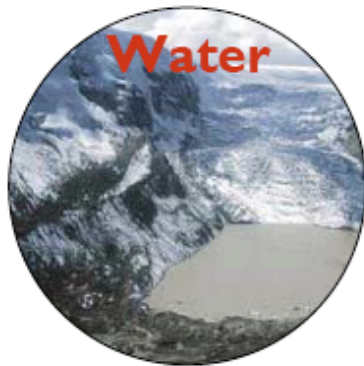


Case in Point: Darfur

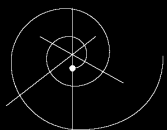


Threats to Natural & Human Systems

Threats



Case in Point: Somalia



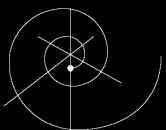


Finding: Threat Multiplier

“Unlike the challenges that we are used to dealing with, these will come upon us extremely slowly, but come they will, and they will be **grinding** and **inexorable**.

But maybe more challenging is that they will **affect every nation, and all simultaneously**.”

VADM Richard H. Truly (USN)
NASA Administrator; Astronaut



2007

POSTURE STATEMENT

A CAMPAIGN QUALITY ARMY WITH JOINT AND EXPEDITIONARY CAPABILITIES



CALL TO DUTY
BOOTS ON THE GROUND



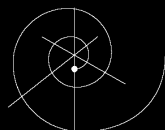
“The state of the Army”

Addendum K (Army Sustainability Strategy)

Army Sustainability is a comprehensive, systems approach to planning and decision-making designed to sustain the natural infrastructure, which includes the land, water, air, and energy resources required to conduct our mission.

Advances in technology, ever-increasing global population, and urbanization have effectively made the world smaller. They have placed greater stresses on the world's interconnected human, economic, and natural systems. Local and regional issues, such as famine, natural disasters, ecological degradation, economic decline, political upheaval, and disputes over precious and sometimes scarce natural resources, are evolving into global issues that influence how the United States must respond and interact—through political, economic, and when necessary, military engagement.

Fielding new weapons systems, adjusting tactics, and consolidating forces through Base Realignment and Closure and global repositioning all impact - as well as are impacted by - our ability to sustain the natural infrastructure, which includes the land, water, air, and energy resources required to conduct our mission.





SUSTAINABLE TRAINING

Conservation management practices ensure training lands remain viable to support current and future realistic live training, which is essential for troops to be fully prepared to fight and win.



SUSTAINABLE RANGE

The Army manages about 15.2 million acres of land, 98 percent of that is set aside for ranges and training.



SUSTAINABLE INDUSTRIAL OPERATIONS

The Army overhauled and repaired more than 85,000 weapon systems, major end items, and components in FY 2004.



SUSTAINABLE LOGISTICS SUPPORT

Reducing our logistics footprint conserves resources and minimizes waste generation.

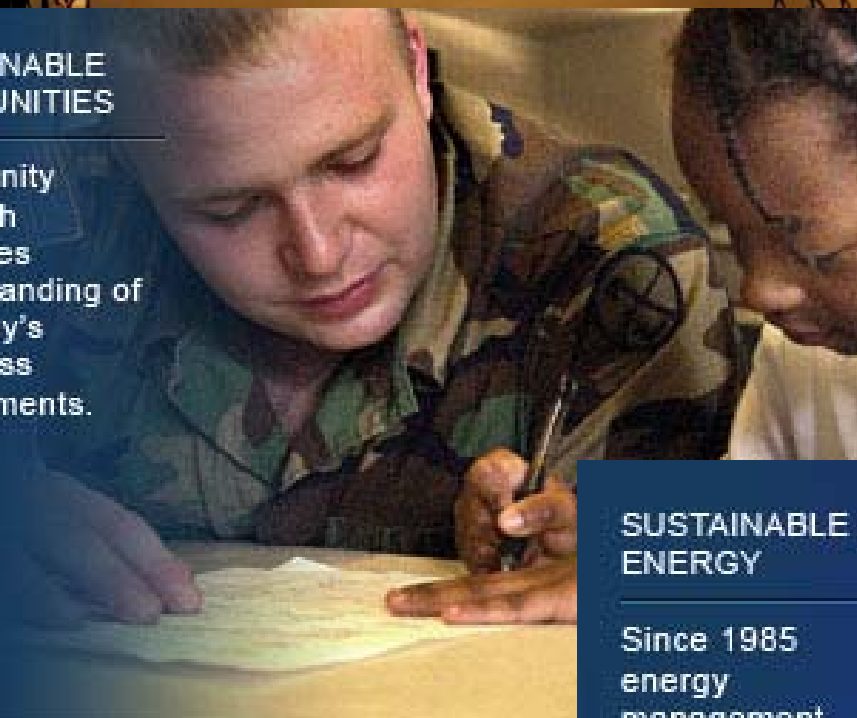




U.S. ARMY SUSTAINABILITY

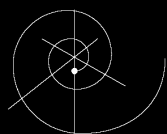
SUSTAINABLE COMMUNITIES

Community outreach increases understanding of the Army's readiness requirements.



SUSTAINABLE ENERGY

Since 1985 energy management programs have reduced energy use in Army buildings by 30.1 percent.





U.S. ARMY

SUSTAINABILITY REPORT 2007



SUSTAIN THE MISSION
SECURE THE FUTURE

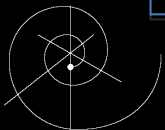


#1 - GRI



5 KEY SUCCESS FACTORS FOR SUSTAINABILITY INTEGRATION:

- 1. Support the mission -- know the business case for sustainability**
- 2. Be an effective agent of change**

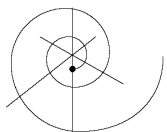


The adoption of a given innovation in a social system follows a **predictable pattern**:

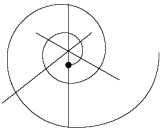
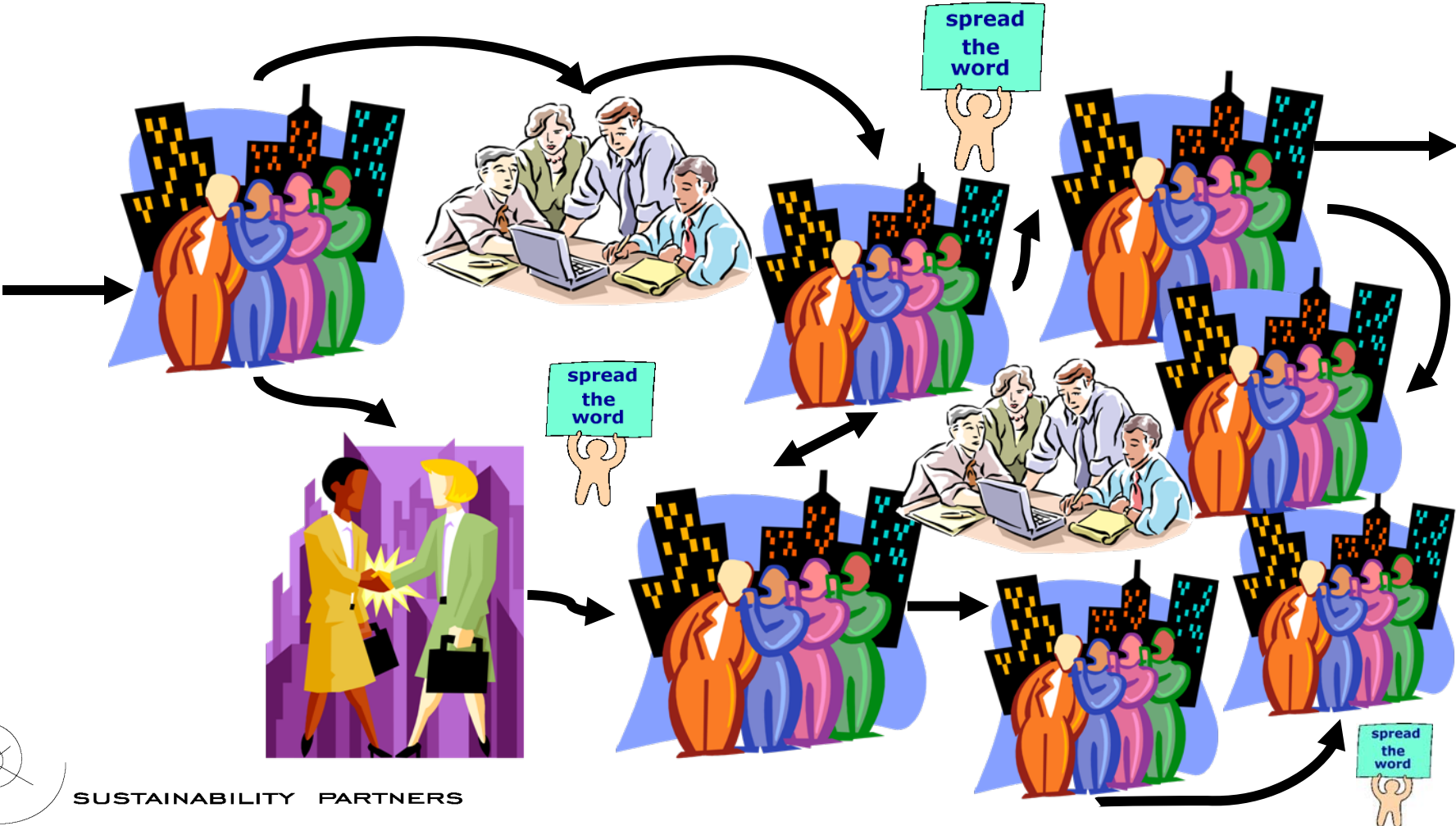
It starts with a **small group**, even a **single person** who has an idea that is **new** to the culture of the system.

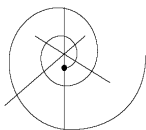
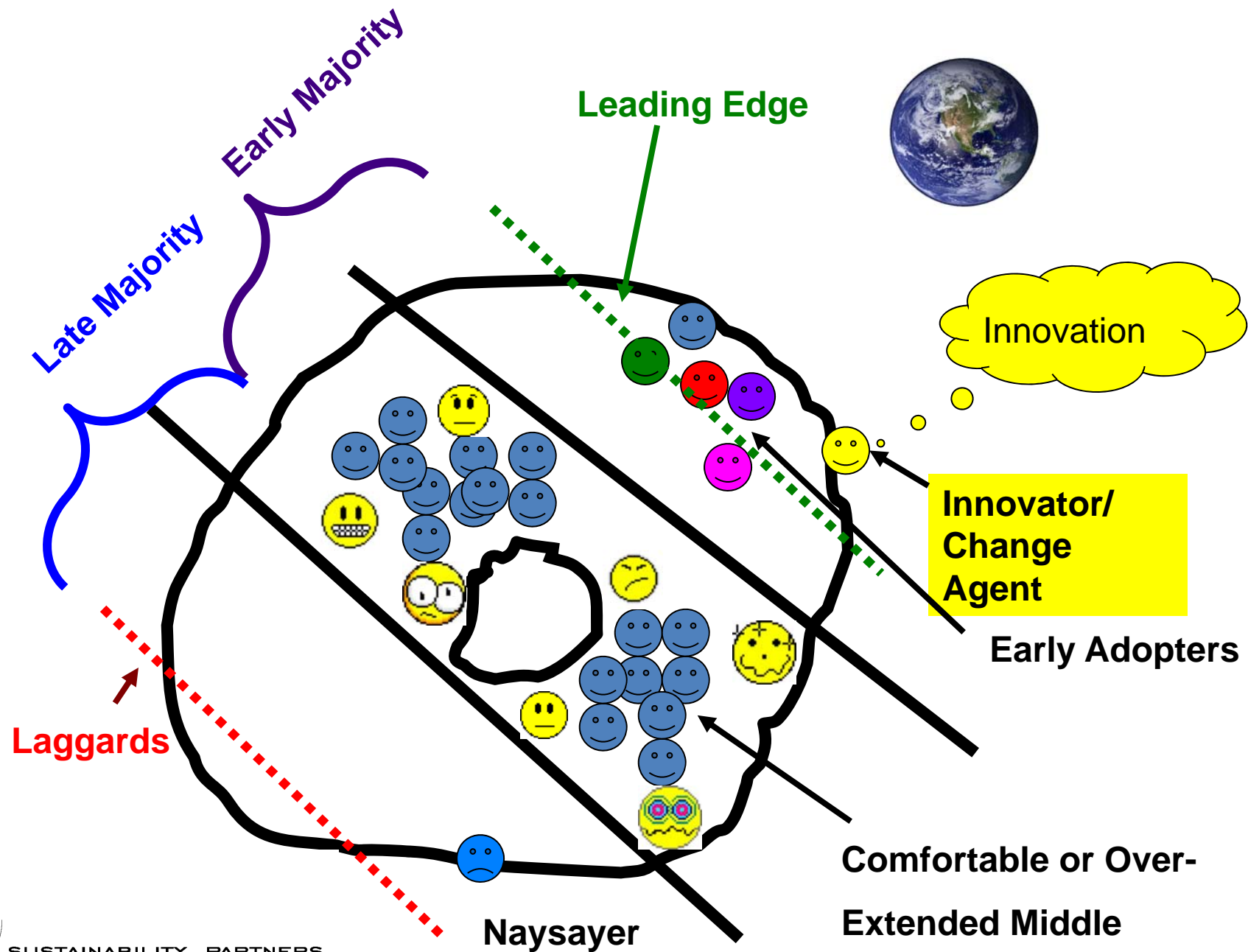


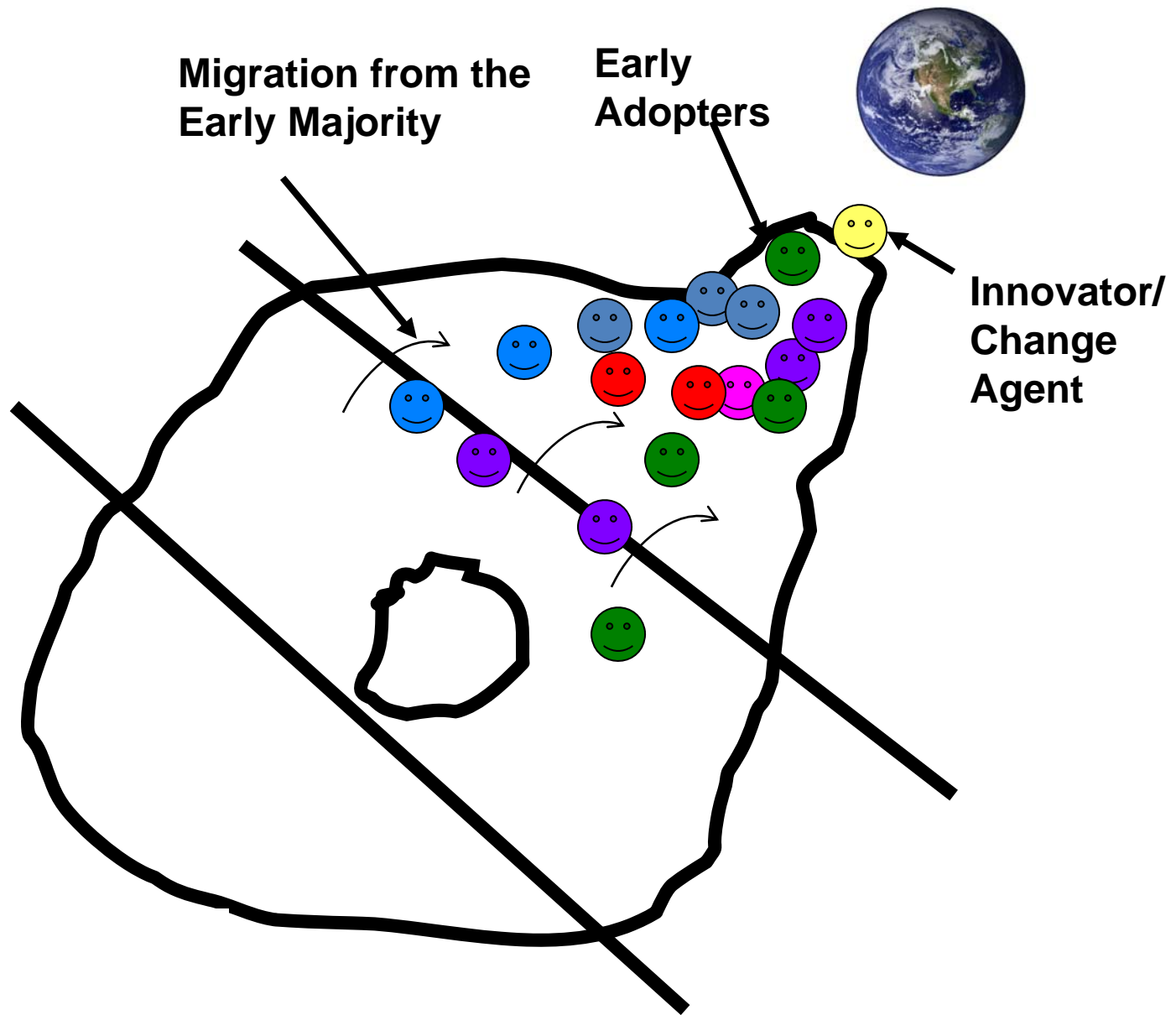
It spreads *slowly* at first through the work of change agents who **actively** promote it.



As more change agents adopt the innovation and *communicate* it to others, more early adopters join the process until the idea reaches critical mass and “takes-off” -- it reaches the “tipping point”.





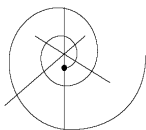


Migration from the
Early Majority

Early
Adopters



Innovator/
Change
Agent



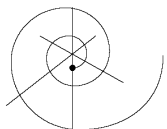
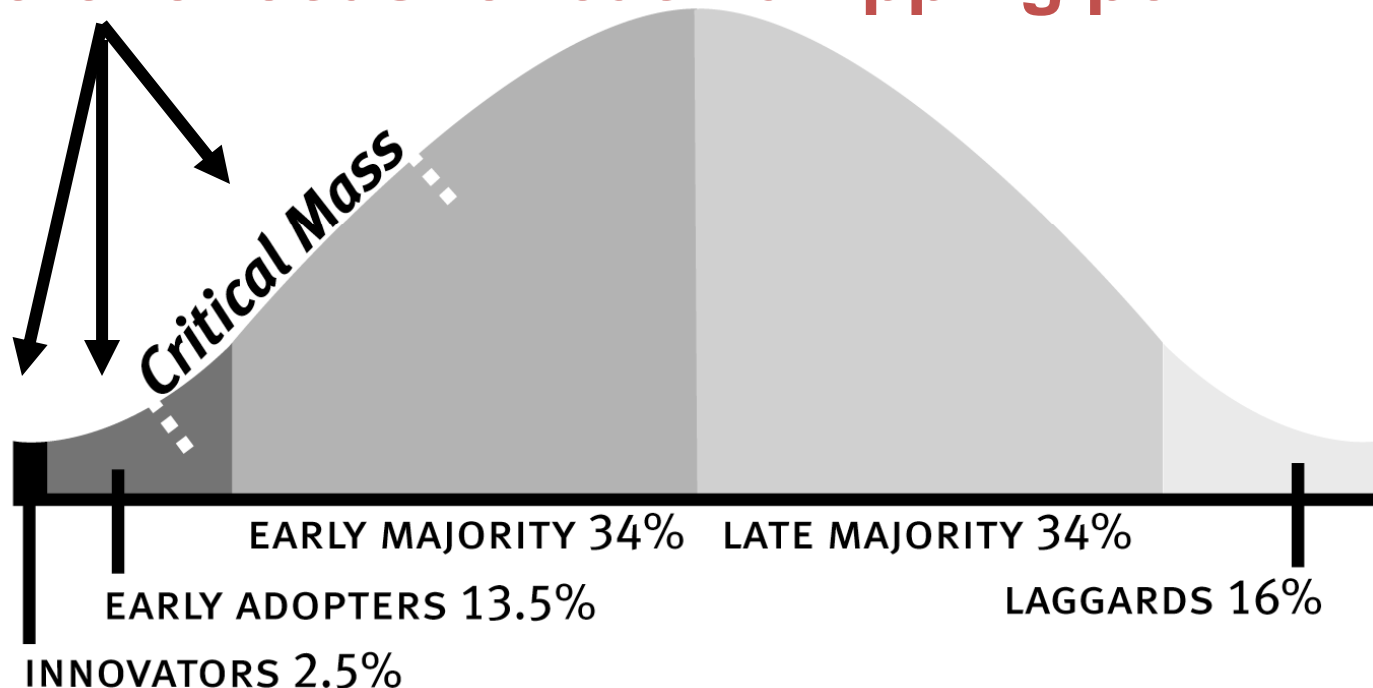
The process looks like this.


Rate of Adoption of an Innovation Over Time

Figure 3.2

Source: Adopter Categorization on the Basis of Innovativeness
Adapted from: Rogers, 1995, pg. 262

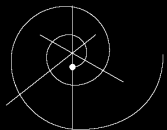
Where to focus to reach a tipping point





Perceived Characteristics of a Successful Innovation (including Sustainability):

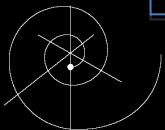
1. Relative advantage
2. Compatibility
3. Complexity
4. Trialability
5. Observability





5 KEY SUCCESS FACTORS FOR SUSTAINABILITY INTEGRATION:

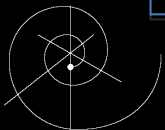
- 1. Support the mission -- know the business case for sustainability**
- 2. Be an effective agent of change**





5 KEY SUCCESS FACTORS FOR SUSTAINABILITY INTEGRATION:

- 1. Support the mission -- know the business case for sustainability**
- 2. Be an effective agent of change**
- 3. Have a sustainability North Star -- a point of reckoning to keep you on track**

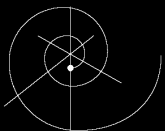




DEFINING 'SUSTAINABILITY'

CLASSIC (1987 World Commission on Environment and Development / Brundtland Report)

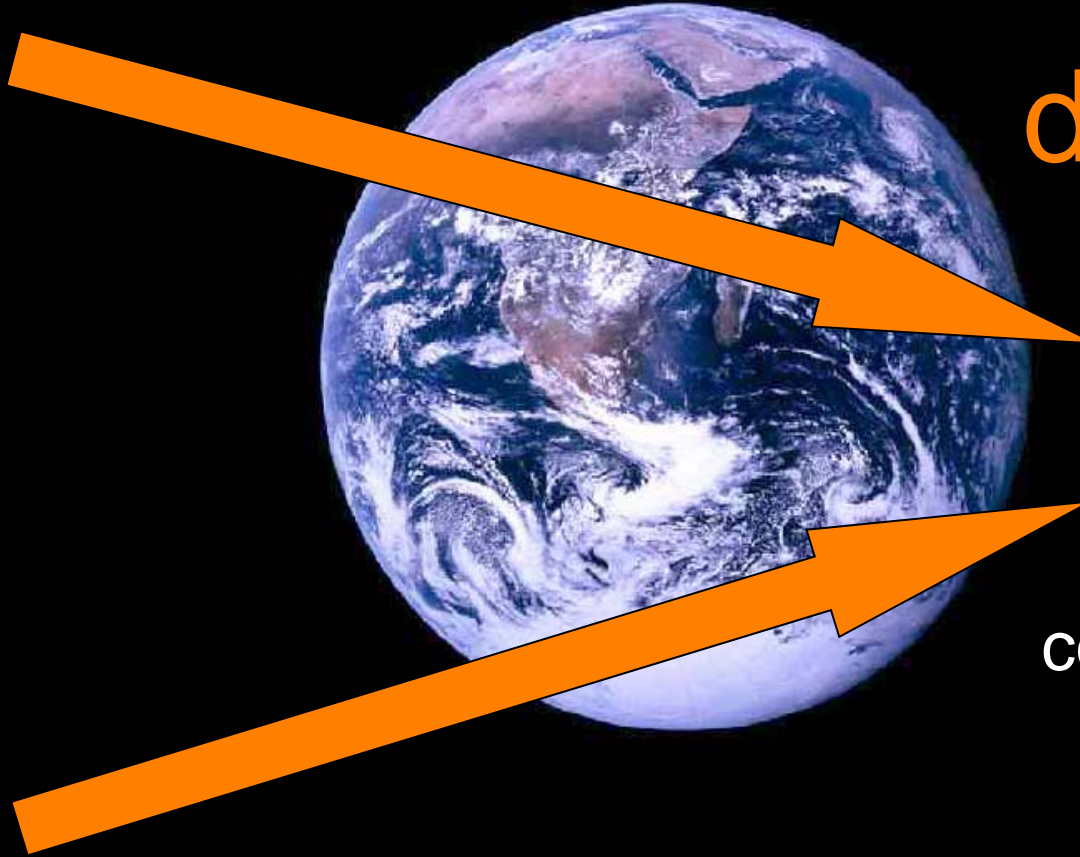
Meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.



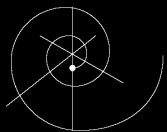


Meta-trends: Global Driving Forces

life supporting
resources
declining



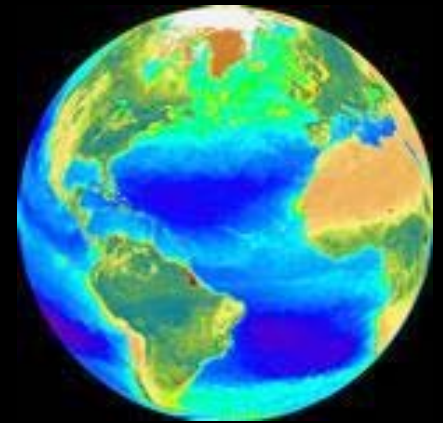
consumption of
life supporting
resources
rising



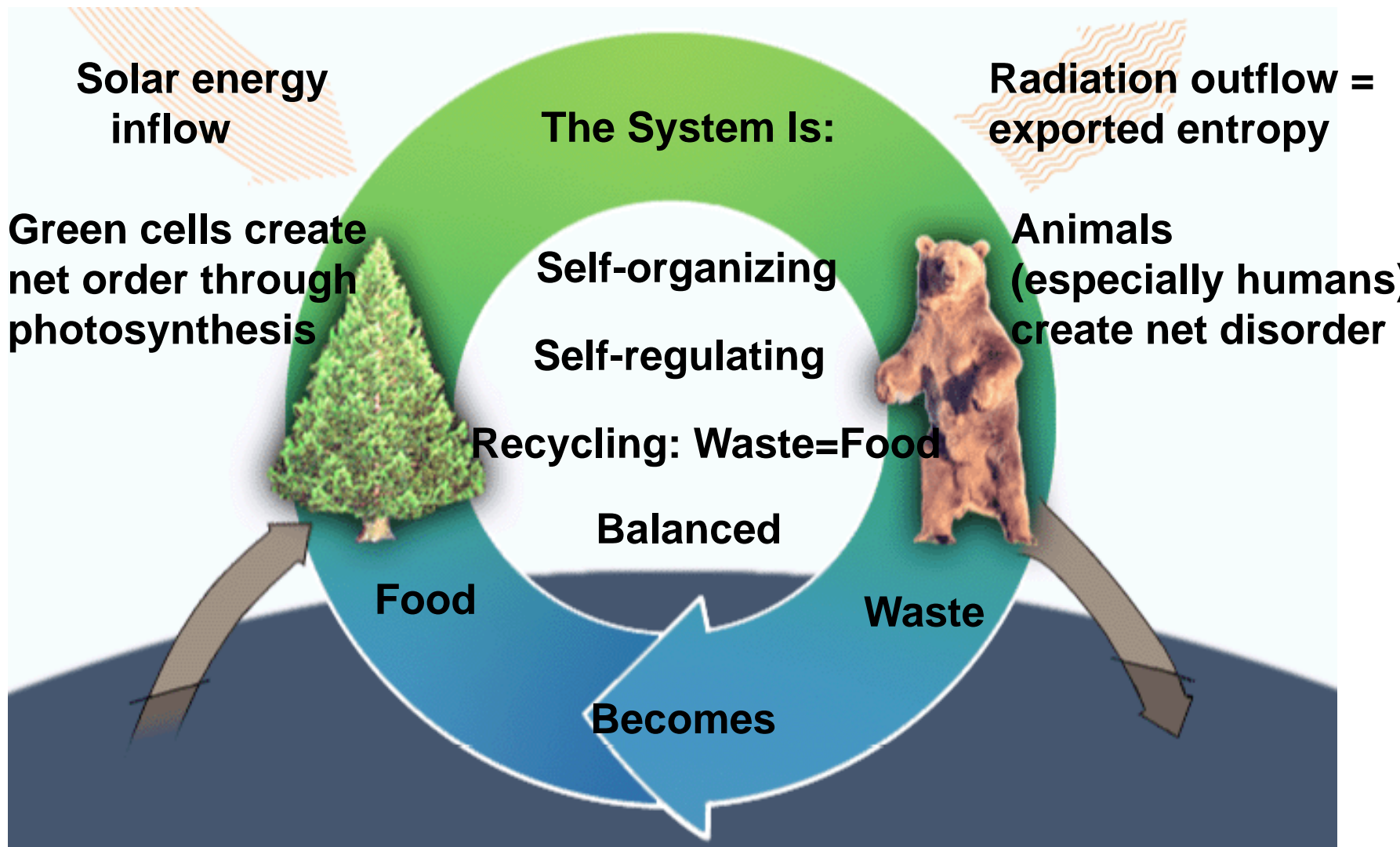


Meta-trends: Global Driving Forces

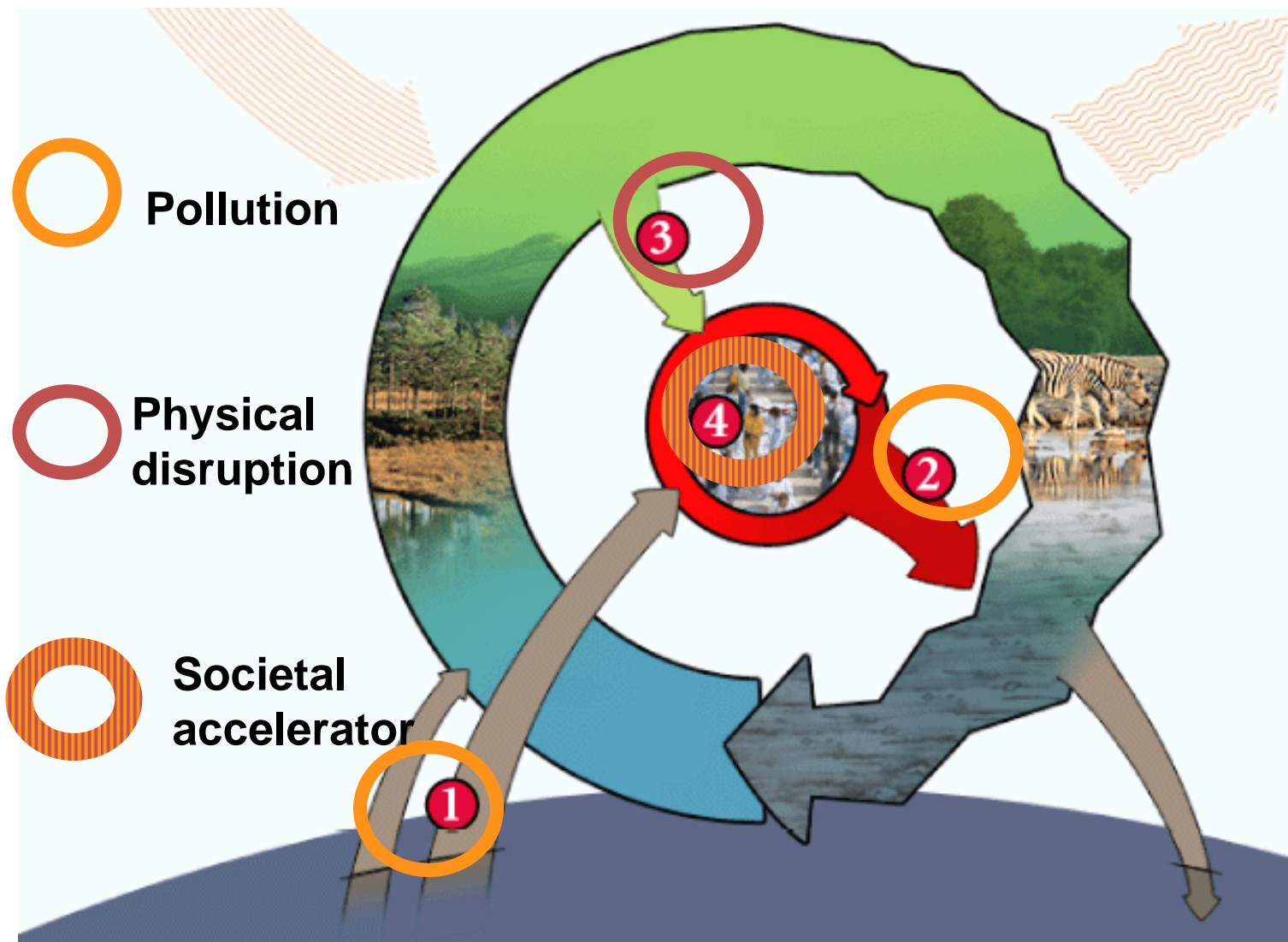
- Climate change
- Ice caps melting
- Oceans warming
- Rising seas
- Reefs at risk
- Water scarcity
- End of easy oil
- Rapidly rising population
- Growing income disparities
- And more....



Natural Cycles (The way things work)



Present Society



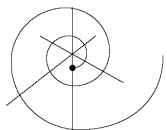
How would you design an unsustainable society?

Sustainability Condition 1

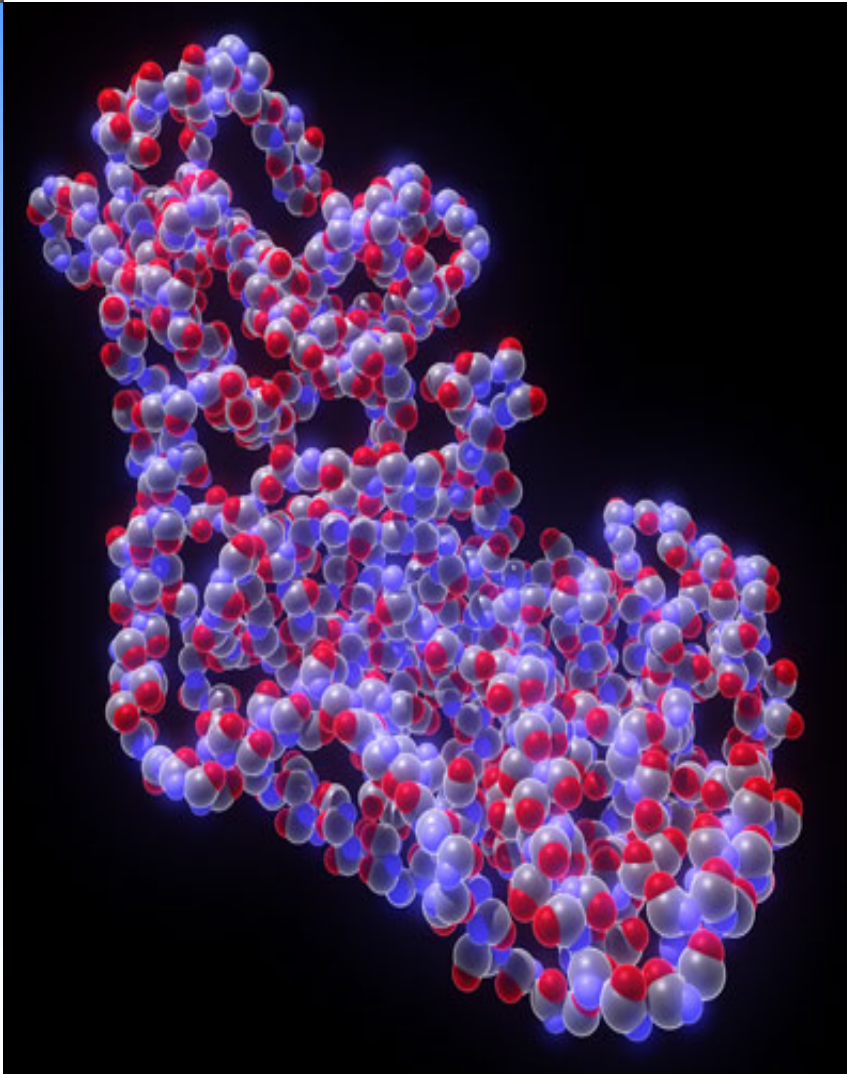


In a sustainable society, nature is not subject to increasing concentrations of substances from underground.

This means systematically reducing dependence on fossil fuels, and substituting certain minerals that are scarce in nature with others that are more abundant, using all mined materials efficiently.

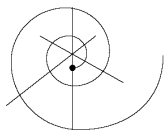


Sustainability Condition 2

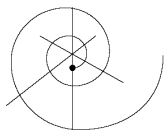
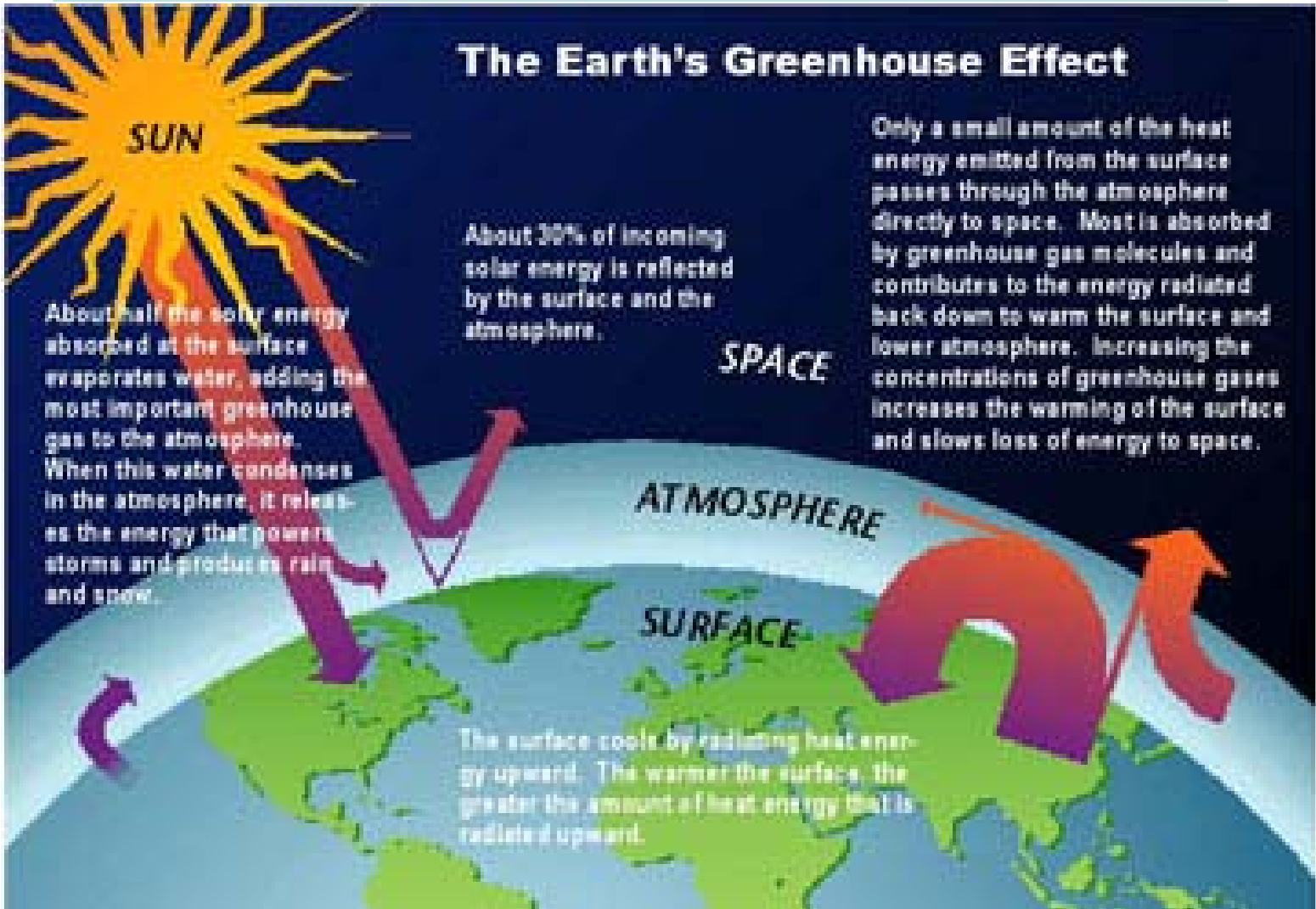


In a sustainable society, nature is not subject to increasing concentrations of synthetic chemicals.

This means systematically reducing dependence on synthetic chemicals known, or suspected to be, harmful to living systems.



SP #1&2: Greenhouse Gases (GHGs) and Climate Change



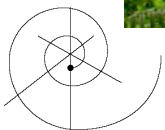
Sustainability Condition 3



In a sustainable society, nature is not subject to increasing physical degradation.

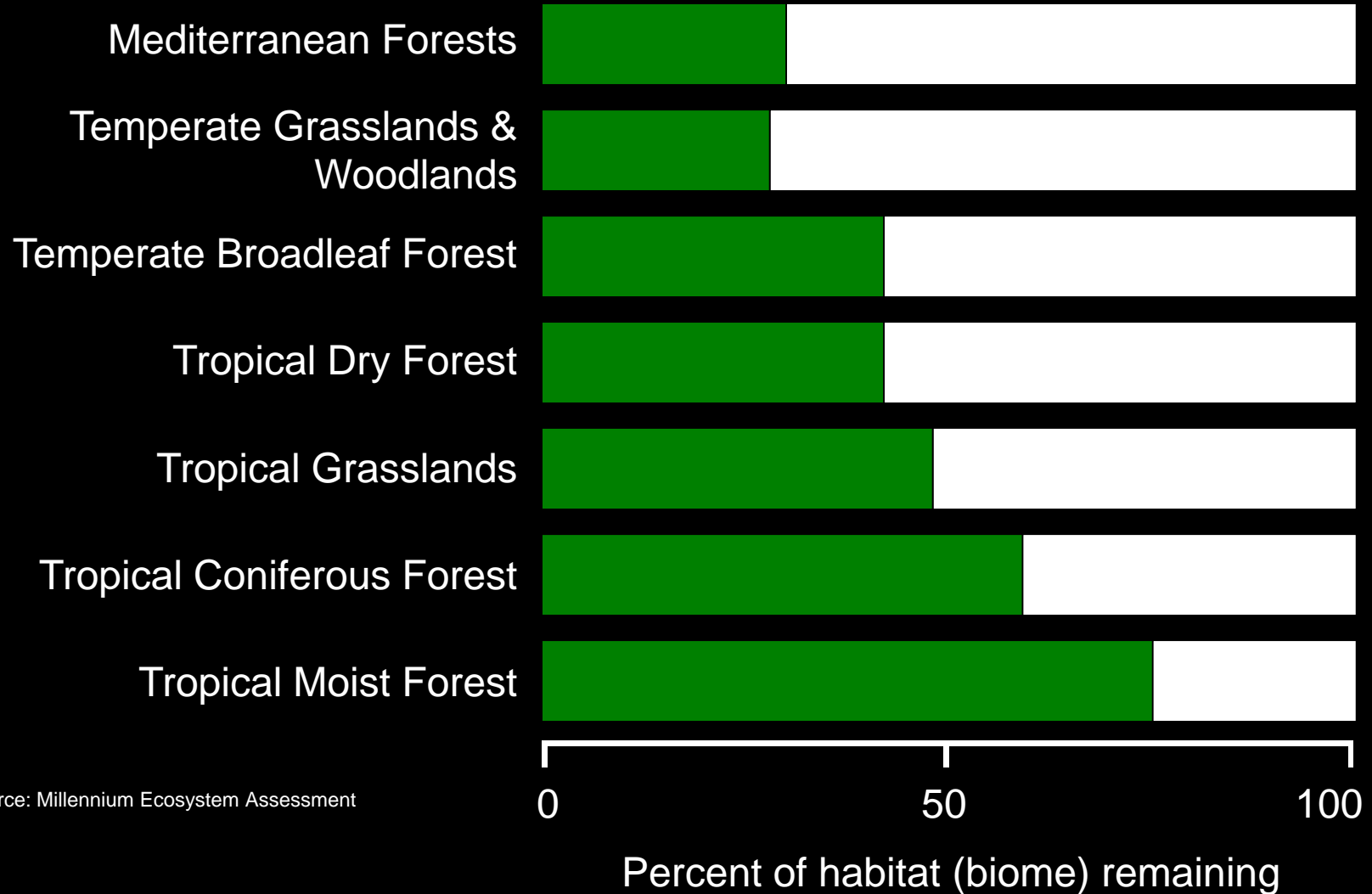


This means that in a sustainable society, the productive surfaces of nature are not diminished in quality or quantity, and we must not harvest nature beyond its capacity to regenerate.

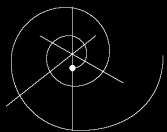




Habitat Loss



Source: Millennium Ecosystem Assessment



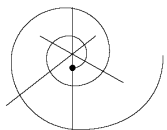
SUSTAINABILITY PARTNERS



Sustainability Condition 4

In a sustainable society, human needs are met worldwide.

This means using resources efficiently, fairly and responsibly, so that the needs of people on whom we have an impact (near and remote), and the future needs of people not yet born, stand the best chance of being met.





NORTH STAR: 4 Conditions for a Sustainable Society

[ABBREVIATED]

Nature is not subject to increasing:

- 1 ... concentrations of material from underground,
- 2 ... concentrations of synthetic chemicals,
- 3 ... degradation by physical means;
and in that society,
- 4 ... human needs are met worldwide.



Using the 4 Sustainability Conditions: consider how NASA products & processes:

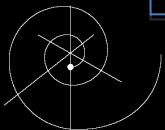
1. Use or depend on substances extracted from the Earth's crust (e.g. hydrocarbons, heavy metals) and potentially contribute to their accumulation in nature?
2. Use or depend on substances made by society (e.g. toxic material, synthetic compounds) and potentially contribute to their accumulation in nature?
3. Depend upon, or potentially contribute to the physical destruction of nature?
4. Meet or impact human needs?

These 4 conditions of sustainability can become DESIGN CRITERIA for new products & processes.



5 KEY SUCCESS FACTORS FOR SUSTAINABILITY INTEGRATION:

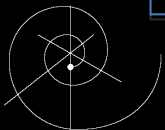
- 1. Support the mission -- know the business case for sustainability**
- 2. Be an effective agent of change**
- 3. Have a sustainability North Star -- a point of reckoning to keep you on track**





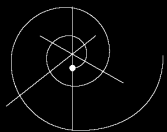
5 KEY SUCCESS FACTORS FOR SUSTAINABILITY INTEGRATION:

- 1. Support the mission -- know the business case for sustainability**
- 2. Be an effective agent of change**
- 3. Have a sustainability North Star -- a point of reckoning to keep you on track**
- 4. Use a sustainability planning framework**



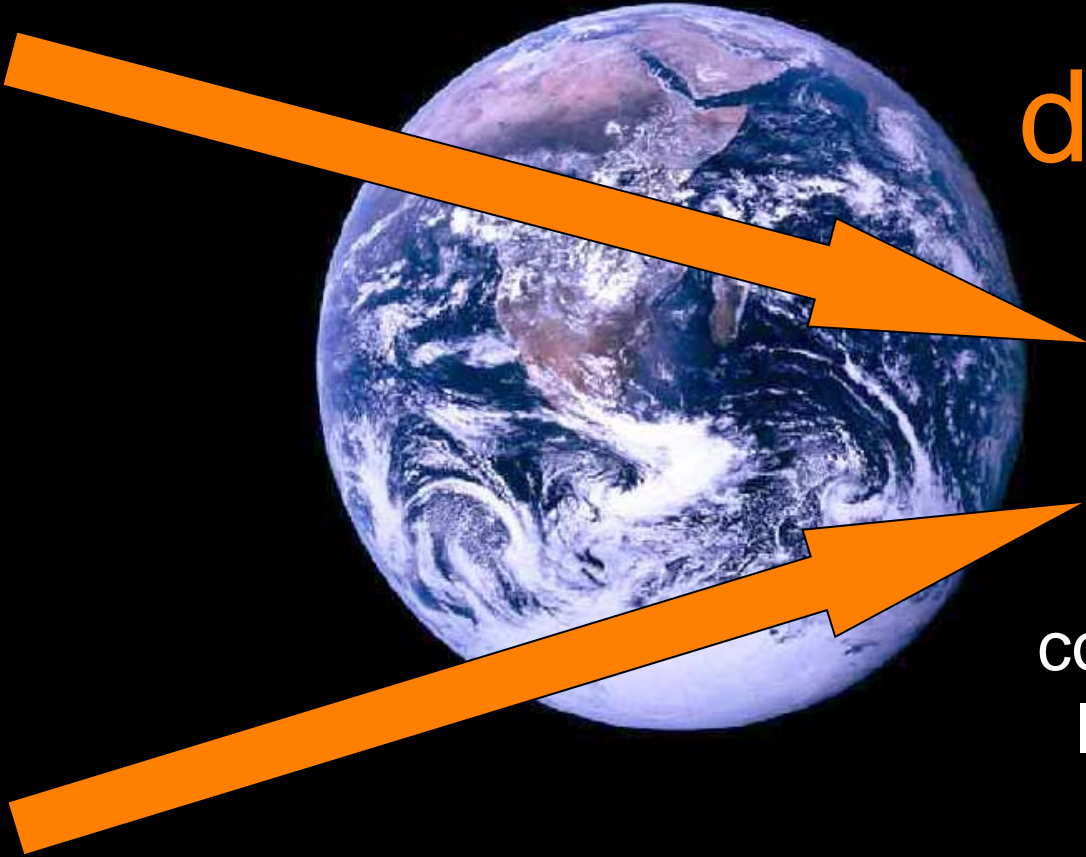


Sustainability: A to G Strategic Planning Framework



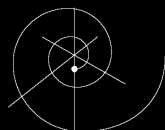


Meta-trends: Global Driving Forces

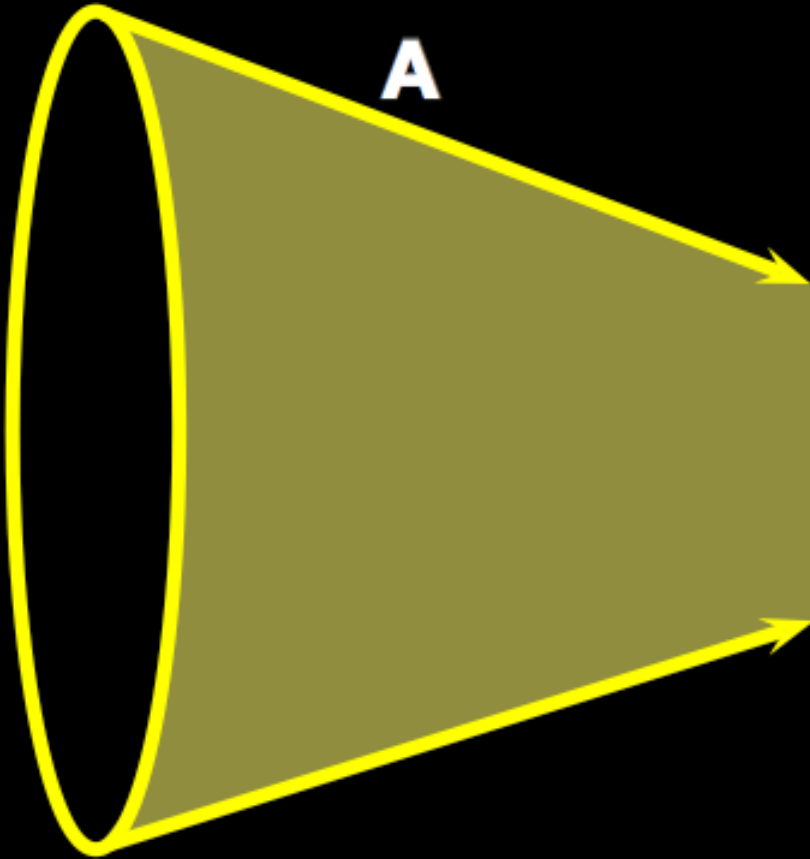


life supporting
resources
declining

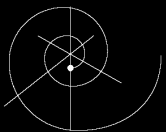
consumption of
life supporting
resources
rising



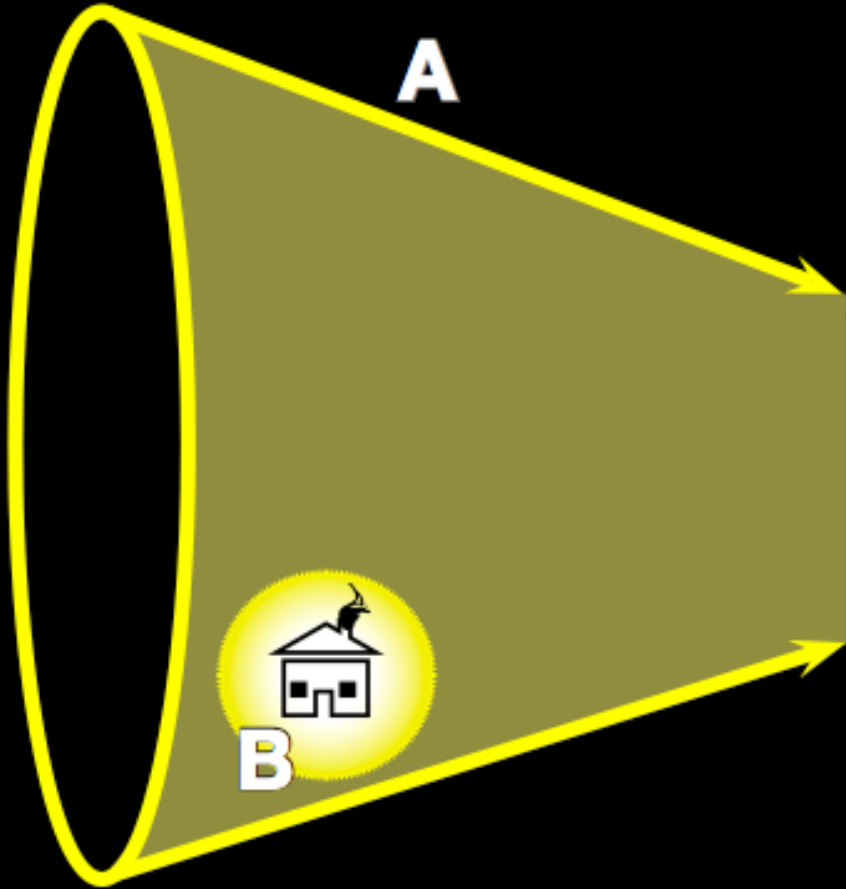
Strategic Sustainability Planning Model



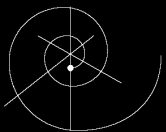
**AWARENESS
& EDUCATION**



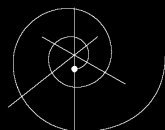
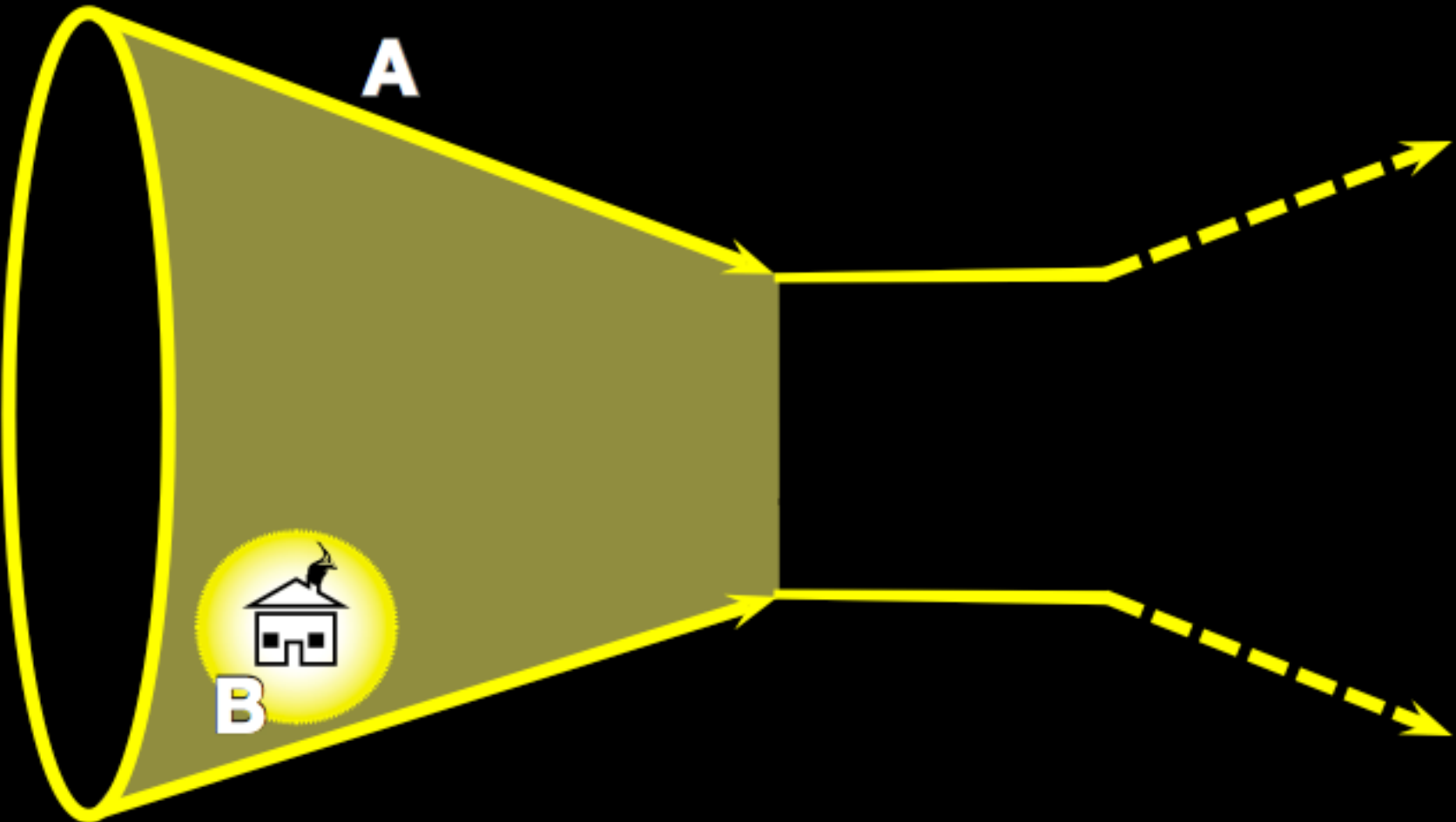
Strategic Sustainability Planning Model



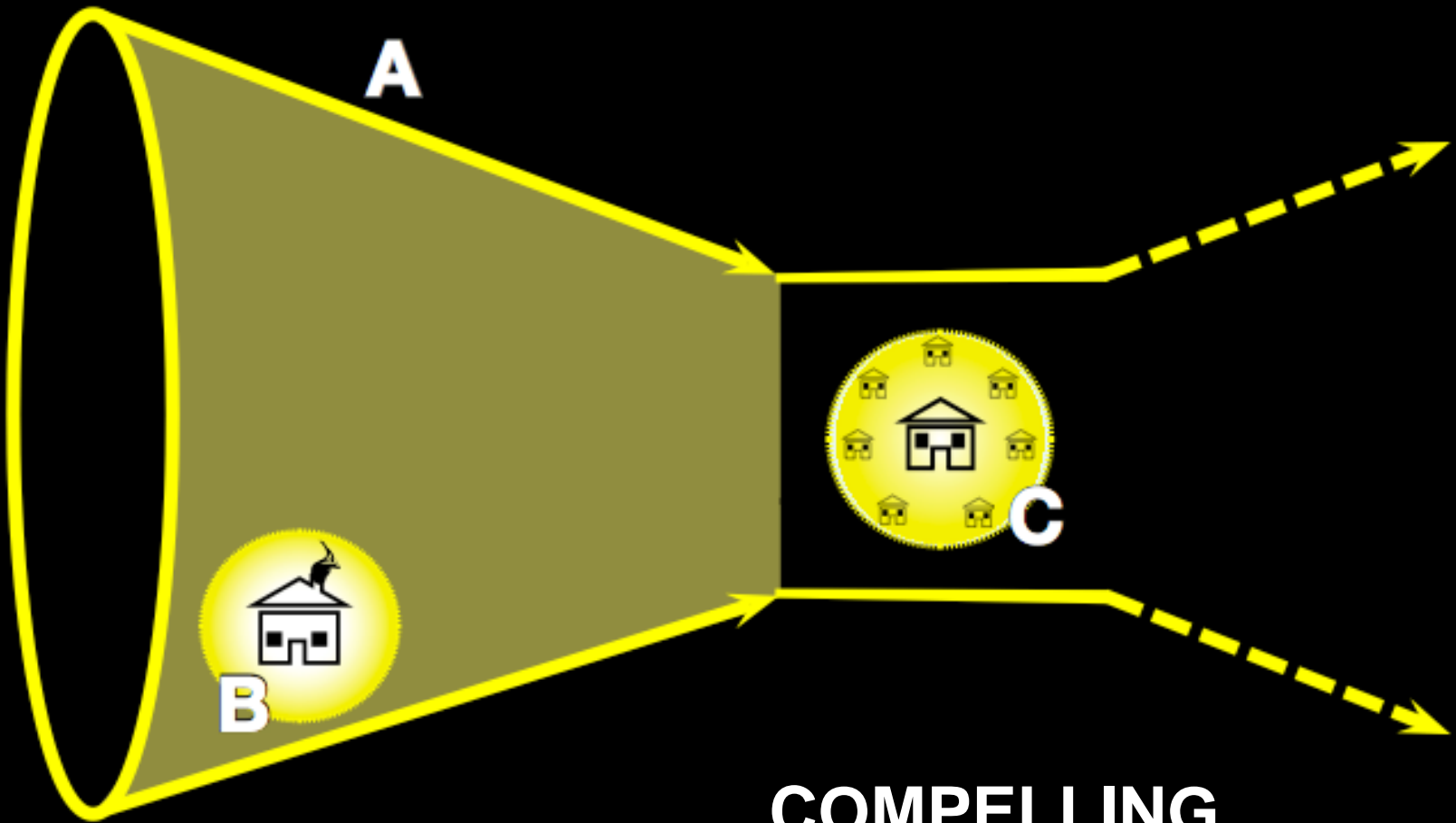
**BASELINE
DATA**



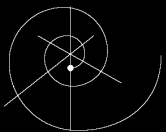
Strategic Sustainability Planning Model



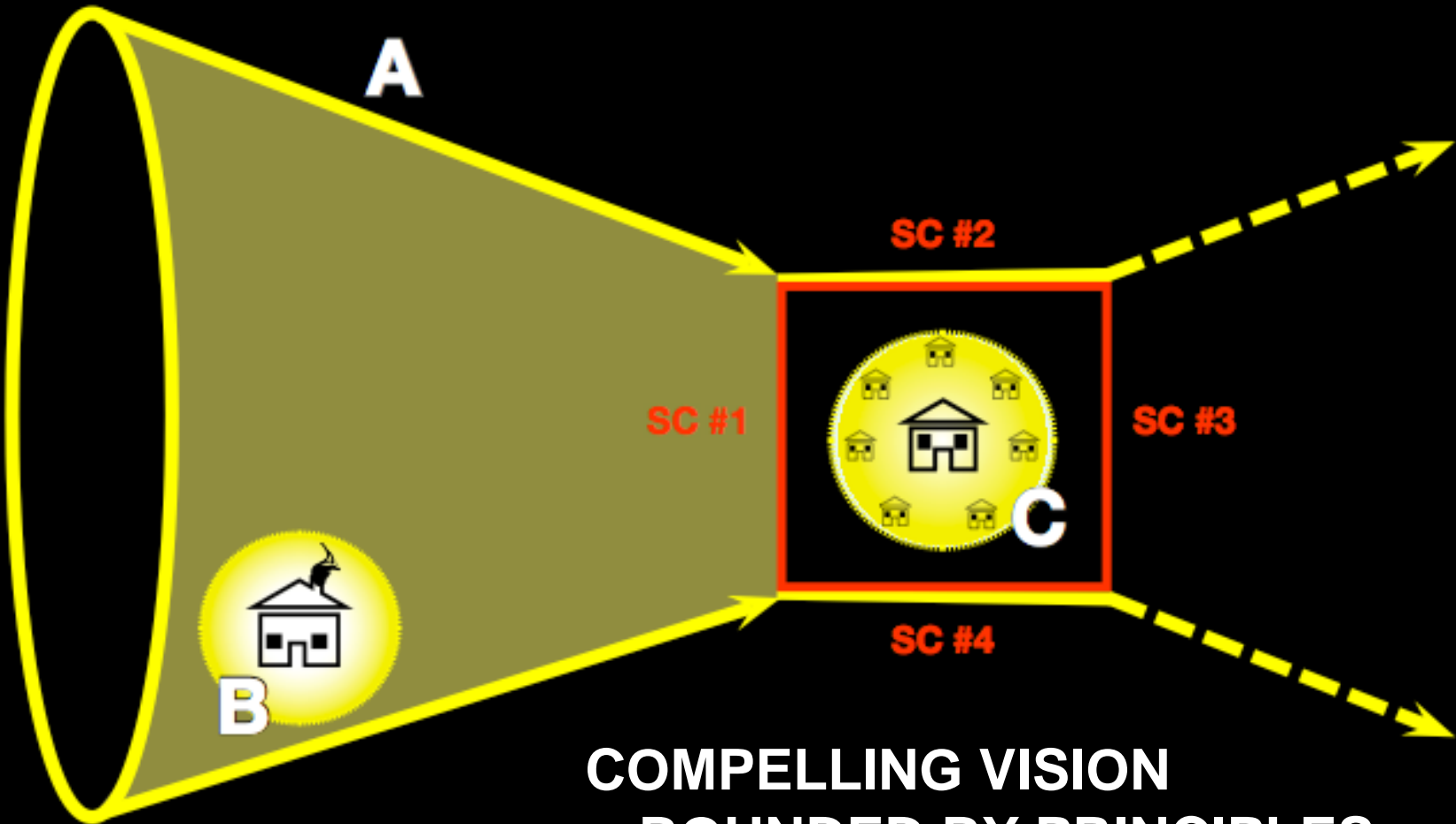
Strategic Sustainability Planning Model



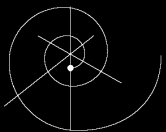
**COMPELLING
VISION**



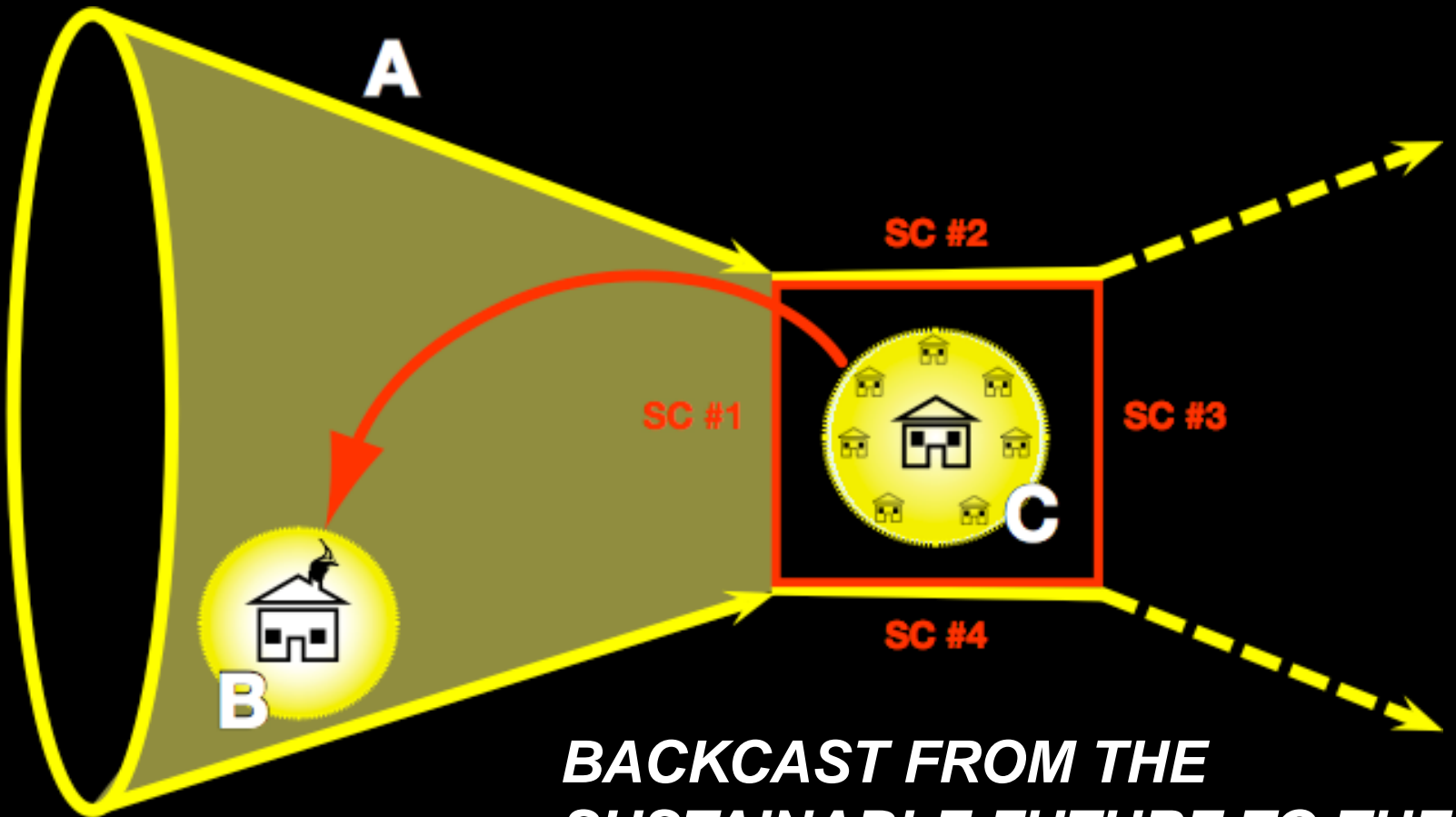
Strategic Sustainability Planning Model



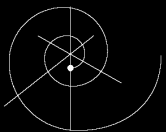
**COMPELLING VISION
-- BOUNDED BY PRINCIPLES
OF SUSTAINABILITY**



Strategic Sustainability Planning Model



***BACKCAST FROM THE
SUSTAINABLE FUTURE TO THE
UNSUSTAINABLE PRESENT***





The McGraw-Hill Companies

BusinessWeek

JULY 21, 2008

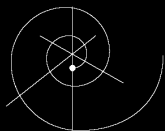
www.businessweek.com

Imagine a world

in which socially responsible and eco-friendly practices actually boost a company's bottom line. It's closer than you think. **BY PETE ENGARDIO (P.50)**



PLUS
Chrysler:
Dr. Z gets
a checkup



SUSTAINABILITY PARTNERS



“I have a dream vehicle — it is a vehicle that makes the air cleaner the more one drives it, a safe vehicle that does not harm people in any way, a vehicle that serves as a base for sending and receiving information, and a vehicle that actually improves one’s health.

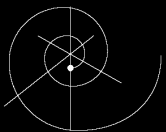
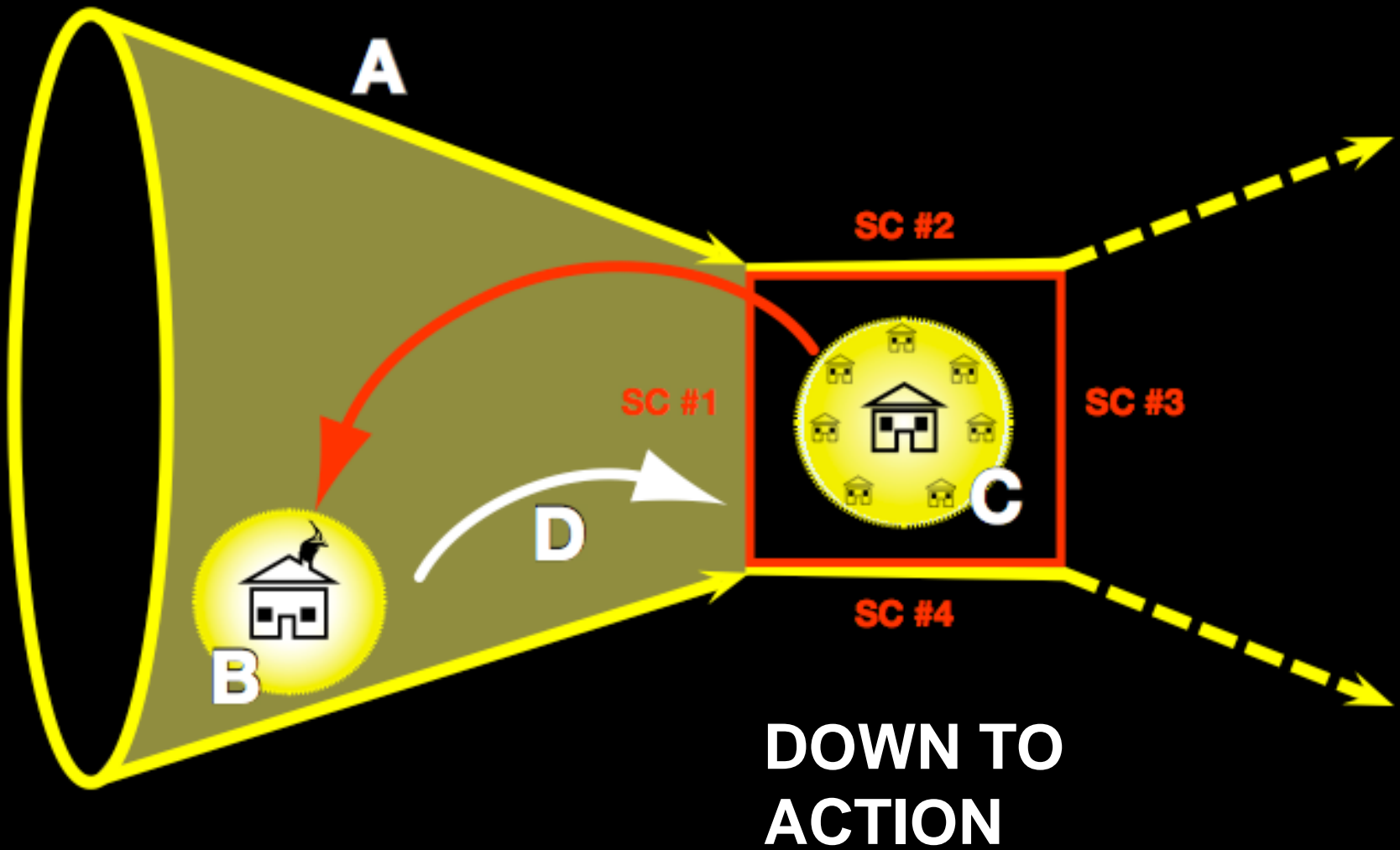
Dreams are not bound forever to the dream world. I take this to mean that by continually working hard toward one’s dream it is possible to come closer to making it a reality.”

Katsuaki Watanabe

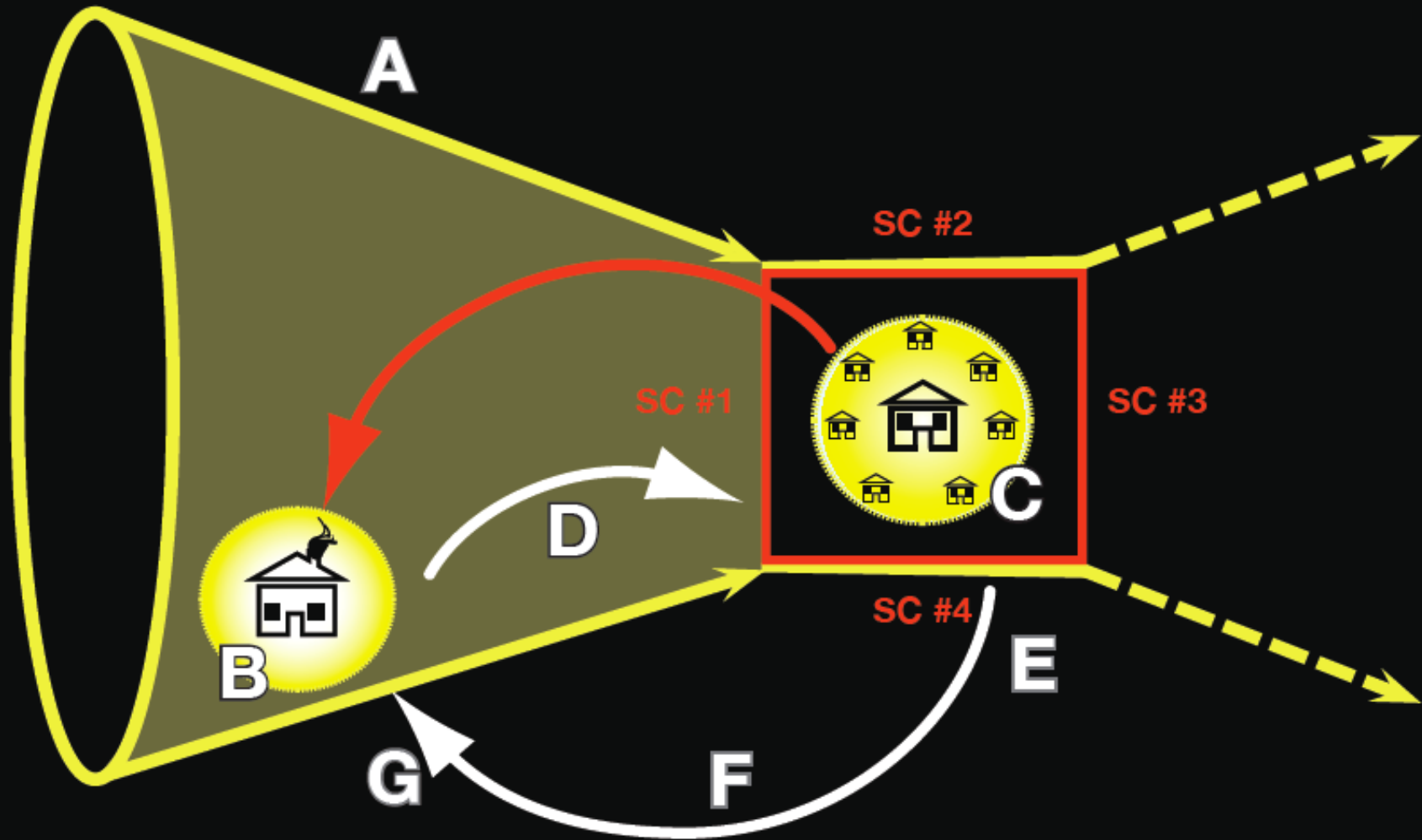
President, Toyota Motor Corporation



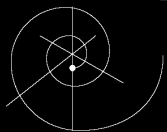
Strategic Sustainability Planning Model



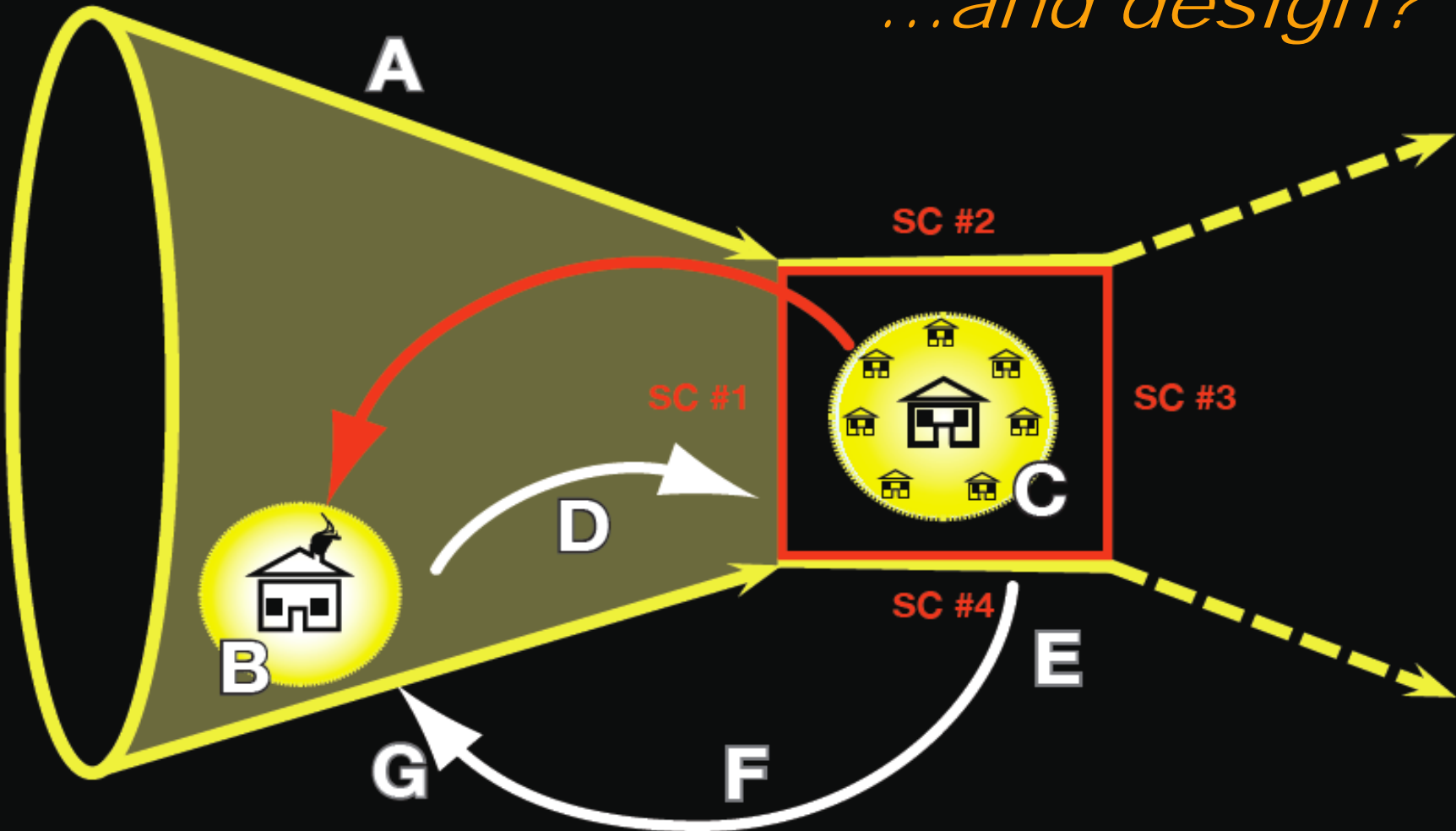
Strategic Sustainability Planning Model



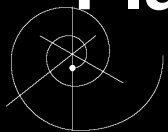
E-EVALUATION F-FEEDBACK G-GETTING BETTER



*What future can we imagine...?
...and design?*



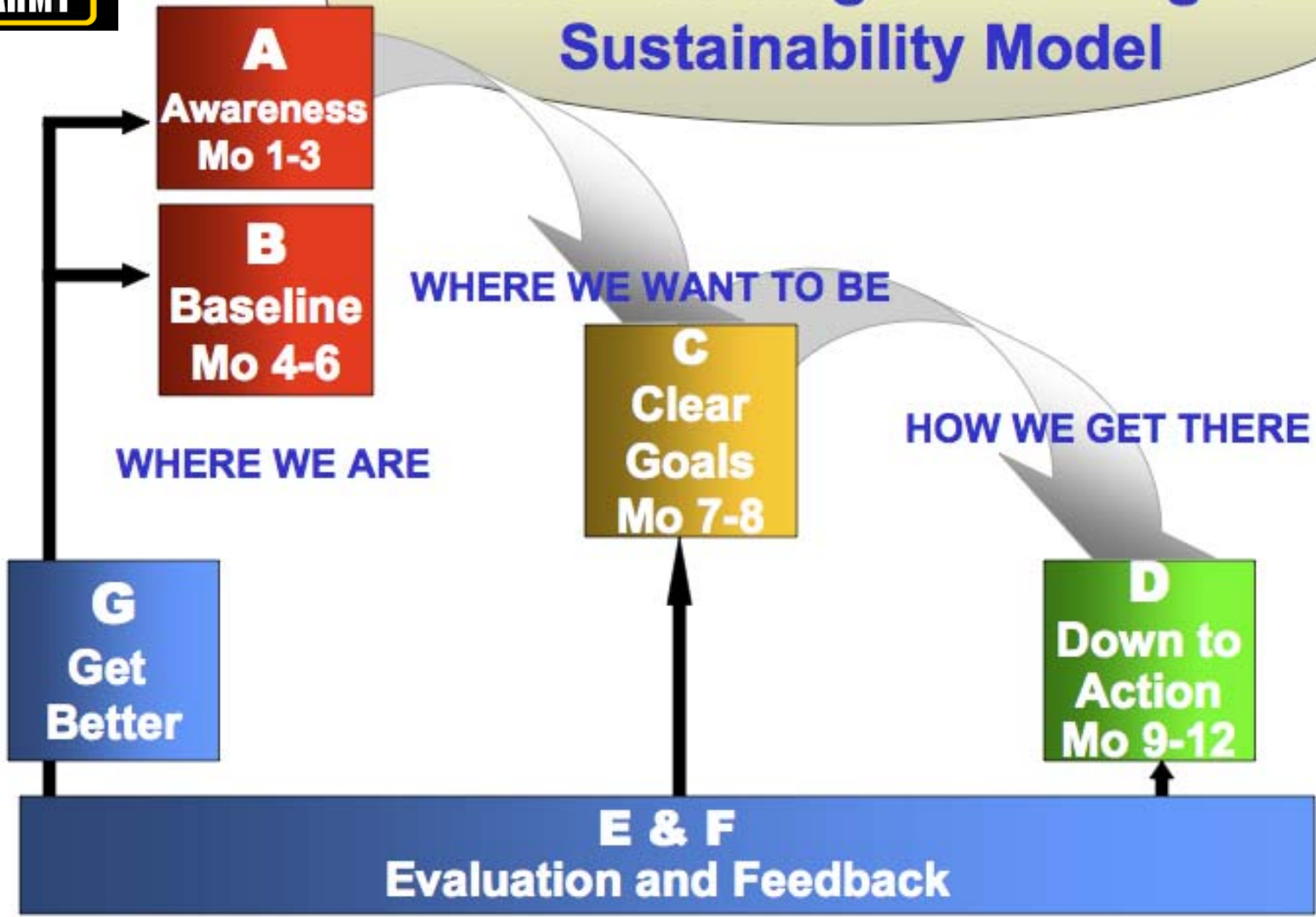
Planning & designing toward a compelling vision





U.S.ARMY

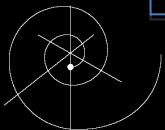
IMCOM Strategic Planning for Sustainability Model





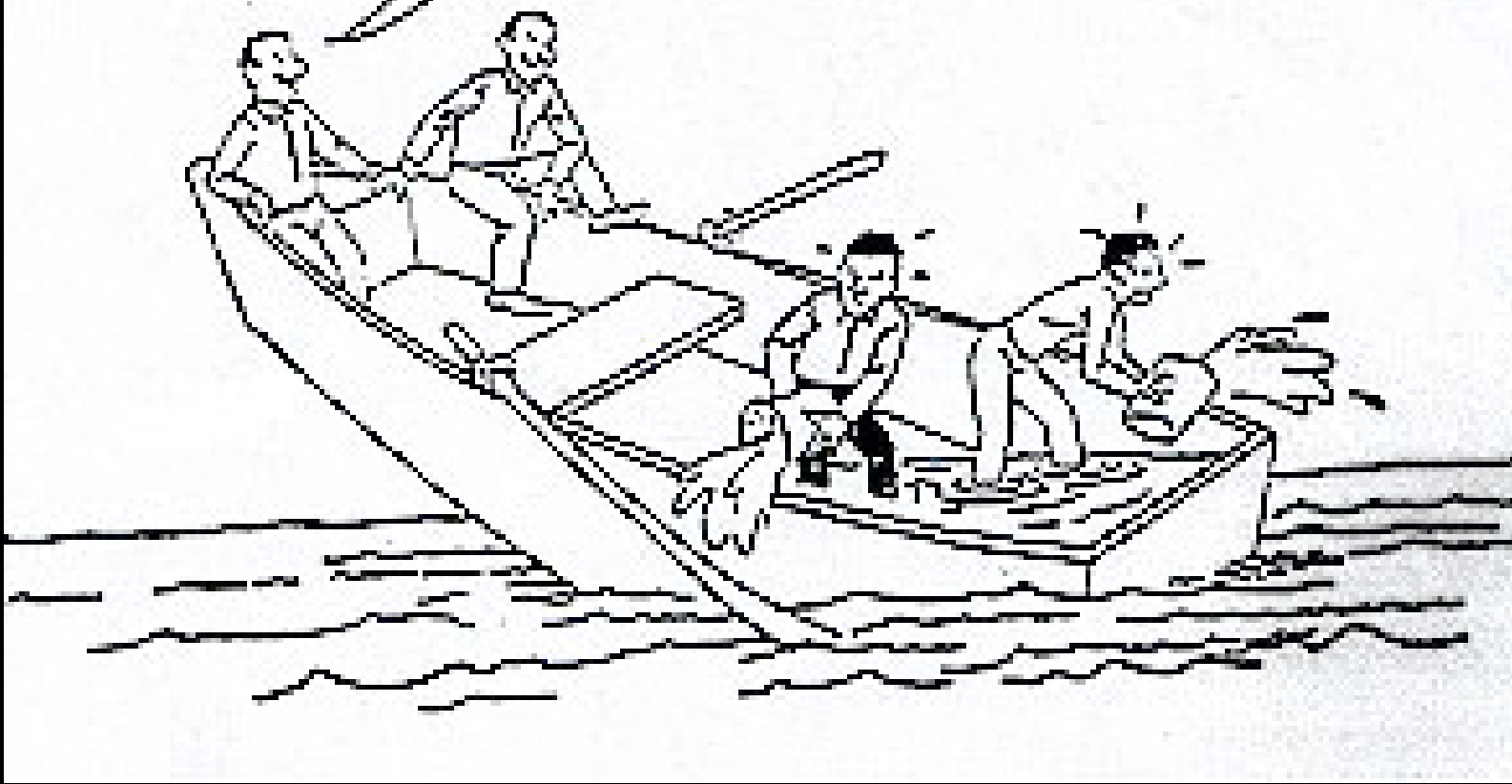
5 KEY SUCCESS FACTORS FOR SUSTAINABILITY INTEGRATION:

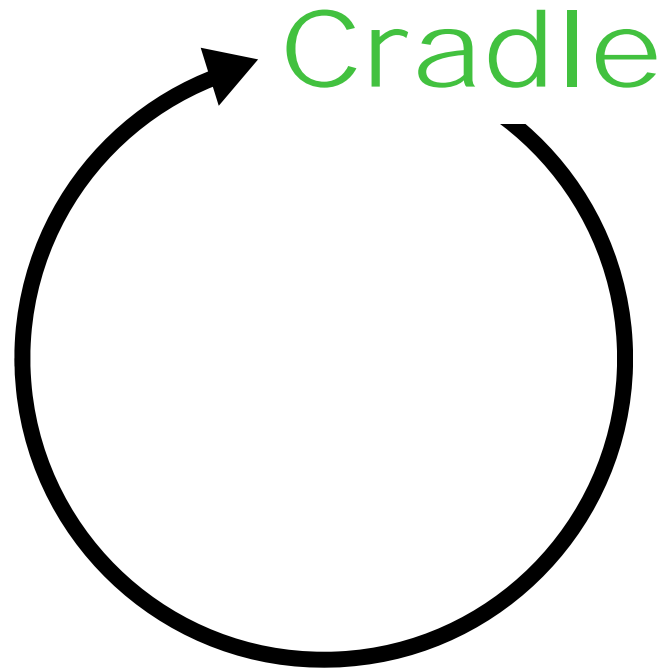
- 1. Support the mission**
-- know the business case
- 2. Be an effective agent of change**
- 3. Have a sustainability North Star -- a point of reckoning to keep you on track**
- 4. Use a sustainability planning model**
- 5. Use life cycle analysis**
-- think in systems and closed loops



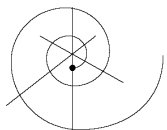


I'm sure glad the hole isn't in our end...





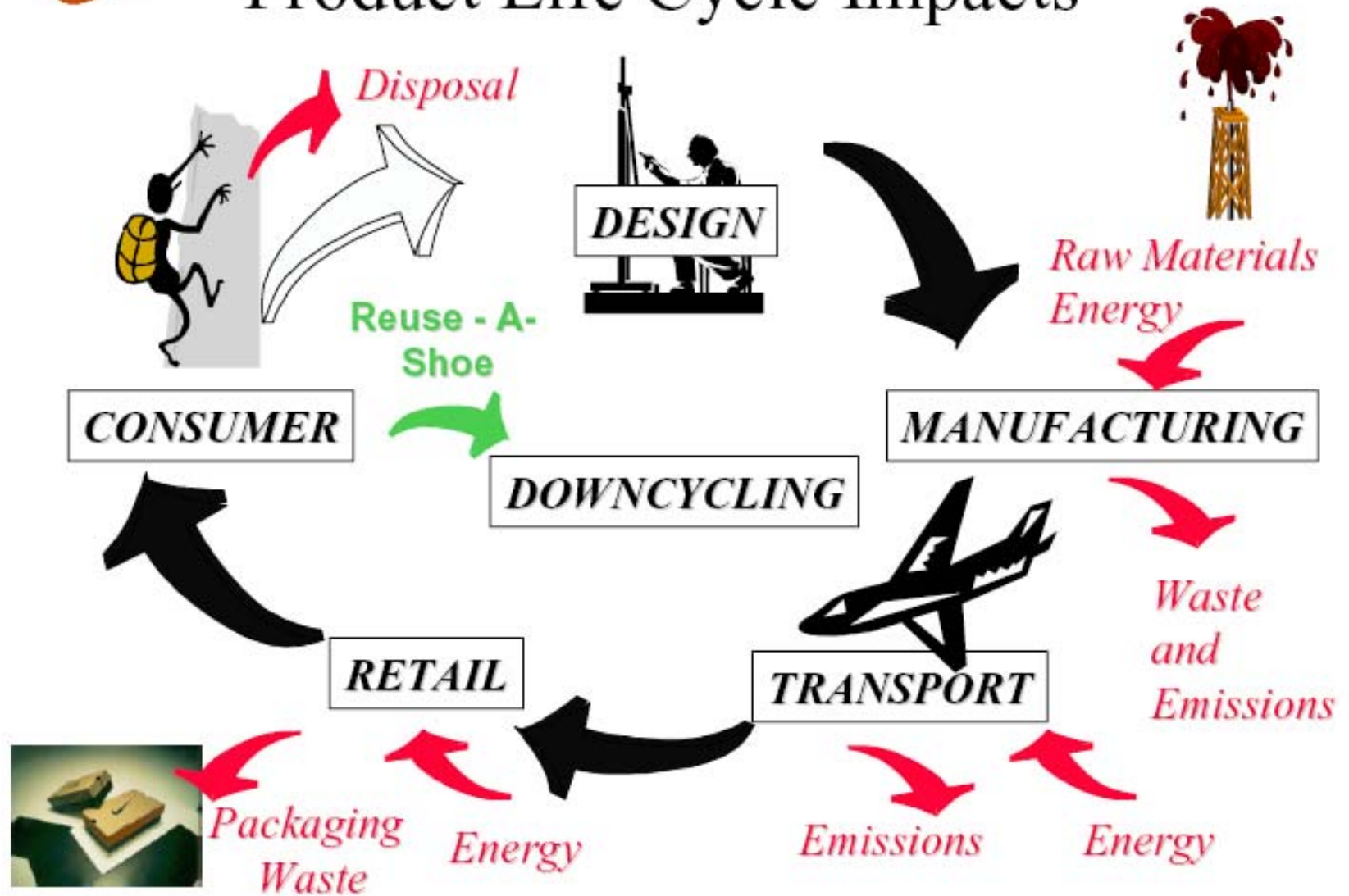
McDonoughBraungart



SUSTAINABILITY PARTNERS



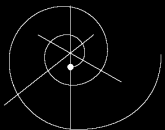
Product Life Cycle Impacts





BRIAN'S 5 KEY SUCCESS FACTORS FOR SUSTAINABILITY PRACTITIONERS:

- 1. Support the mission**
 - know the business case
- 2. Be an effective agent of change**
- 3. Use a sustainability planning model**
- 4. Understand core sust. principles**
 - simplicity without reduction
- 5. Use life cycle analysis**
 - think in systems, see connections

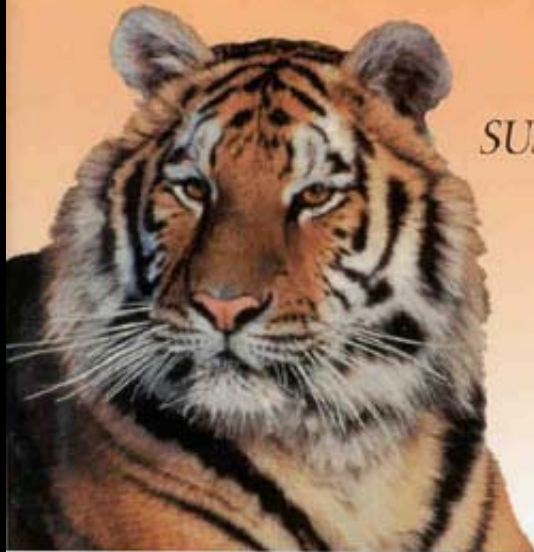




Foreword by Nicholas C. Sonntag

BRIAN NATTRASS & MARY ALTOMARE

Dancing *with the* TIGER



LEARNING
SUSTAINABILITY
STEP by
NATURAL
STEP

CONSCIENTIOUS COMMERCE

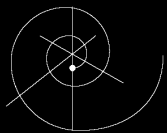
THE NATURAL STEP FOR BUSINESS

WEALTH, ECOLOGY AND
THE EVOLUTIONARY
CORPORATION

Brian Nattrass & Mary Altomare



FOREWORD BY
KARL-HENRIK ROBERT
EPILOGUE BY
PAUL HAWKEN



SUSTAINABILITY PARTNERS

A PLAN FOR A BRIGHT FUTURE BEYOND 2050

SCIENTIFIC AMERICAN

**SPECIAL
ISSUE**

SEPTEMBER 2005
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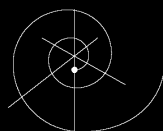
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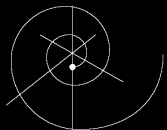


SUSTAINABILITY



***What is your personal
VISION?***

***What is your personal
COMMITMENT?***

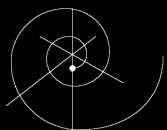




The Power of Absolute Commitment!

W. H. Murray in *The Scottish Himalaya Expedition*,
1951 (Often attributed to Goethe)

“Until one is committed, there is hesitancy, the chance to draw back, always ineffectiveness. Concerning all acts of initiative (and creation) there is one elementary truth, the ignorance of which kills countless ideas and splendid plans: that the moment one definitely commits oneself, then Providence moves too. All sorts of things occur to help one that would never otherwise have occurred. ...cont.

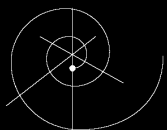


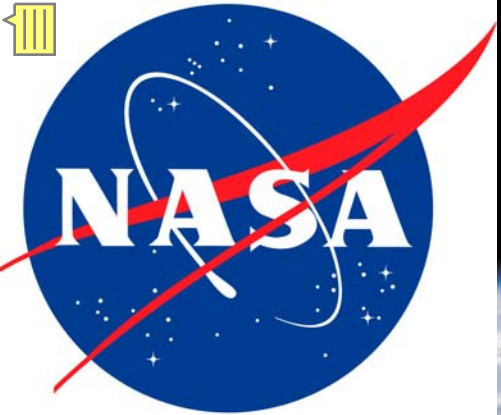


....A whole stream of events issues from the decision, raising in one's favor all manner of unforeseen incidents and meetings and material assistance, which no man could have dreamed would have come his way.

***Whatever you can do or dream you can, begin it.
Boldness has genius, power and magic in it.***

Begin it now."



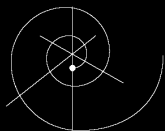


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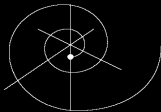
“Never doubt that a small, committed group of people can change the world. Indeed, it is the only thing that ever has.”

– Margaret Mead





shifthappens



SUSTAINABILITY PARTNERS