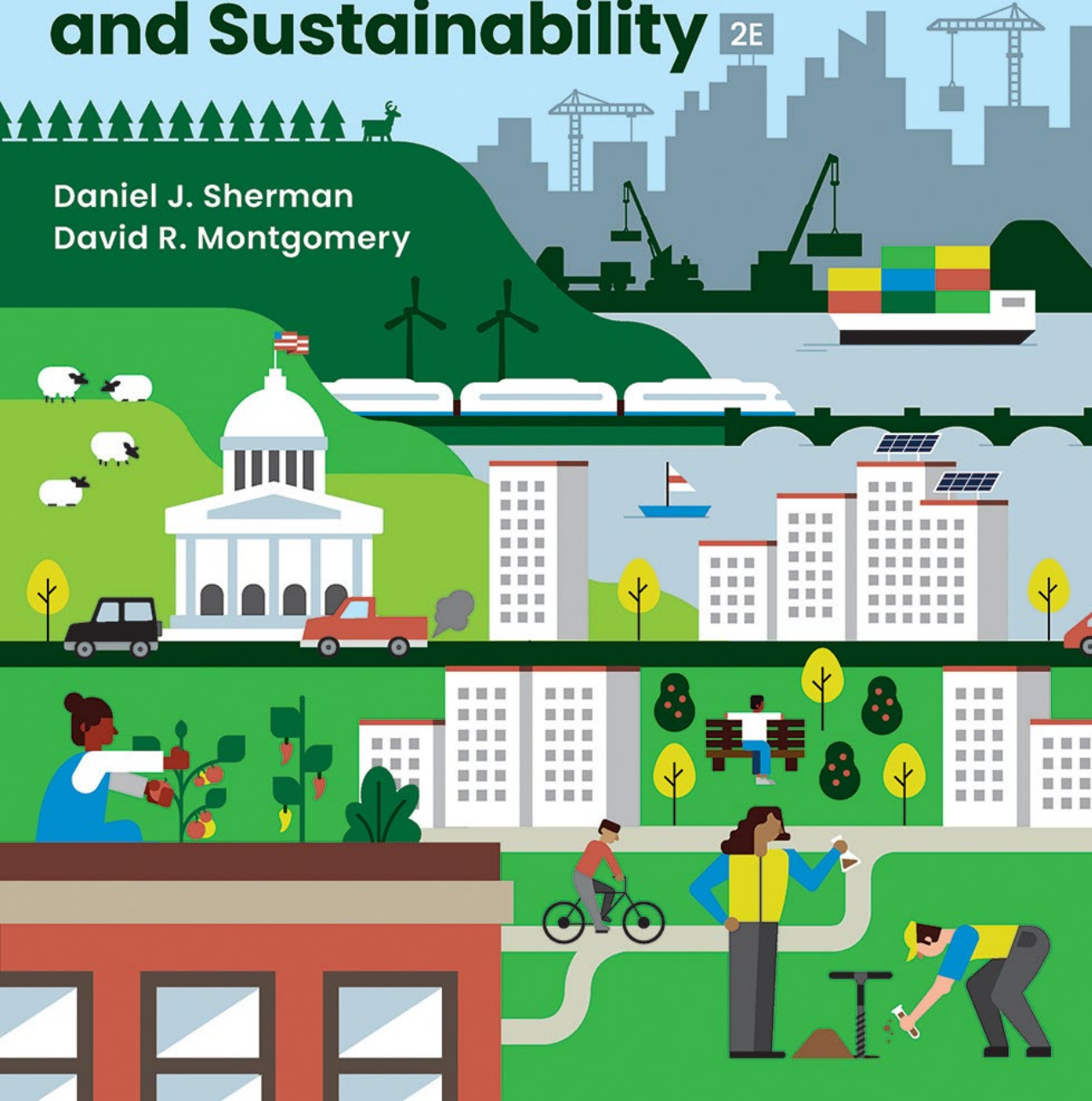


Environmental Science and Sustainability 2E

Daniel J. Sherman
David R. Montgomery



CHAPTER 18, 19 & 20

Decision Making: Why Do Our Choices Matter?

Groups and Organizations: How Do We Work Together for Sustainability?

Government: How Can Policy Influence Sustainability?

Keys to doing well in life & your career – 2025

Being...

- Critical/Systems Thinkers
- Resilient, adaptive
- Effective communicators
- Creative
- Socially engaged & empathetic
- Technologically skilled
- Sustainably minded – True cost accounts



Civilization

A dynamic society characterized through its advanced developments in art, culture, education, financial systems, government, and technological to industrial skills.



“Thinking is easy, acting difficult, and to put one’s thoughts into action, the most difficult thing in the world.” - Goethe

Systems, Energy and You

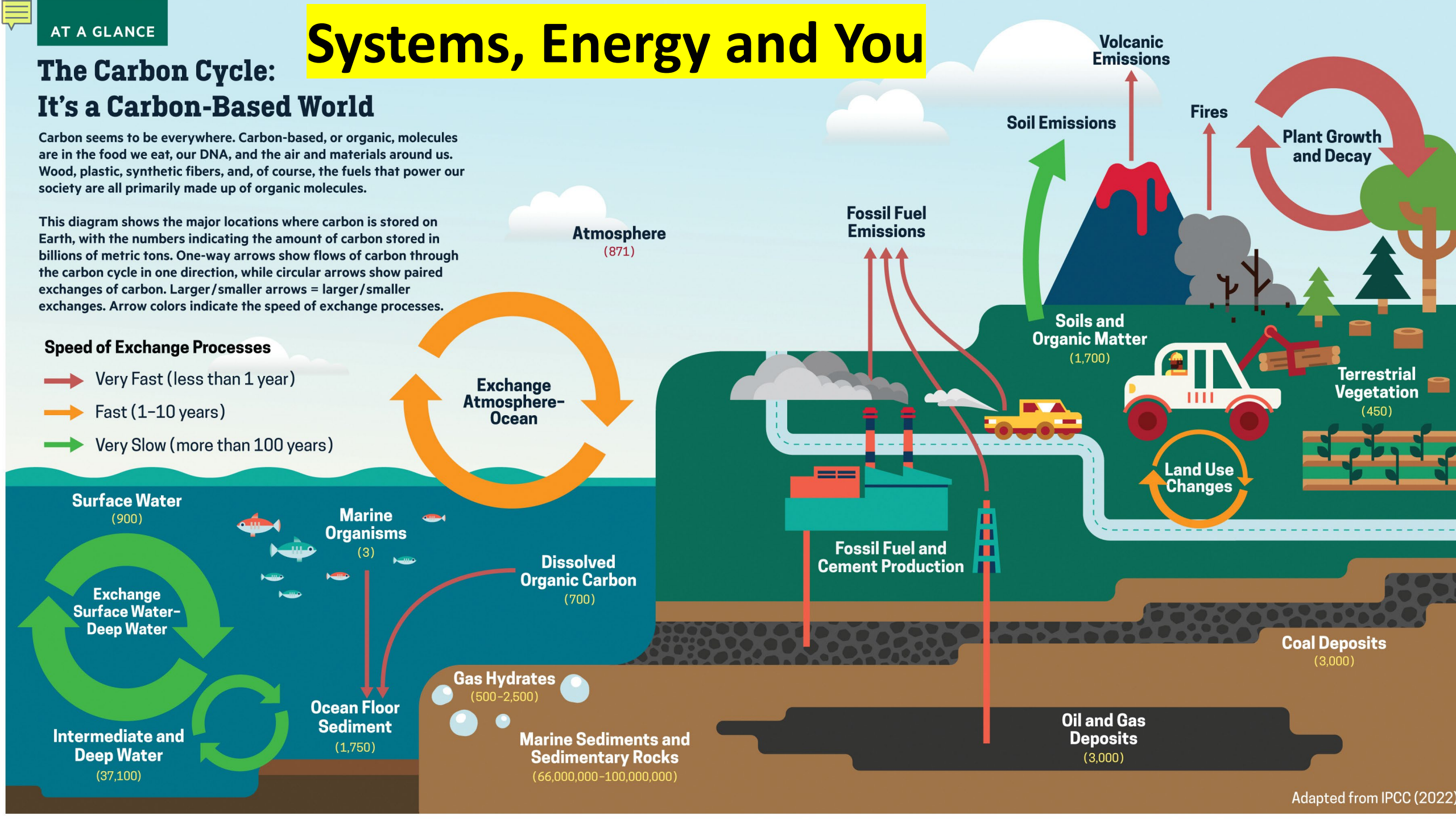
The Carbon Cycle: It's a Carbon-Based World

Carbon seems to be everywhere. Carbon-based, or organic, molecules are in the food we eat, our DNA, and the air and materials around us. Wood, plastic, synthetic fibers, and, of course, the fuels that power our society are all primarily made up of organic molecules.

This diagram shows the major locations where carbon is stored on Earth, with the numbers indicating the amount of carbon stored in billions of metric tons. One-way arrows show flows of carbon through the carbon cycle in one direction, while circular arrows show paired exchanges of carbon. Larger/smaller arrows = larger/smaller exchanges. Arrow colors indicate the speed of exchange processes.

Speed of Exchange Processes

- Very Fast (less than 1 year)
- Fast (1-10 years)
- Very Slow (more than 100 years)





Air



Water



Land



Life





Susanne Simard



4300



Roma

1200 years





1776 to ..? @ 249



2976

6076



The End of the Roman Empire Wasn't That Bad

By James Fallows

- U.S.A. vs. Rome
- Could the self paralysis of American national government somehow user in a rebirth – of our own Dark Ages?
- People are shifting their enthusiasm and careers to local and state efforts

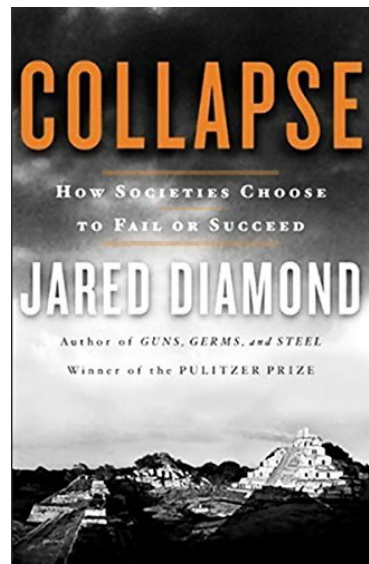




Astounding new beginnings are underway

Jared Diamond – Trends of *Collapse*

1. Environmental destruction
 - Inadvertently destroying the resource base your society depends on...
2. Climate change (warming or cooling)
3. Hostile neighbors (War- someone wants your resources and is willing to fight for them)
4. Once friendly neighbors choose not to support you
5. Political, social, culture factors



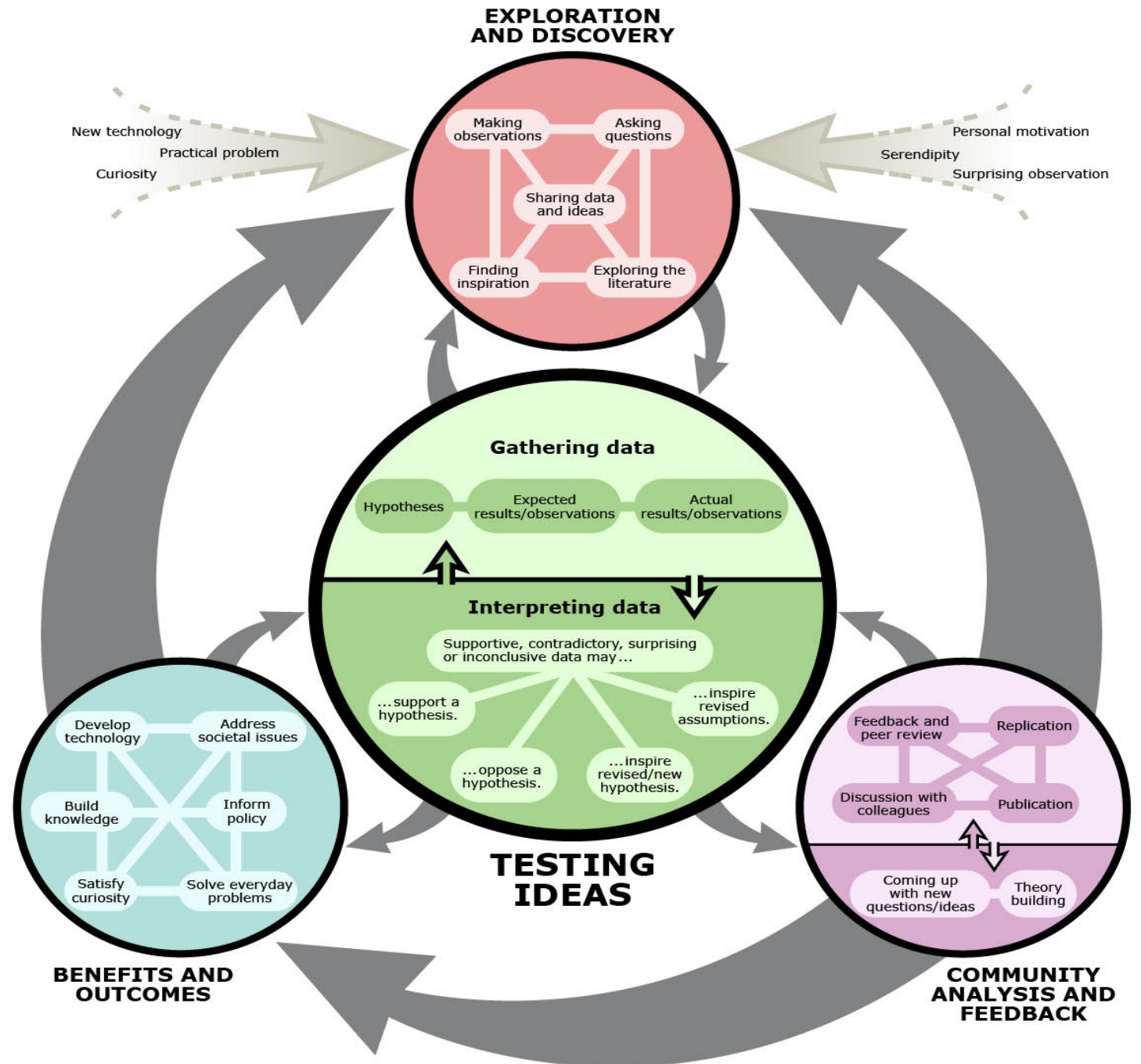
Societal reactions –

Observations – Critical Thinking – Decisions

1. Failure to perceive the problem
2. Recognize the problem but choose to do nothing about it
3. Recognize the problem work effectively together, but it is not enough

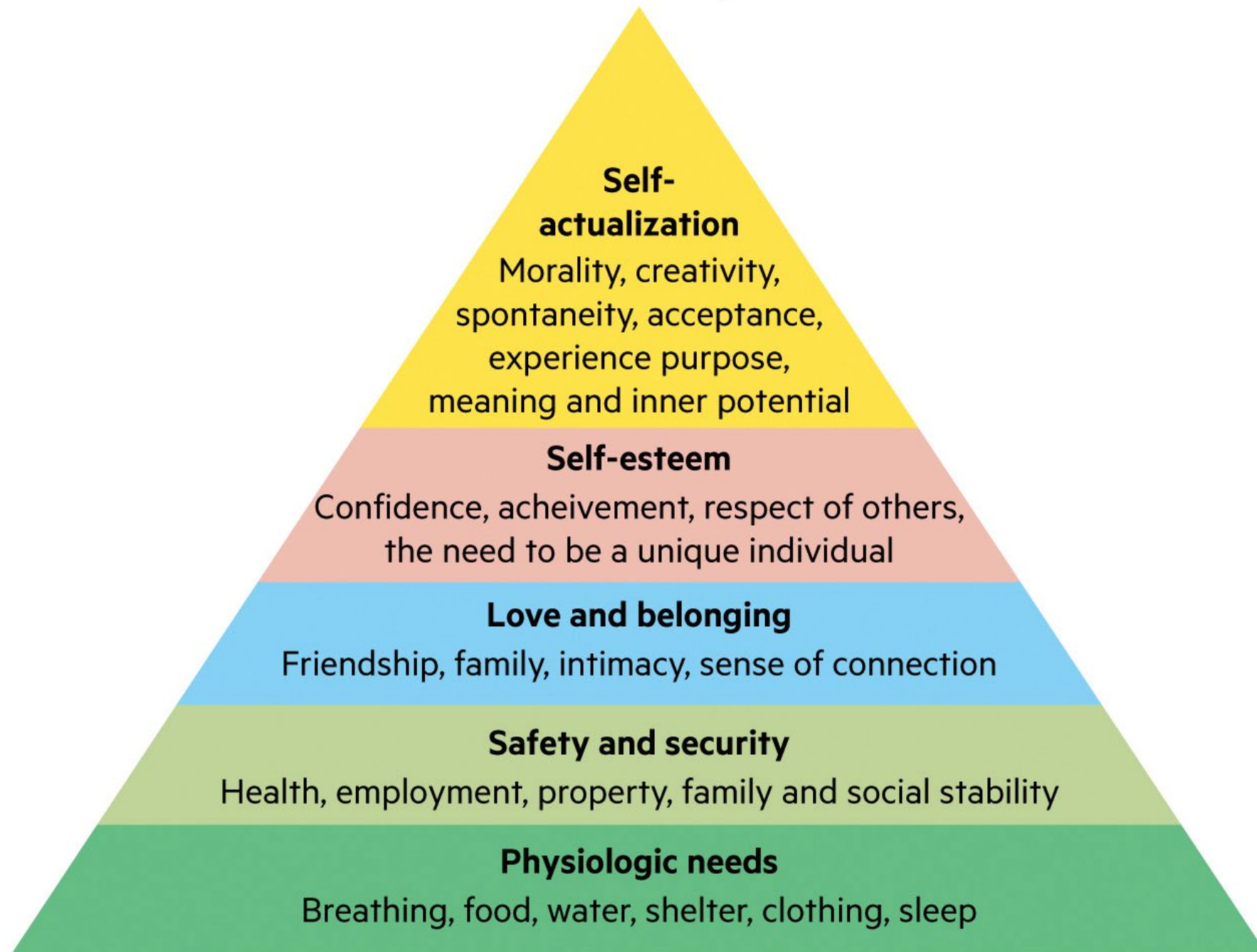
Do Our Choices Matter?

Scientific Method





Maslow's Hierarchy of Needs





SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY



2 ZERO HUNGER



3 GOOD HEALTH AND WELL-BEING



4 QUALITY EDUCATION



5 GENDER EQUALITY



6 CLEAN WATER AND SANITATION



7 AFFORDABLE AND CLEAN ENERGY



8 DECENT WORK AND ECONOMIC GROWTH



9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



10 REDUCED INEQUALITIES



13 CLIMATE ACTION



14 LIFE BELOW WATER



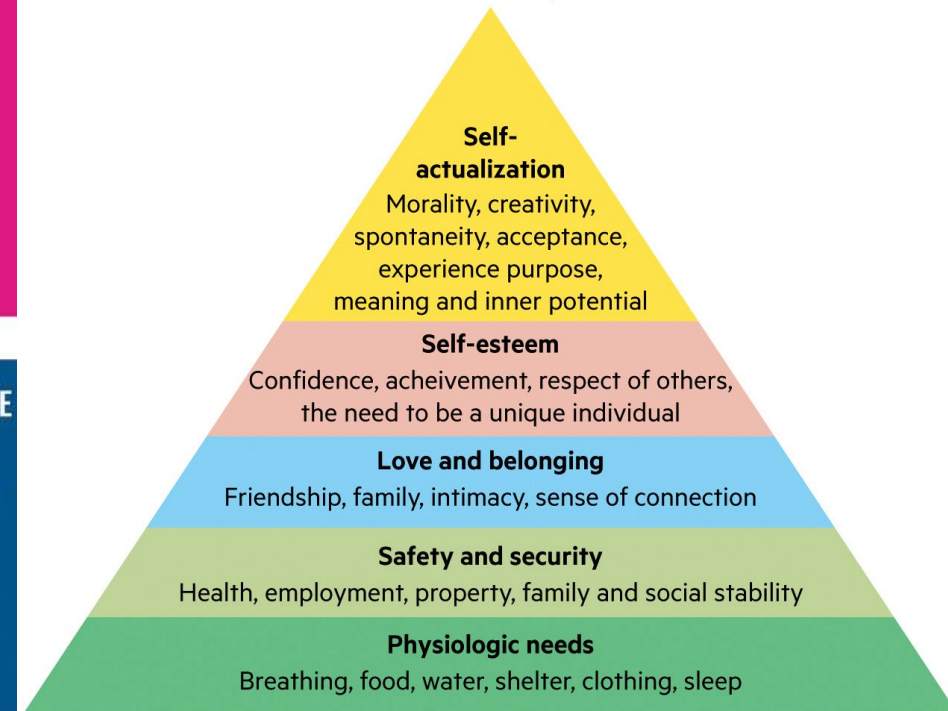
15 LIFE ON LAND



16 PEACE, JUSTICE AND STRONG INSTITUTIONS



Maslow's Hierarchy of Needs



Illegal ocean dumping

Medical waste washes up on shores and closes beaches in New York & New Jersey



Automatic thinking

$$2 + 10 = 12$$

- Status quo
- Loss averse

The Mug Experiment



1 Students are divided into two groups of "buyers" and "sellers." "Sellers" are given a coffee mug as a gift.



2 Sellers were willing to sell the mugs for a price much higher than the buyers were willing to pay.



3 This is an example of loss aversion. People appreciate things that they own more than things they do not.

Emotional Defense Mechanisms

- Distancing
- Resignation
- Delegation

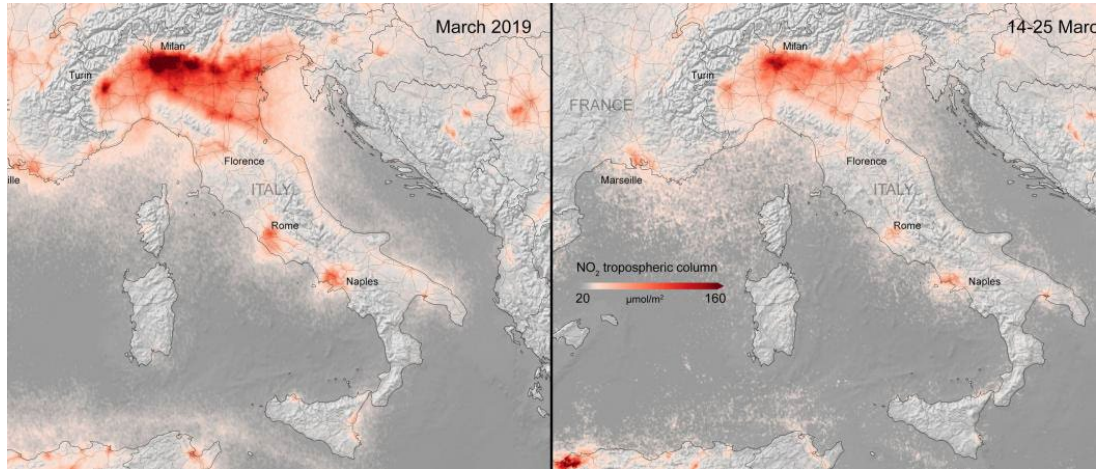


Yale Climate Connections, [Dana Nuccitelli](#), April 14, 2020

Patterns of Denial

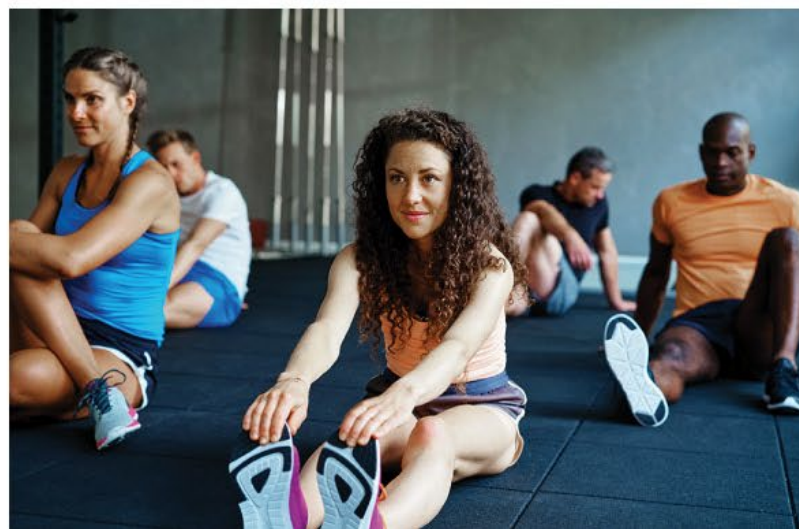
Stage 1 It's not happening	"The Democrats are politicizing the coronavirus ... This is their new hoax" [REDACTED]	"It's a hoax; I think the scientists are having a lot of fun." [REDACTED]
Stage 2 It's not our fault	"China is to blame because the culture where people eat bats and snakes and dogs and things like that, these viruses are transmitted from the animal to the people" - Sen. [REDACTED]	"China does not do anything to help climate change. They burn everything you could burn; they couldn't care less" - [REDACTED]
Stage 3 It's not that bad	"One day like a miracle it will disappear" - [REDACTED]	"[The climate] will change back." - [REDACTED]
Stage 4 Solutions are too costly	"We cannot let the cure be worse than the problem itself." - [REDACTED]	"I think the climate change is just a very, very expensive form of tax." - [REDACTED]
Stage 5 It's too late	"It is going to spread further and I must level with you ... many more families are going to lose loved ones before their time" - [REDACTED]	"The climate apocalypse is coming. To prepare for it, we need to admit that we can't prevent it." - Author [REDACTED]

Covid-19 and our Environment





oriko Cooper/Alamy Stock Photo



lamingo Images/Shutterstock



Shutterstock

Social Acceptance & Conformity



What do you believe?

- Belief perseverance
- Confirmation bias
- Pressure to conform/Peer pressure



Strategies for Influencing Behavior

Even when we are concerned and knowledgeable about an issue, it sometimes takes an extra nudge to get us to change our behavior. Here are some successful strategies that help us align our actions with our ideals.

STUDENT CENTER

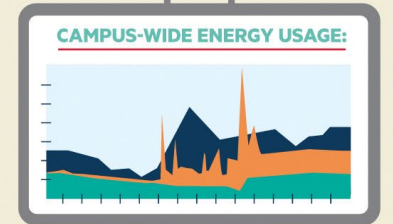
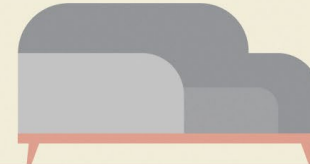
Commitments

Commitments elicit pledges from people to carry out certain behaviors, which increases the likelihood that they will follow through.



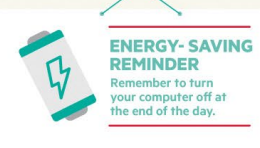
Feedback

Feedback provides information specific to the impact of a particular behavior.



Social Influence

Social influence can be used to encourage or discourage certain behaviors by making individuals aware that other people around them are behaving in a certain way.



Prompts

Prompts can be signs or physical reminders that call a person's attention to a desired behavior at the moment the person is deciding how to act.

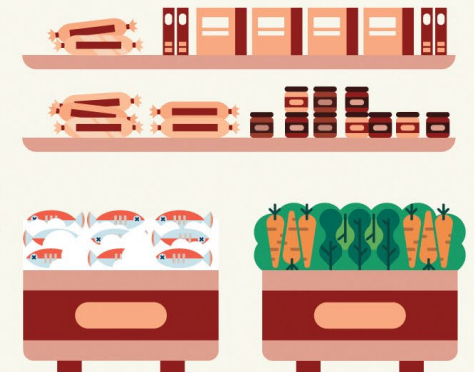
Incentives

Incentives are positive or negative signals that influence our behaviors.



Labels and Guides

Labels and guides can help consumers compare the environmental impacts of various products.



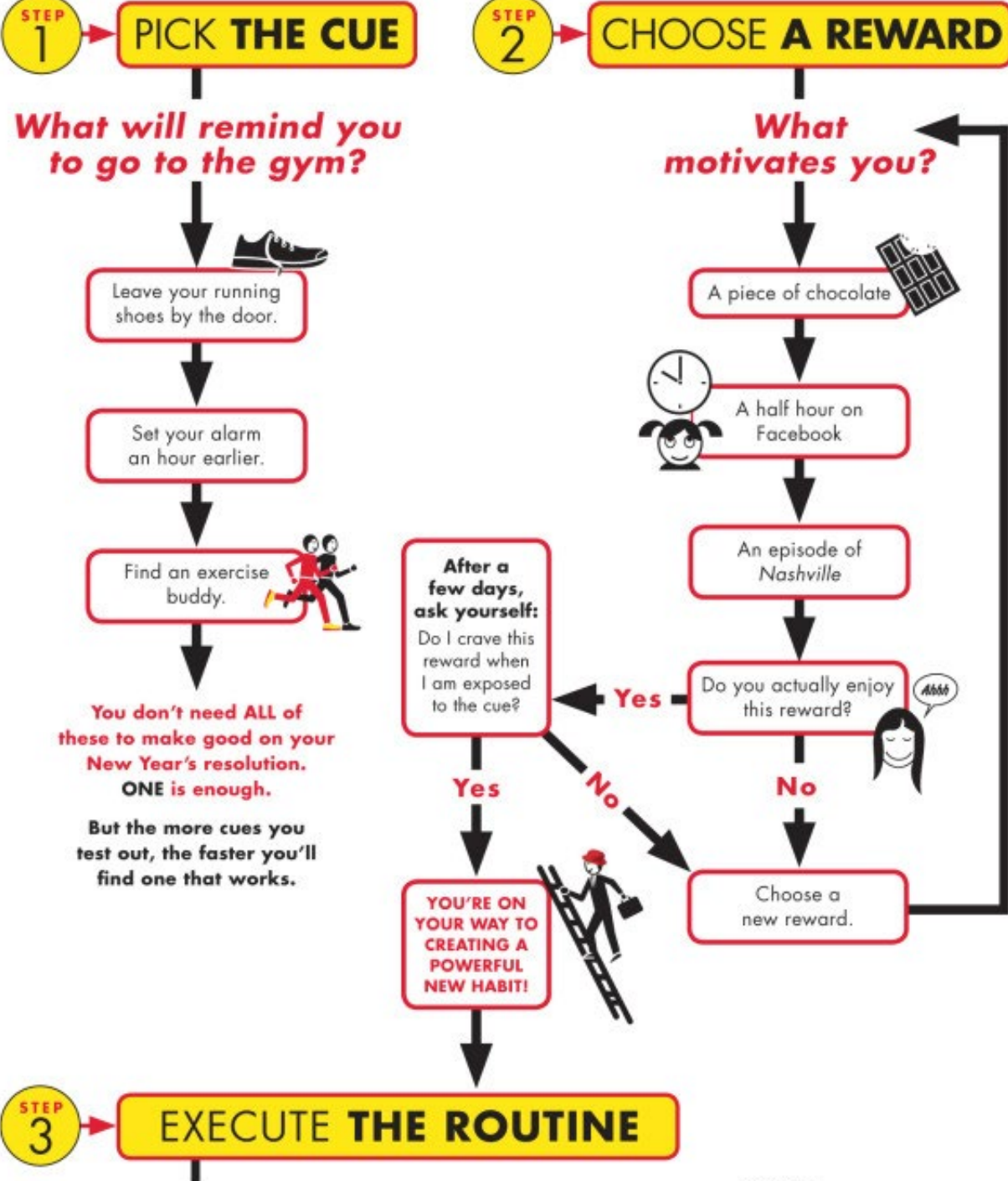
Influencing behavior

- Prompts
- Feedbacks
- Commitments
- Incentives
- Rules, Regulations, Laws

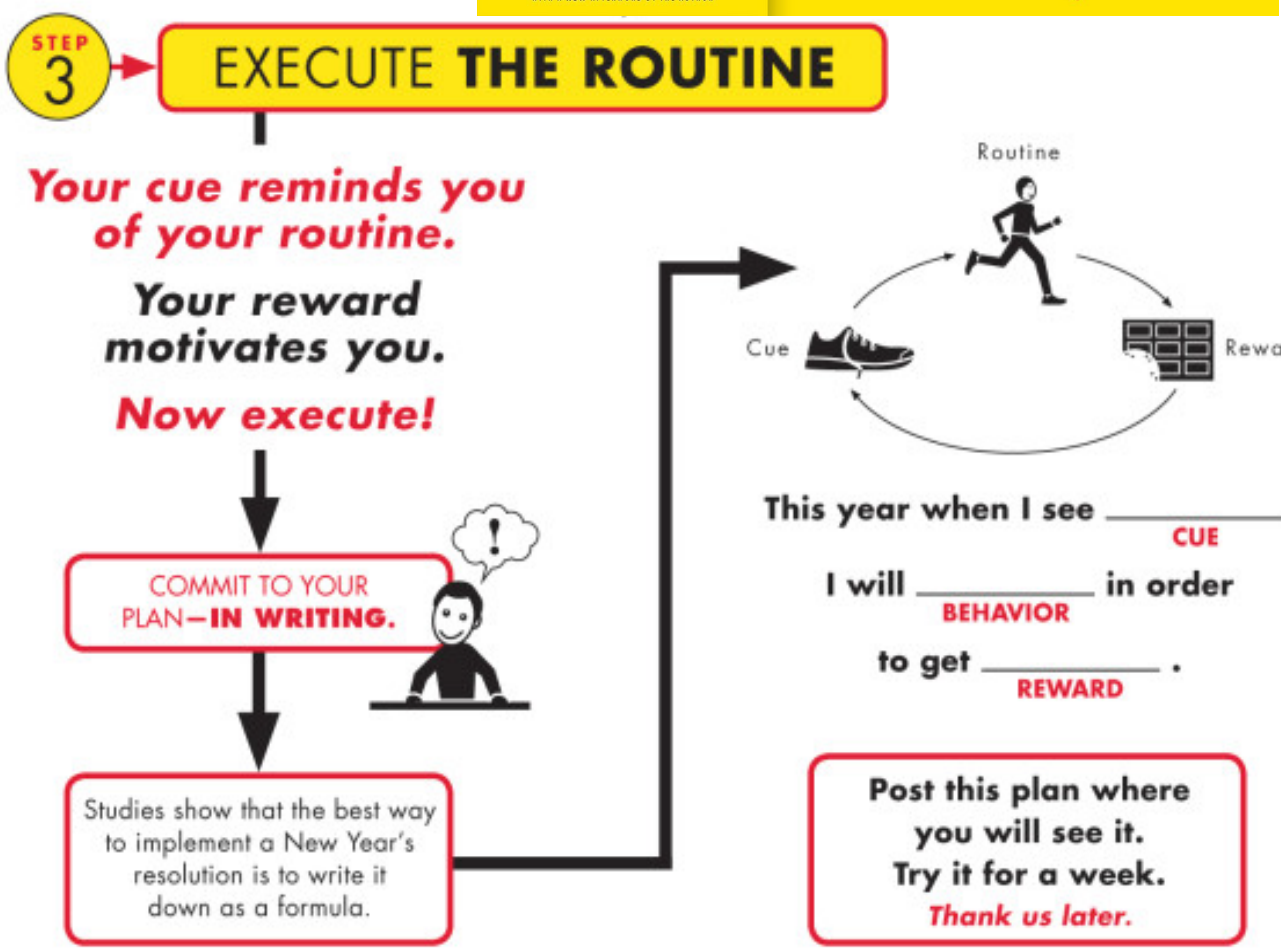
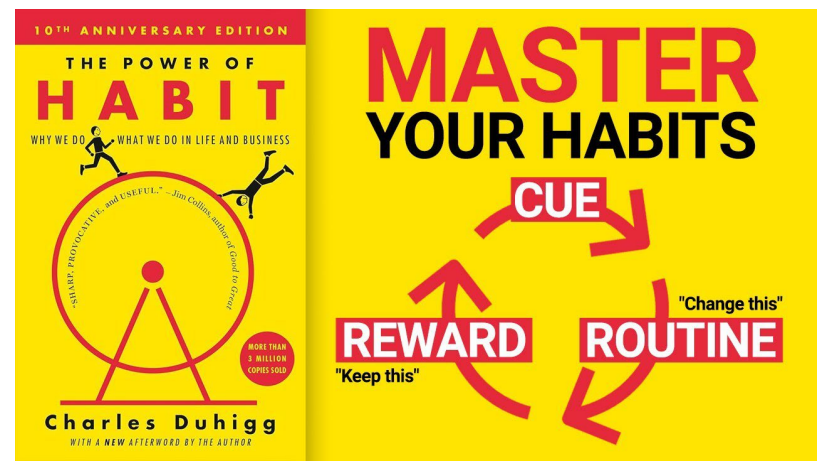
24 centimeters
(9.45 inches)

21 centimeters
(8.27 inches)





Habits



Importance of words

- Frames

A mental short-cut that uses word associations and images to help people quickly apply meaning to new information.



Jim Thompson/ZUMA Wire/Alamy Stock Photo



Jim West/Alamy Stock Photo



Iceland



Plan B
BURGER

Robin Wall Kimmerer

- Grammar of animacy
- Ki (singular), Kin (plural)



Labels



Gefahr: Flüssigkeit und Dampf leicht entzündbar. Schläfrigkeit und Benommenheit verursachen. Fernhalten. Nicht rauchen. Schutzhandschuhe/Schutzkleidung tragen. KONTAKT MIT DER HAUT (oder dem Haar): Abziehen. Haut mit Wasser abwaschen/duschen. In einer Position ruhigstellen, die das Atmen erleichtert. Bei Unwohlsein oder Arzt anrufen. Behälter dicht verschlossen aufbewahren.

Danger: Highly flammable liquid and vapour. Causes dizziness. Keep away from heat/sparks/open flames. Wear gloves/protective clothing/eye protection/face protection. Immediately all contaminated clothing. Rinse skin with fresh air and keep at rest in a position comfortable for breathing. Call doctor/physician if you feel unwell. Store in a well-ventilated area.

Danger: Liquide et vapeurs très inflammables. Provoque la somnolence ou vertiges. Tenir à l'écart de la chaleur. - Ne pas fumer. Porter des gants de protection des yeux/du visage. EN CAS DE CONTAMINATION, immédiatement les vêtements contaminés. Rincer la peau avec de l'eau fraîche. Transporter la victime à l'extérieur et la faire respirer confortablement. Appeler un CENTRE ANTOI-NE. Stocker dans un endroit bien ventilé. Mettre à l'abri de la chaleur.

Gevaar: Licht ontvlambare vloeistof en damp. Schuifduizeligheid veroorzaken. Vermijden van open vuur, roken. Beschermende handschoenen dragen. Bij contact met de huid: afspülen met water. Bij ongemak of bij ziekte: naar een arts of apotheker gaan. Opslaan op een goed geventileerde plaats. Buiten de bereik van kinderen.

slowly



1992



2017

Killing Energy Star: A Popular Program Lands on the Trump Hit List

2018 – Over 1000 US companies sign a petition urging the US government to keep the program



Labels

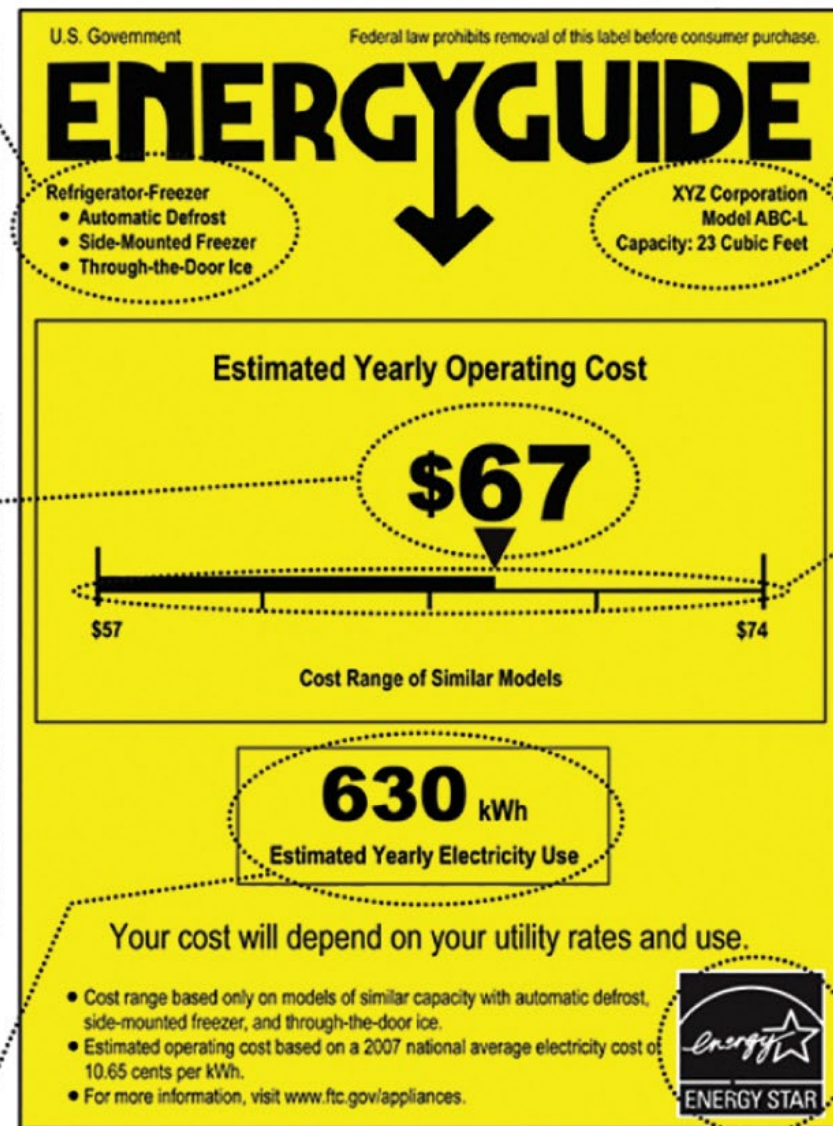


Guides

Lists key features of the appliance you're looking at and the similar models that make up the cost range below.

What you might pay to run the appliance for a year, based on its electricity use and the national average cost of energy. The cost appears on labels for all models and brands, so you can **compare** energy use just like you would price or other features.

An estimate of how much electricity the appliance uses in a year based on typical use. Multiply this by your local electricity rate on your utility bill to better judge what your actual operating cost might be.



The maker, model, and size tell you exactly what product this label describes.

The cost range helps you compare the energy use of different models by showing you the range of operating costs for models with similar features.

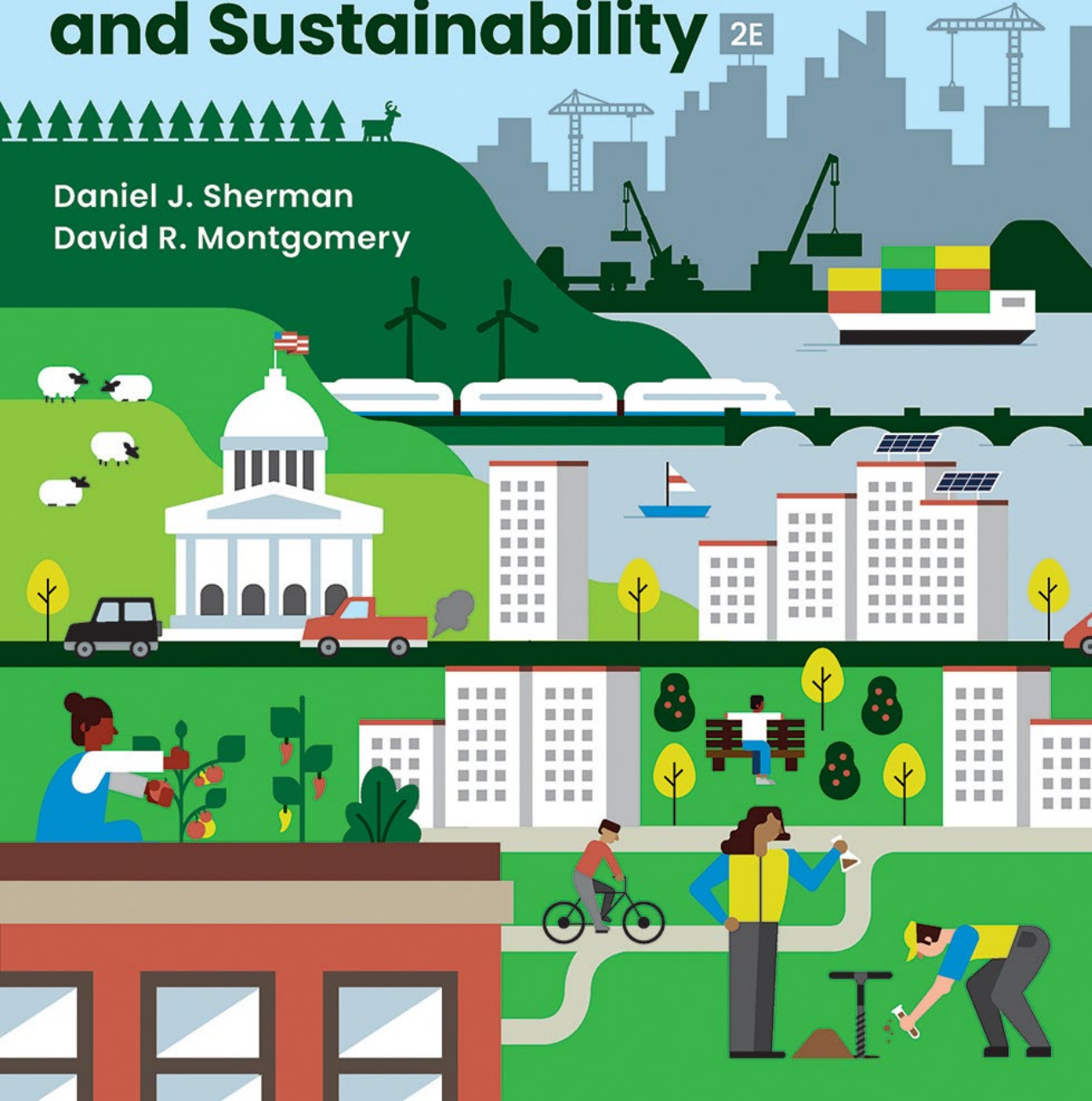
If you see the ENERGY STAR logo, it means the product is better for the environment because it uses less energy than standard models.

Science Communication



Environmental Science and Sustainability 2E

Daniel J. Sherman
David R. Montgomery



CHAPTER 19 Groups and Organizations

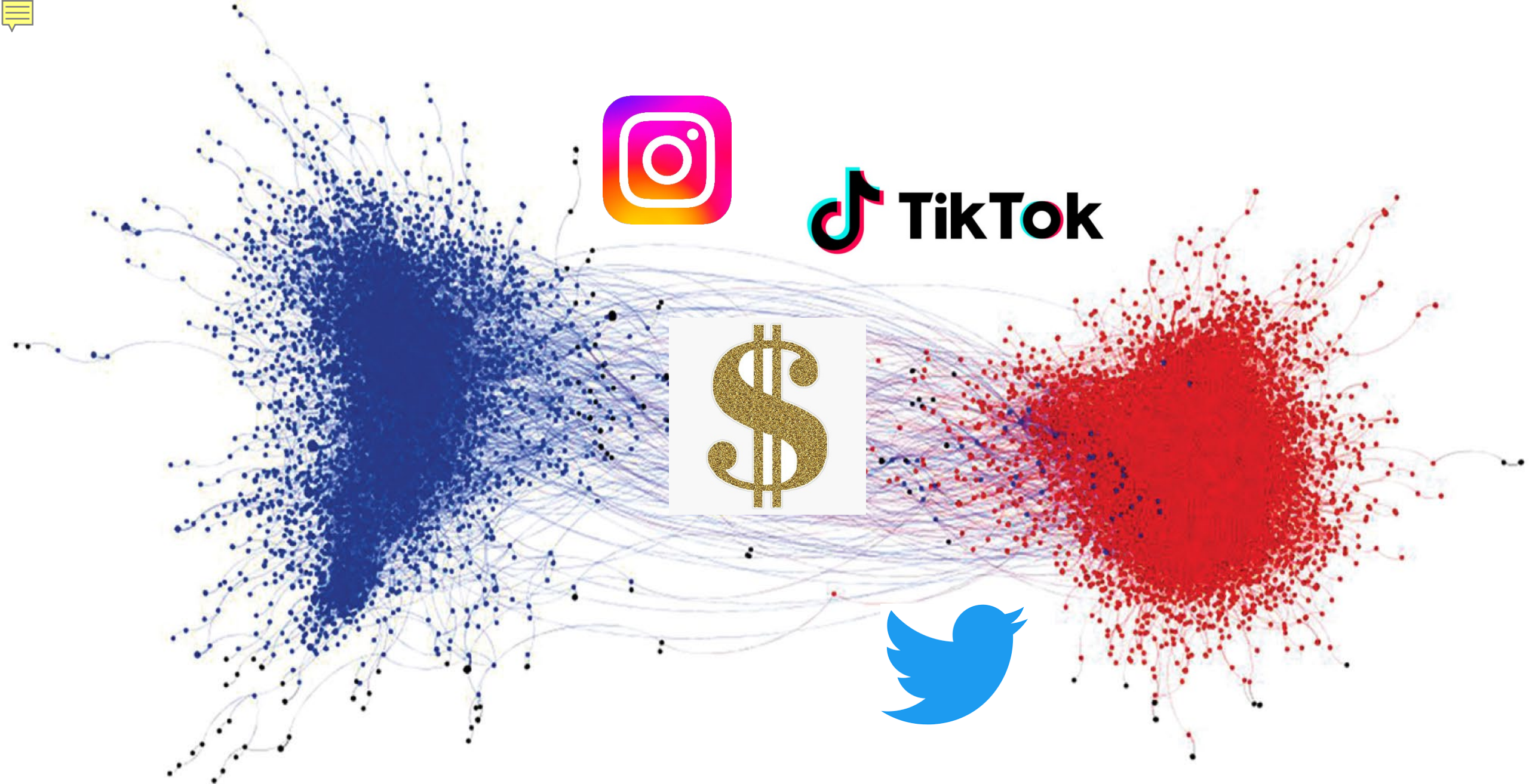
How Do We Work Together for Sustainability?

Many ideas are more easily changed by aiming at a group than by aiming at an individual.
- Josephine Klein

Our Connections

- Social groups
- Organizations
- Networks





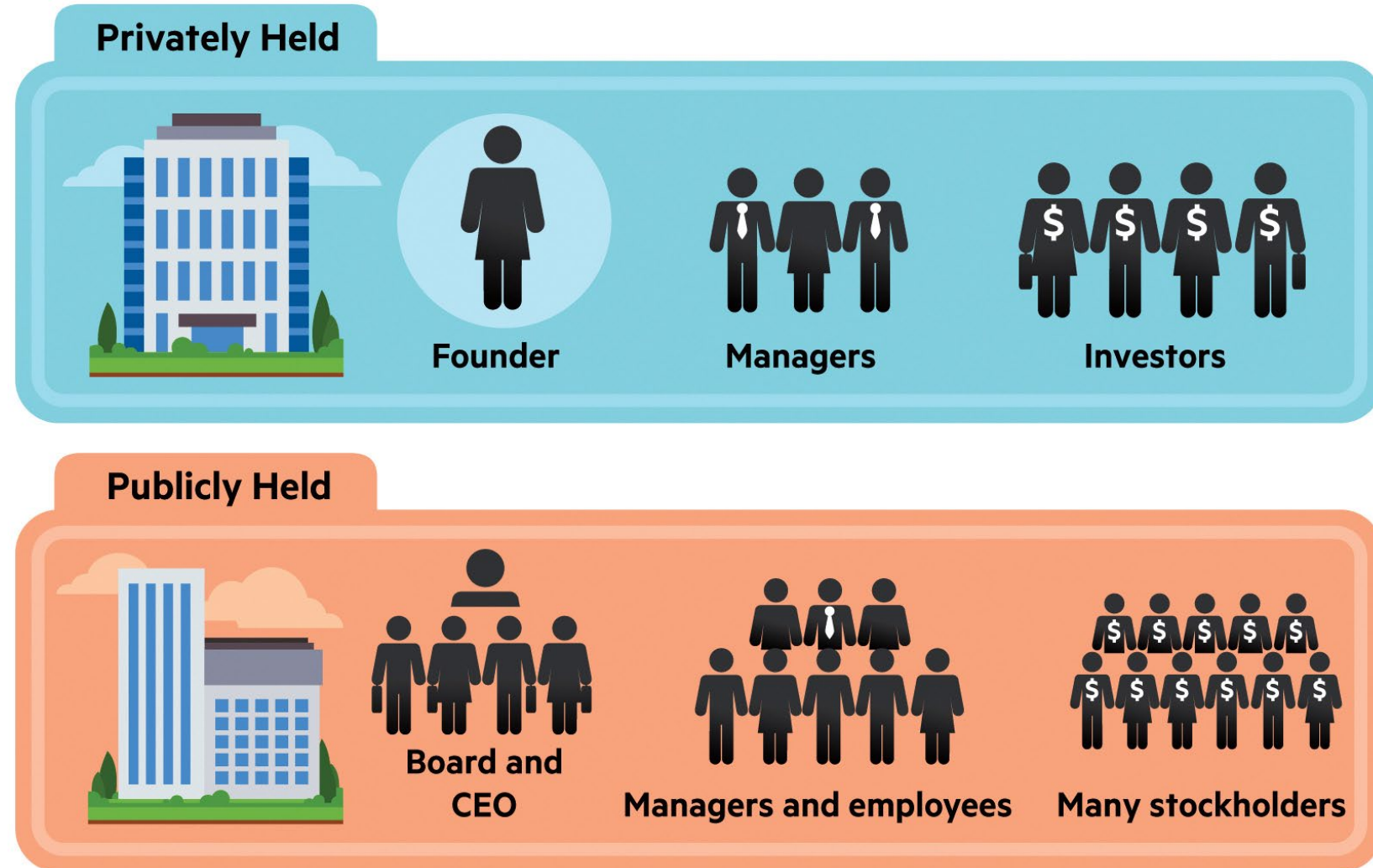


Influencers



Organizations & Change

- Businesses
 - For-Profit
 - Non-Profit



5 EXAMPLES OF GREENWASHING

1. Misleading Labels



2. Misleading Packaging



3. Distracting Information



4. Publicity Stunts

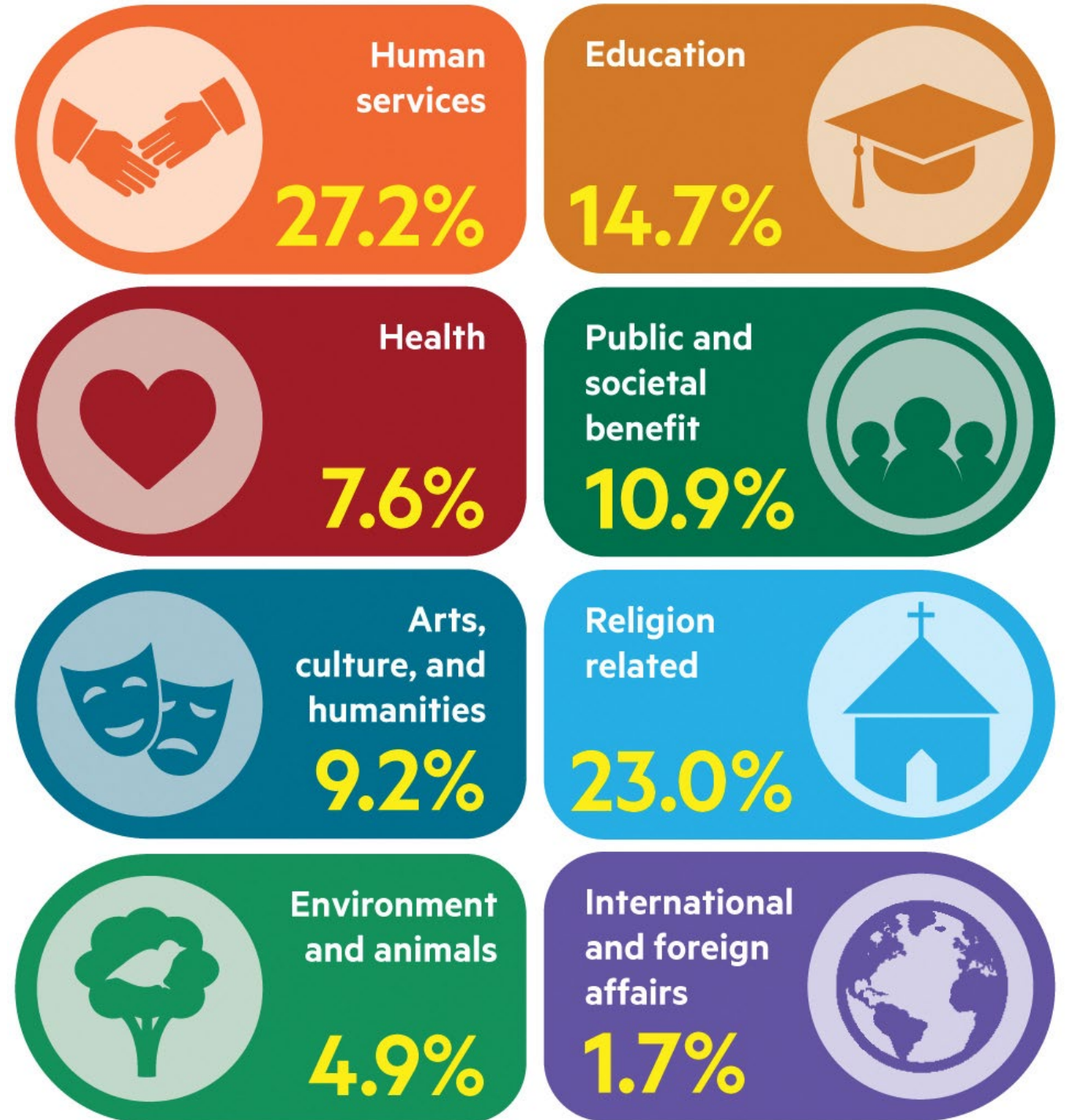


5. No Transparency





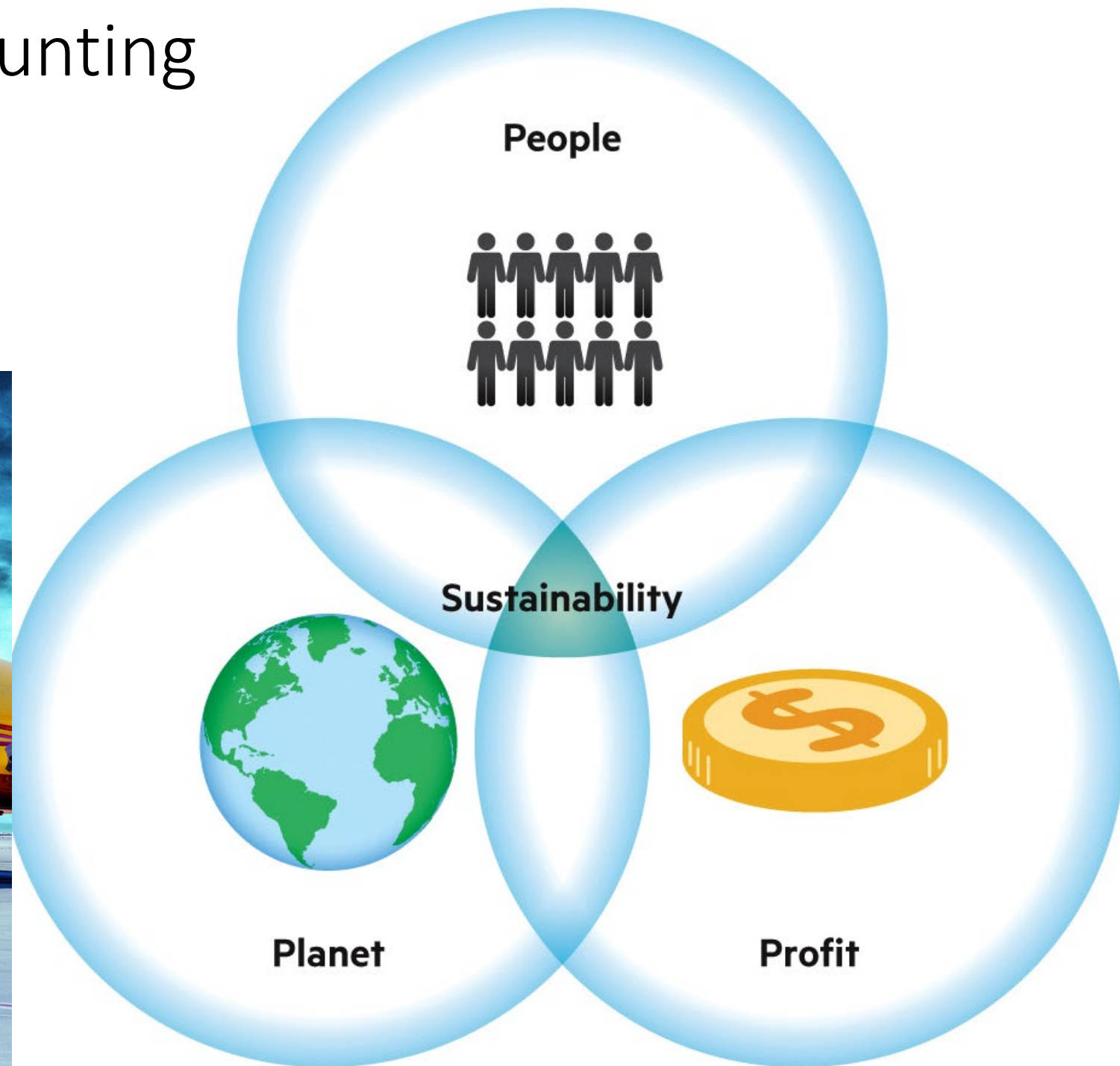
Non-Profits



Artists in Residence Programs



Triple Bottom Line Accounting



Mission & Strategy statements UNI –

- Vision: We serve the public good through excellence in teaching and learning, scholarship, and service.
- Mission: The University of Northern Iowa creates, empowers, and innovates to enrich Iowa and beyond.

- Our Values
 - Academic Freedom: The freedom of inquiry and expression in teaching and learning, scholarship, and service.
 - Access: A welcoming, supportive and affordable educational environment for all.
 - Integrity: A commitment to accountability, responsibility, and the highest ethical standards are integrated into all university practices.
 - Collaboration: A commitment to work together to achieve our shared vision, mission and goals, and to develop and improve institutional policies, programs, and processes.
 - Community: A caring and safe community characterized by appreciation, respect, and a sense of belonging for all.
 - Empowerment: Active engagement in transformative, innovative and lifelong learning in service to the public good.
 - Excellence: A commitment to pursuing the highest levels of achievement in teaching and learning, scholarship and service.
- Sustainability: A resilient community and campus that balances innovation and stewardship, is economically sound, and environmentally responsible.

Driven by consumer and employee demand peer pressure

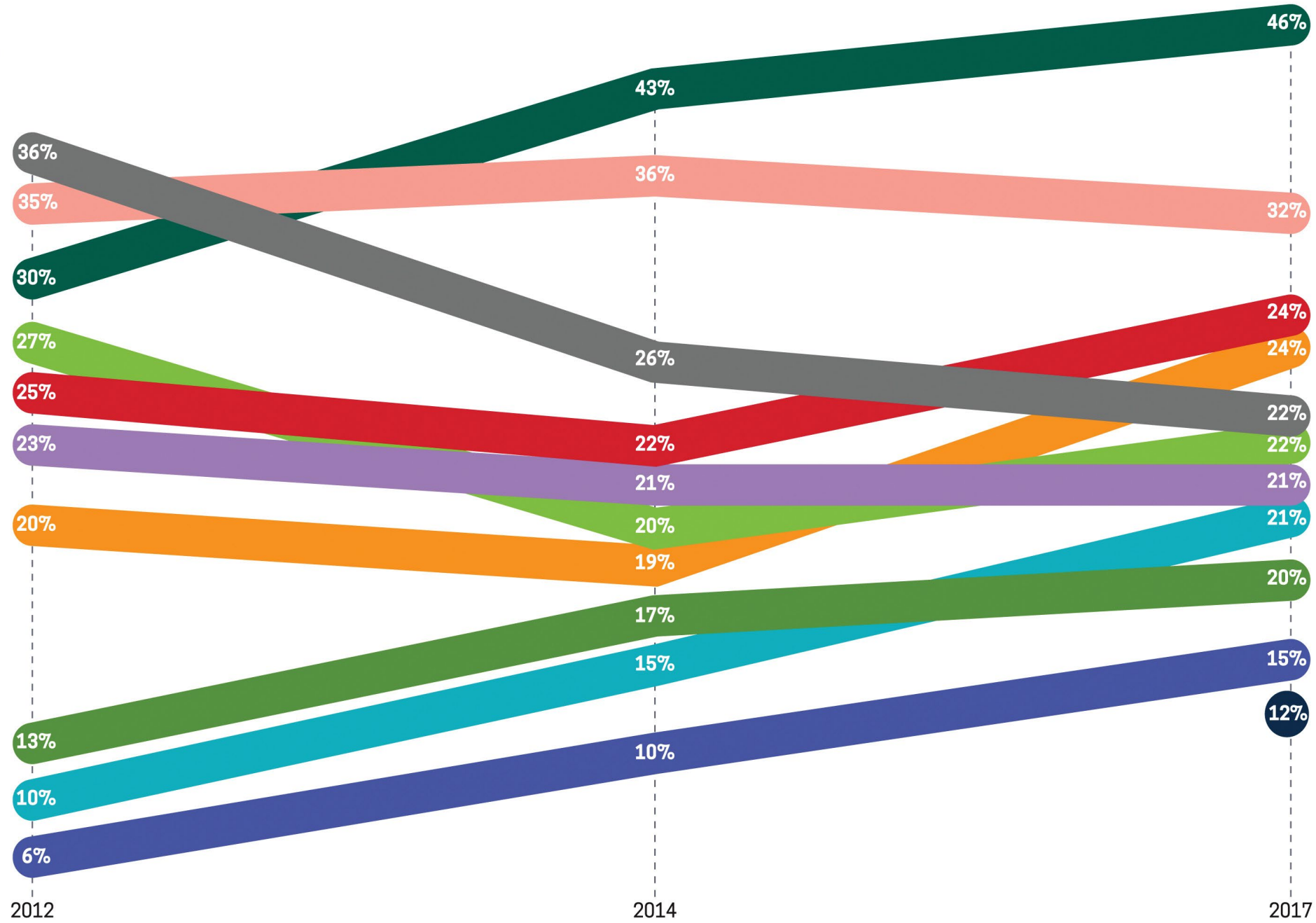
Why Are Organizations Addressing Sustainability?

The global consulting firm McKinsey & Company regularly surveys global executives on the most significant issues they face. One of these issues is implementing sustainability programs in their businesses. These surveys show that the importance of this goal is growing, driven by the opinions of their customers and employees.

Top reasons why organizations are addressing sustainability topics

(by percentage of respondents)

- Improve operational efficiency
- Build, maintain, or improve reputation
- Align with our goals, mission, or values
- Respond to regulatory requirements
- Develop new growth opportunities
- Ensure our ability to grow
*in 2012 and 2014 this was phrased differently:
"Strengthen competitive positioning"
- Meet consumers' expectations
- Make tangible, positive impact
- Attract, motivate, or retain employees
- Meet industry norms or standards
- Meet investors' expectations
*this was not offered as an answer choice in 2012 or 2014



Margert Mead

"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has."



What Can I do?

- Examine your sphere of influence
- Get involved at UNI.
- Many hand make light work.
- Connect with other campuses
- Figure out what financial factors drive business decisions

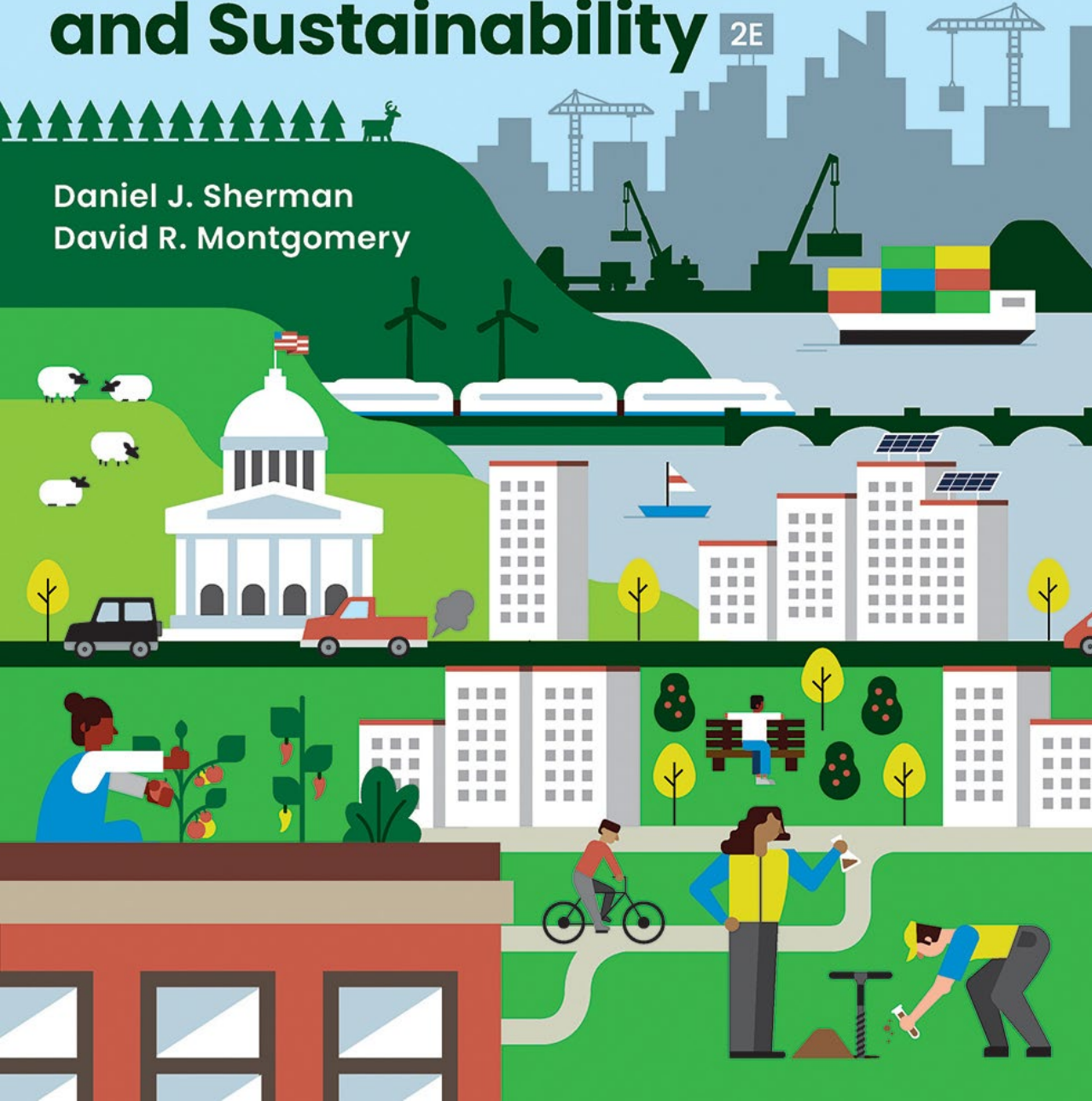


Upper
Midwest
Association
for Campus
Sustainability



Environmental Science and Sustainability 2E

Daniel J. Sherman
David R. Montgomery



CHAPTER 20 Government:

How Can Policy Influence Sustainability?

The federal government helps to fund highways and public transportation and regulates fuels and vehicles.

Federal

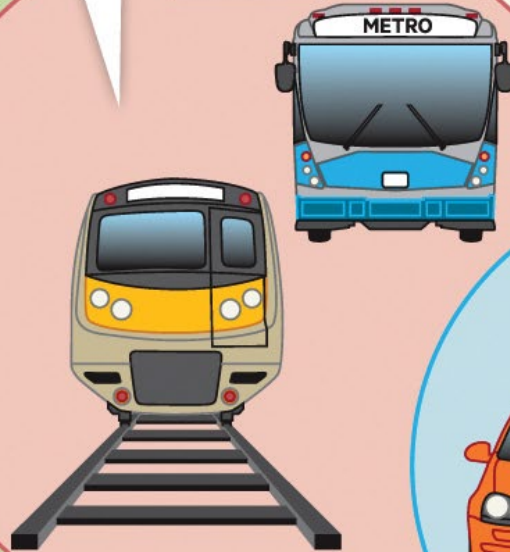


State departments of transportation fund, build, and maintain highways.

State

Regional government authorities often govern public transportation options such as light rail and buses.

Regional



Local governments such as cities and counties plan, build, and maintain streets, sidewalks, and bike paths.

Local



Opportunities to Influence Policy Making

We all have the right to make our voices heard and influence the policies made for our communities. There are many ways to become involved in policy making at local, regional, and national levels.



Voting

Voting matters. If you don't vote, your voice is not



Running for Office

Become a decision maker yourself by running for elected office or being appointed to a board, commission, or task force.



Campaigning

Campaign for a candidate you support. Think of it as multiplying your vote by influencing others.



Challenging Decisions in Court

Policy decisions are often challenged in court by ordinary citizens like you. For example, a group of children and teens is challenging the US government's lack of climate change policy in the lawsuit *Juliana v. United States*.



Donating/Contributing

Make a monetary contribution. Campaigns cost money and candidates rely on small donors as well as large ones.



Lobbying

Write letters to, call, and lobby your representatives directly on issues you care about.



Speaking at a Public Hearing

Many environmental decisions require public input. Speak up at public hearings and comment on proposed decisions.

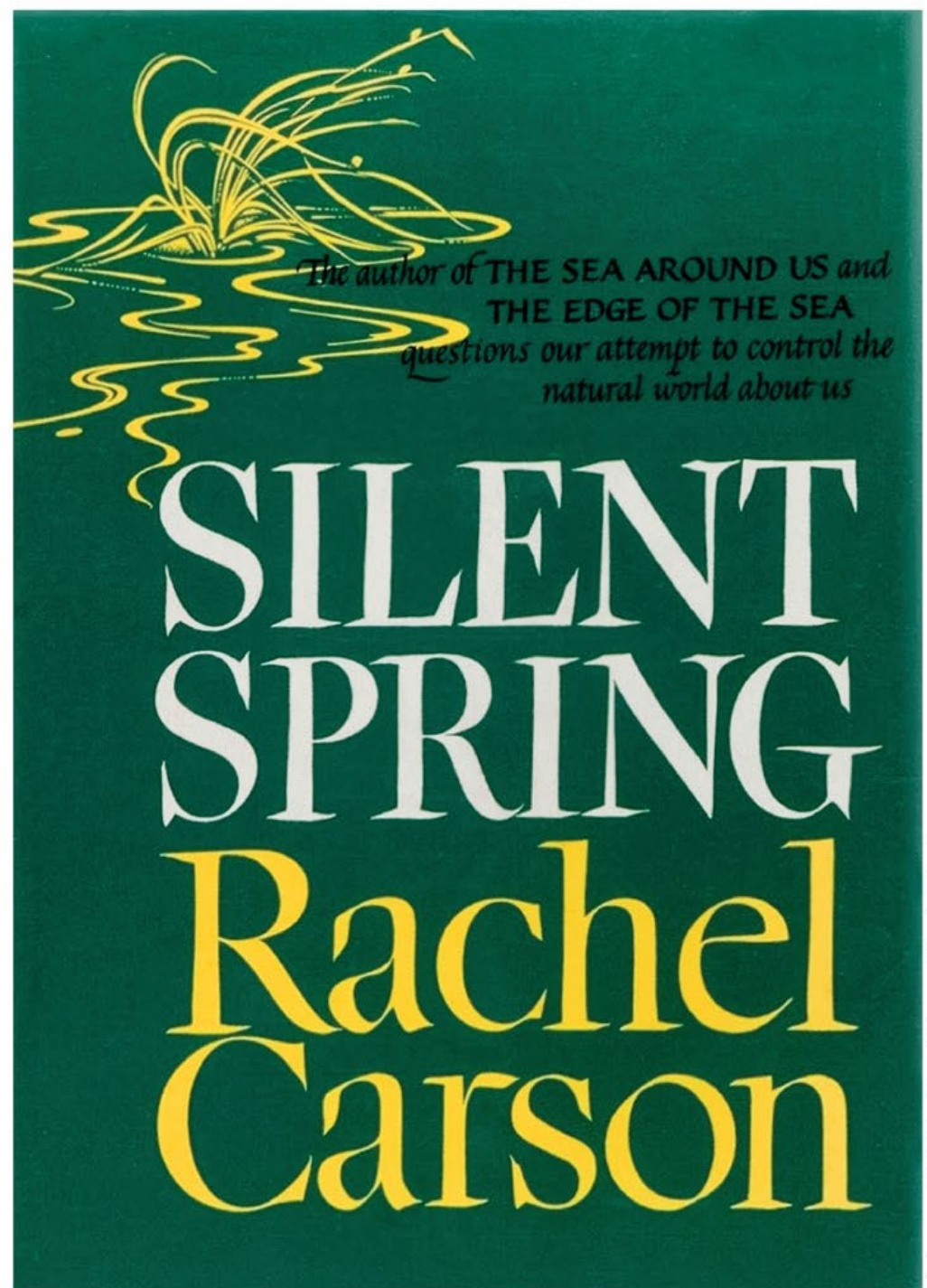


Protesting

Protests and other public demonstrations draw attention to issues.



Science History Images/Alamy Stock Photo



Universal Art Archive/Alamy Stock Photo



TABLE 20.1 Major US Pollution-Control Policies

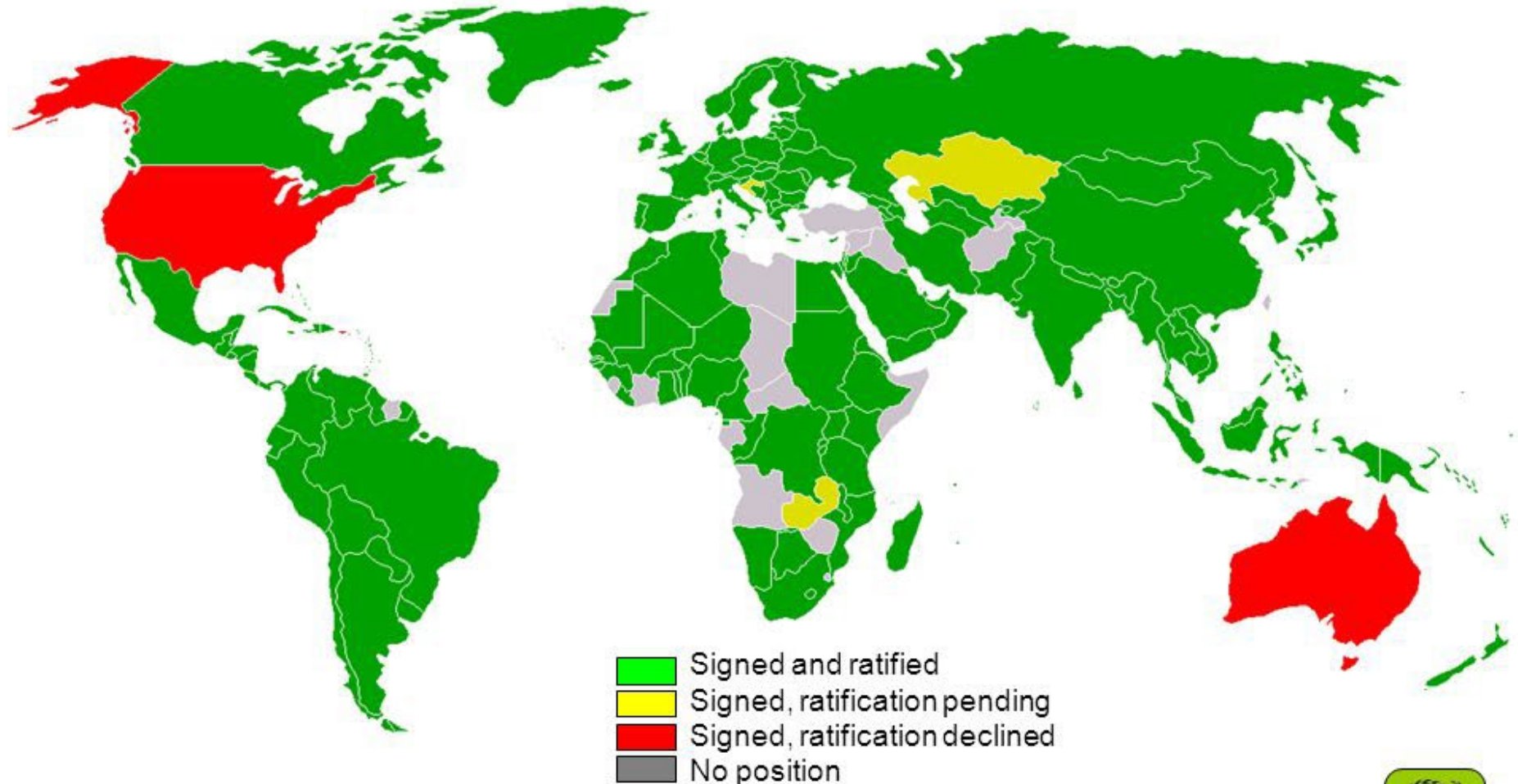
Policy	Substance or Standard Regulated	Federal Responsibilities	State and Local Responsibilities
Clean Air Act (CAA) of 1970 (see Chapter 8)	Air quality and emissions	<ul style="list-style-type: none">EPA sets standards for overall air quality and emissions from polluting sources such as utilities, factories, and vehiclesAct was amended in 1990 to create tradable emission allowances for sulfur dioxide from coal-burning power plants	<ul style="list-style-type: none">State environmental agencies often issue permits and carry out enforcement
Clean Water Act (CWA) of 1972 (see Chapter 7)	Toxic pollutants in surface water	<ul style="list-style-type: none">EPA sets allowable pollution levels for each industry or polluter category on the basis of available pollution-control technology	<ul style="list-style-type: none">State environmental agencies determine water-quality goals for respective state waterwaysOften issue permits and carry out enforcement
Resource Conservation and Recovery Act (RCRA) of 1976	Solid and hazardous waste buried in the ground	<ul style="list-style-type: none">EPA sets standards for solid and hazardous waste management and cleanupEPA implements a hazardous waste program if a state does not have one	<ul style="list-style-type: none">Implement solid waste programsImplement hazardous waste programs if authorized by EPAIssue permits and carry out enforcement
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as “Superfund”) of 1980	Preexisting hazardous waste sites that threaten public health and/or the environment	<ul style="list-style-type: none">EPA identifies potentially responsible parties (PRPs) for the contamination and assigns liabilityAct establishes a trust fund to pay for cleanup when PRPs cannot be identifiedEPA implements cleanup plan if a state cannot	<ul style="list-style-type: none">Implement cleanup plan if authorized by EPAPay part of cleanup costs depending on the state’s role in generating hazardous waste

1997 Kyoto Protocol



UNFCCC

Ratification of the Kyoto protocol



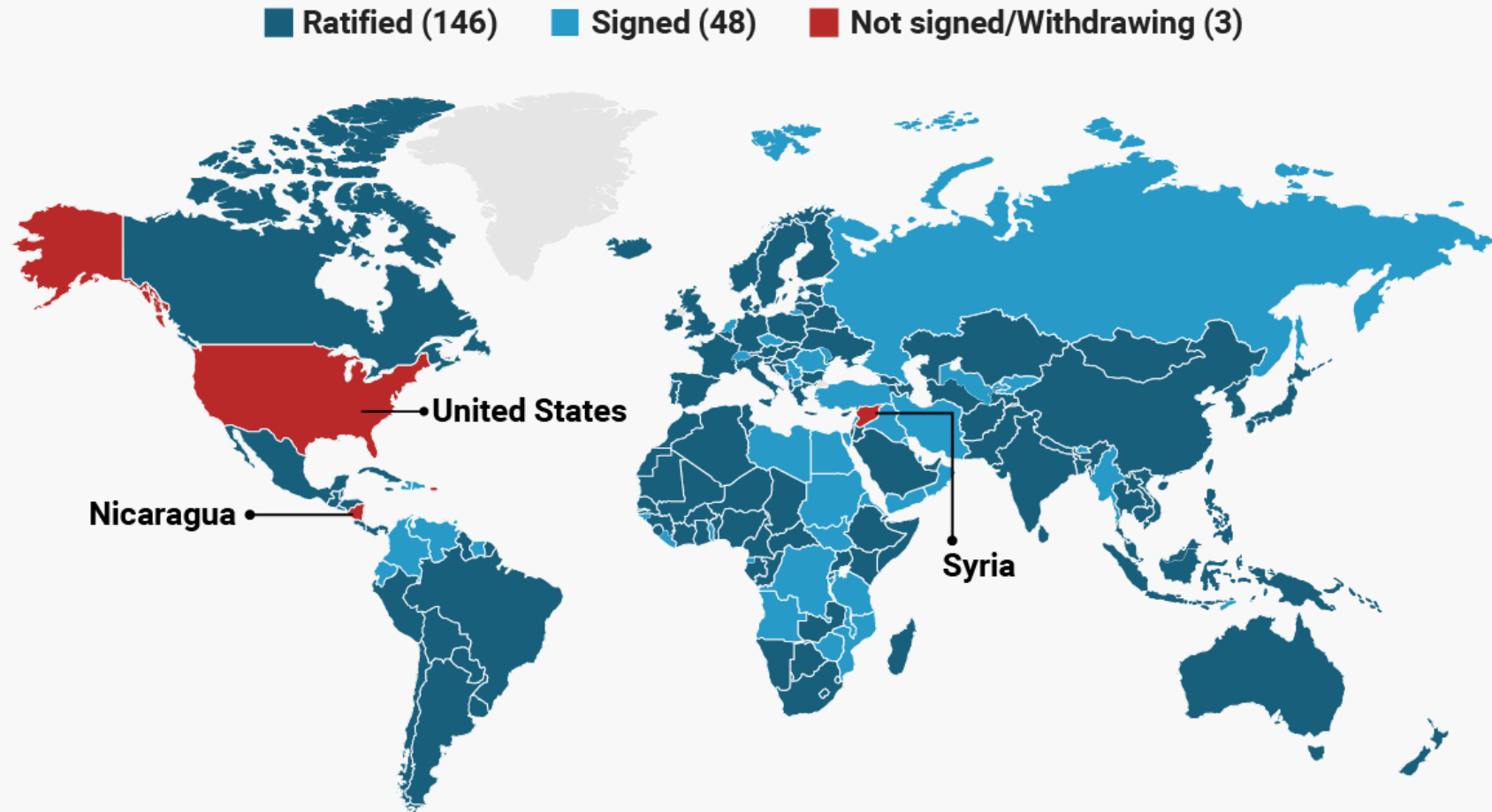
2015 Paris Climate Agreement

Nov. 2017, Syria joins

Oct. 2017, Nicaragua joins

Nov. 2020 U.S.A.,
Withdrawing @ 18% of
Total greenhouse gas
emissions

COUNTRIES THAT JOINED THE PARIS CLIMATE AGREEMENT



SOURCE: UNFCCC NOTE: Denmark's agreement excludes Greenland. Map is updated as of May 31, 2017.

BUSINESS INSIDER

125 Environmental Rules on the Way Out Under USA President

- [NY Times article, 2019](#)
[Popovich, Albeck-Ripka,](#)
[Pierre-Louis](#)



Died in a rocket launch Feb. 2020

What can I do?

- *All politics is local.*
- Become and stay educated on issues important to you.
- Remember the C.R.A.A.P. test?
- Vote
- Constant vigilance

Keys to doing well in life & your career – 2025

Being...

- Critical/Systems Thinker
- Resilient, adaptive
- Effective communicator
- Creative
- Socially engaged & empathetic
- Technologically skilled
- Sustainably minded

