

Global Challenges

UOSM2010 2014

Power

Module leader
James Dyke jd4@ecs.soton

Module webpage
www.gc.soton.ac.uk

Global Challenges

QUIZ

Global Challenges

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Remember to write group name

- 1 What is biodiversity?
- 2 Where is most of the world's biodiversity?
- 3 What was the extinction rate in the 'recent past'?
- 4 What was the dollar value of global ecosystem services in 1997?
- 5 Why is conserving biodiversity hard?

INDIVIDUAL REPORT 2 – The Systems Storm

Student Name:
Student Email:
Student Number:

There are 25 marks in total for this report. This assessment will account for 25% of your total module mark.

The purpose of this report is to apply systems dynamics analysis to the challenge of Beddington's Perfect Storm (hereafter referred to as "The Perfect Storm").

The word limit for this assessment is 1000 words (not including the text of the assessment template which totals 346 words)

REFERENCES. You will need to cite appropriate peer-reviewed literature in

<http://www.gc.soton.ac.uk/assessments>

own work and that you answer each question individually. Working on this assessment by, for example, Student 1 answering question 1, Student 2 answering question 2 and then Student's 1 & 2 incorporating their answers into their respective assessments may be judged to be an example of plagiarism. Discussion is good. Explaining answers to other students is good. Reproducing another student's answer as your own work is not good.

Q1

Describe the Perfect Storm and sketch out its systems dynamics diagram. As well as Beddington's report, refer to relevant peer-reviewed publications.

Q2

Where are the interactions and feedback loops in the Perfect Storm? How do these feedback loops complicate our attempts to address these challenges? Are there any potential multiple stable states, critical transitions and hysteresis?

Q3

Argue whether we are going to be able to successfully navigate the Perfect Storm.

A reference bibliography will be required for this assessment. A Word template for Report 2 can be downloaded here [UOSM2010-2014-Individual-Report-2-Template-FINAL](#). A reference bibliography in the Harvard style is required for this assessment.

www.southampton.ac.uk/library/infoskills/references/harvard.html



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Three questions

1000 word limit

Minimum 200 words for each answer

Each answer worth 1/3 of mark

But some wriggle room...



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Image: <http://www.northenergysystems.com/>

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Photo: <http://senua-hydroponics.co.uk>

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Photo: <http://www.allhawaiinews.com>

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Image: <http://bicycletutor.com/guide>



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Work performed



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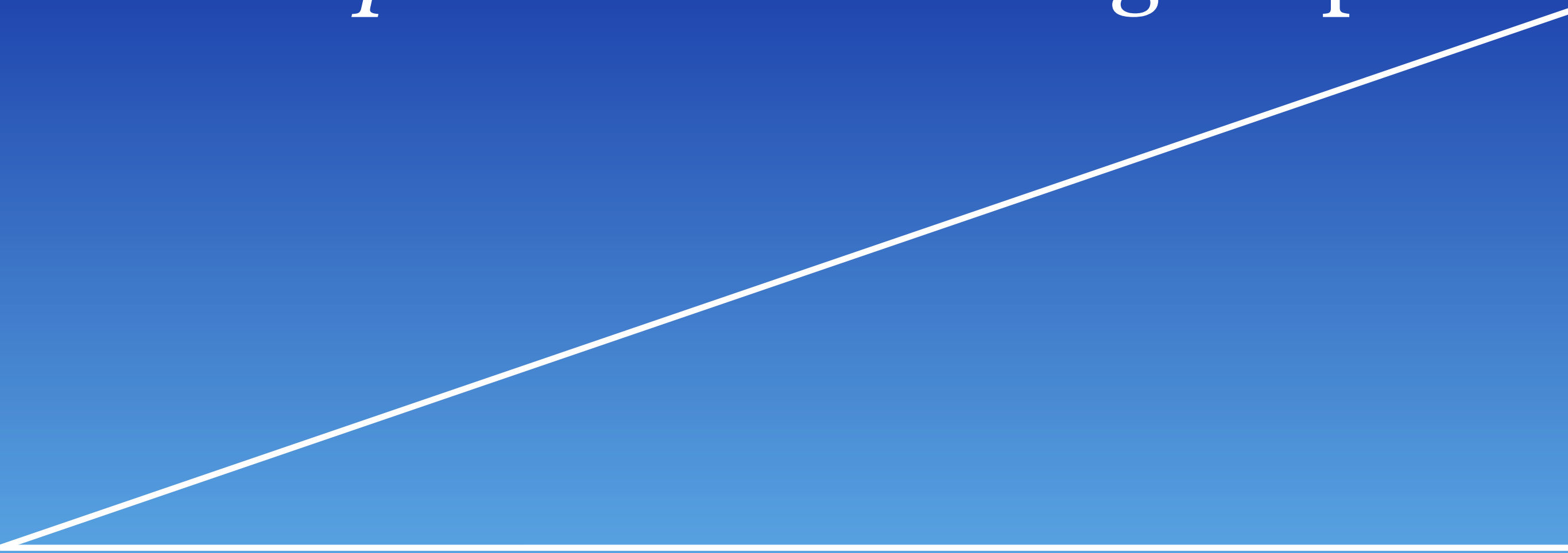
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Work performed

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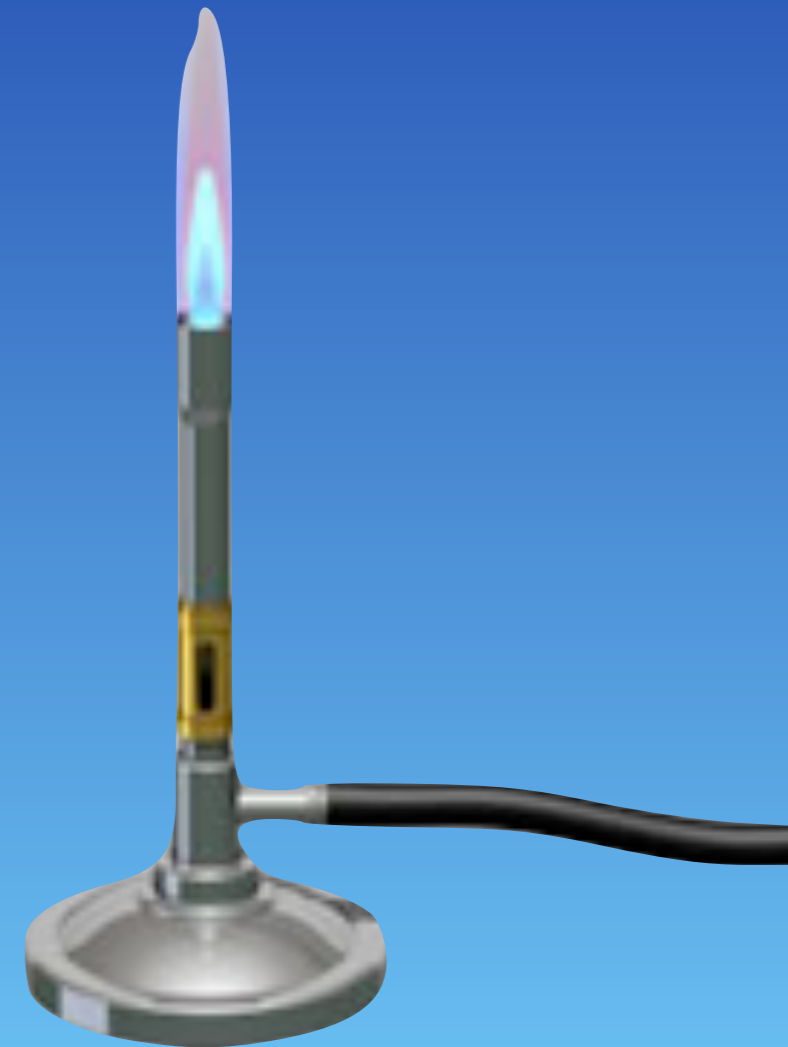
Greater the slope
More *power* needed to get up it

A white line graph is plotted on a blue background. It consists of two lines starting from the same point on the left. One line is horizontal, extending to the right. The other line has a positive slope, extending upwards and to the right.

Power is *rate* of energy use

How much energy
used *per second*

One calorie
1cm³ water increase
temperature by 1C



One calorie
1cm³ water increase
temperature by 1C
One calorie = 4.2 Joules





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100 watt bulb



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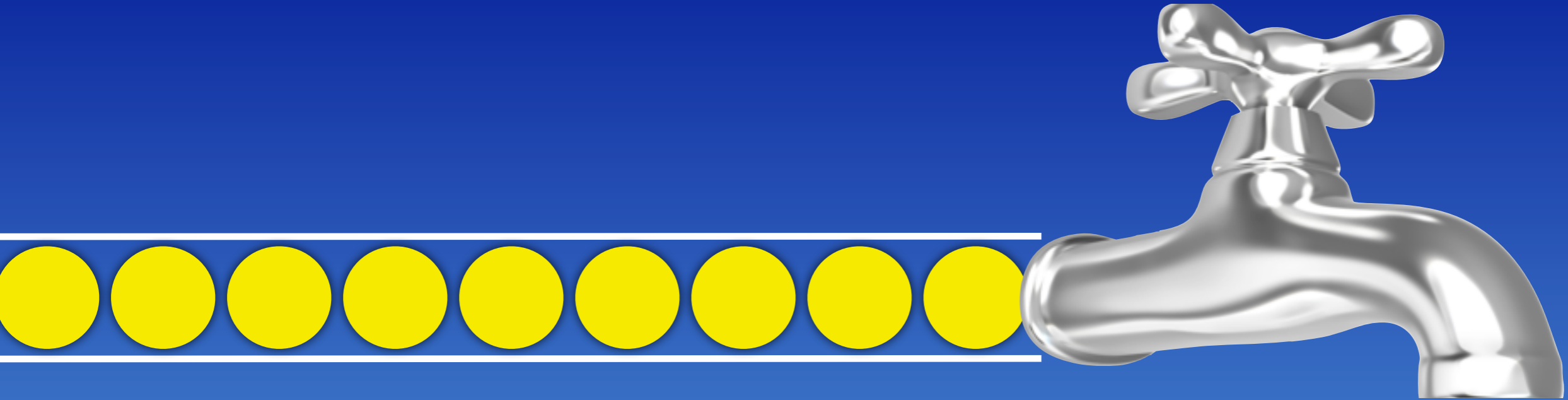
100 watt bulb



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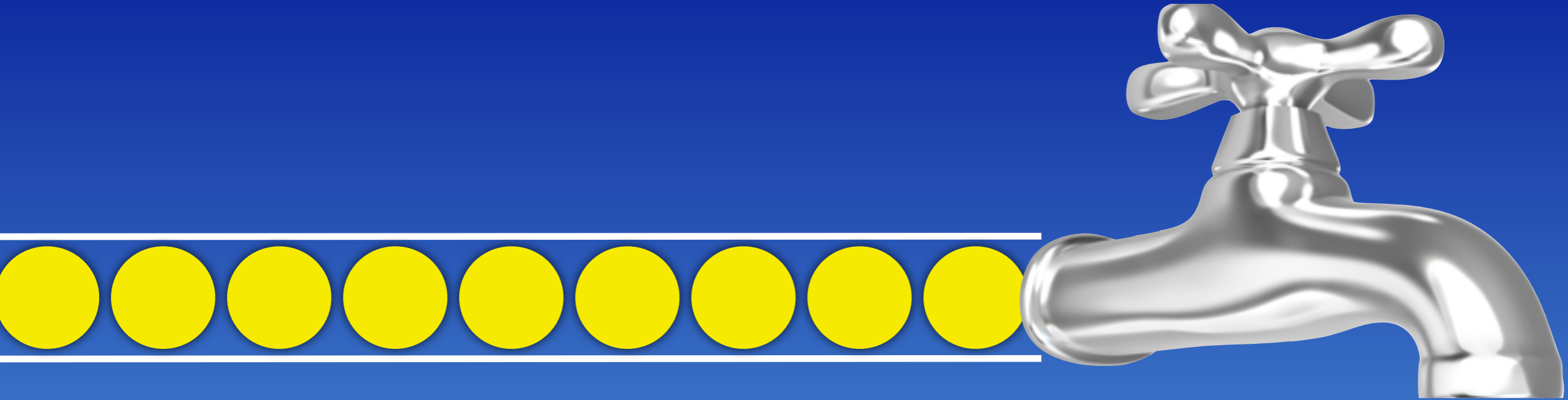
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Faster flow = more watts



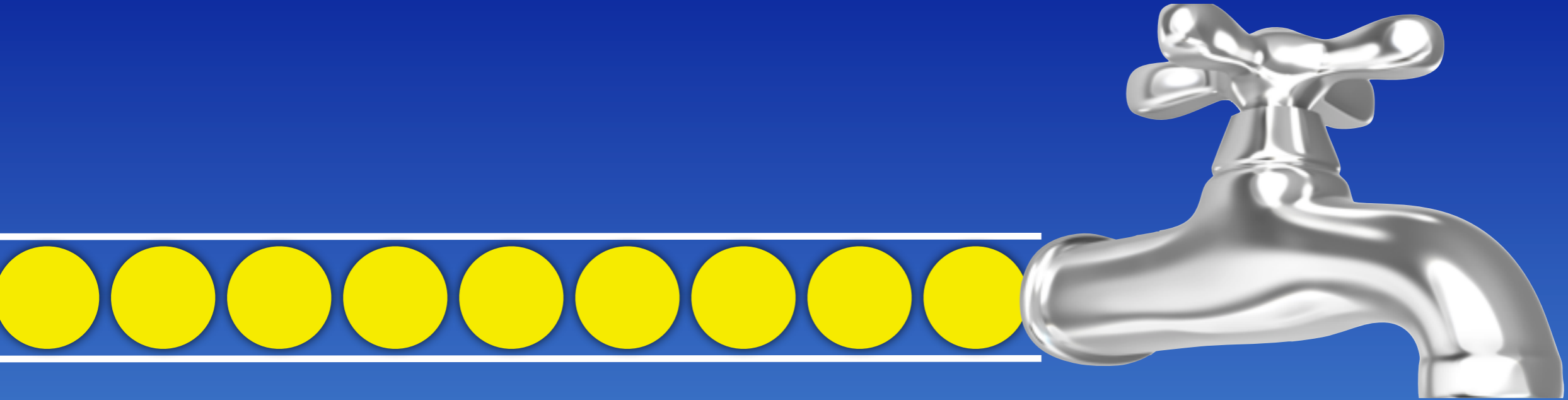
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Faster flow = more watts



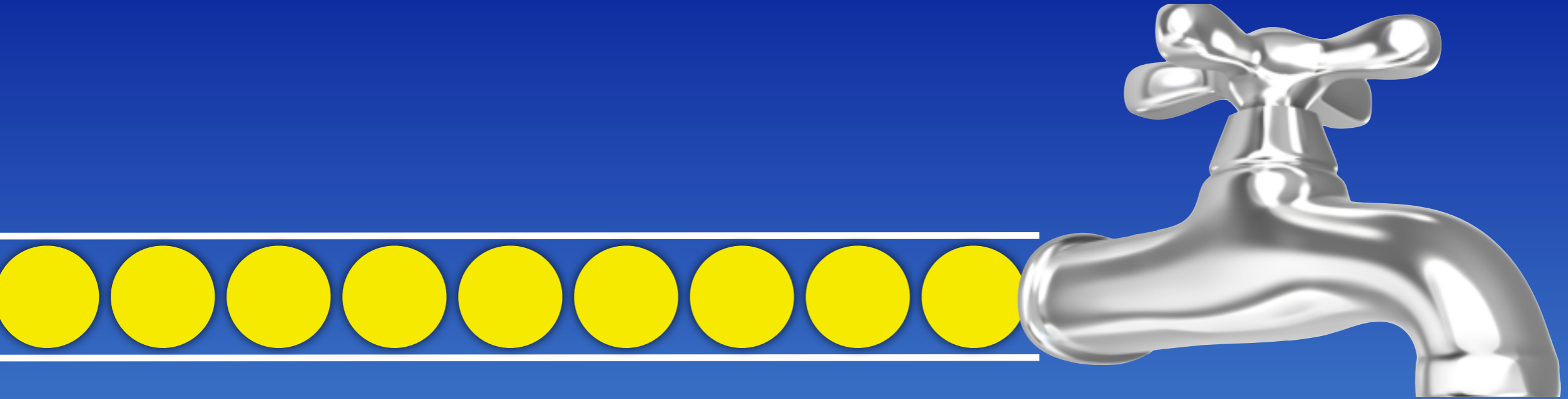
Global Challenges

Faster flow = more watts

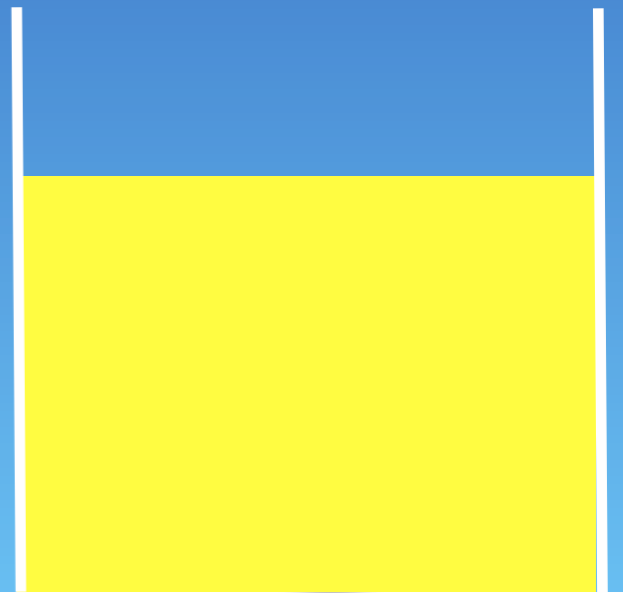


1 watt = 1 Joule per second

Faster flow = more watts



1 watt = 1 Joule per second



Global Challenges

watt	1
kilowatt	10^3
megawatt	10^6
gigawatt	10^9
terrawatt	10^{12}



watt	1
kilowatt	10^3
megawatt	10^6
gigawatt	10^9
terrawatt	10^{12}



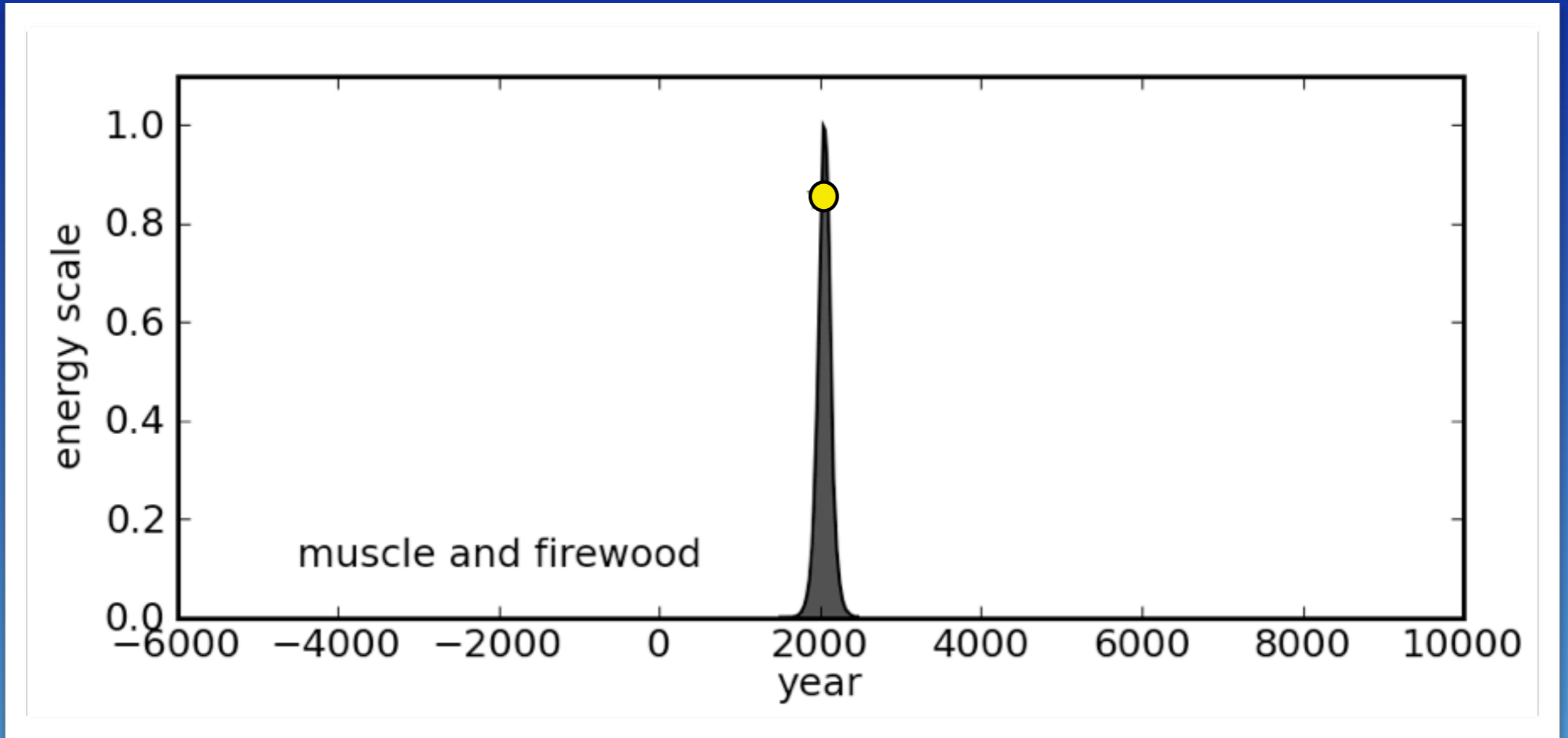
Photo: Wikipedia

watt	1
kilowatt	10^3
megawatt	10^6
gigawatt	10^9
terrawatt	10^{12}

2 megawatt/hours
30min of this

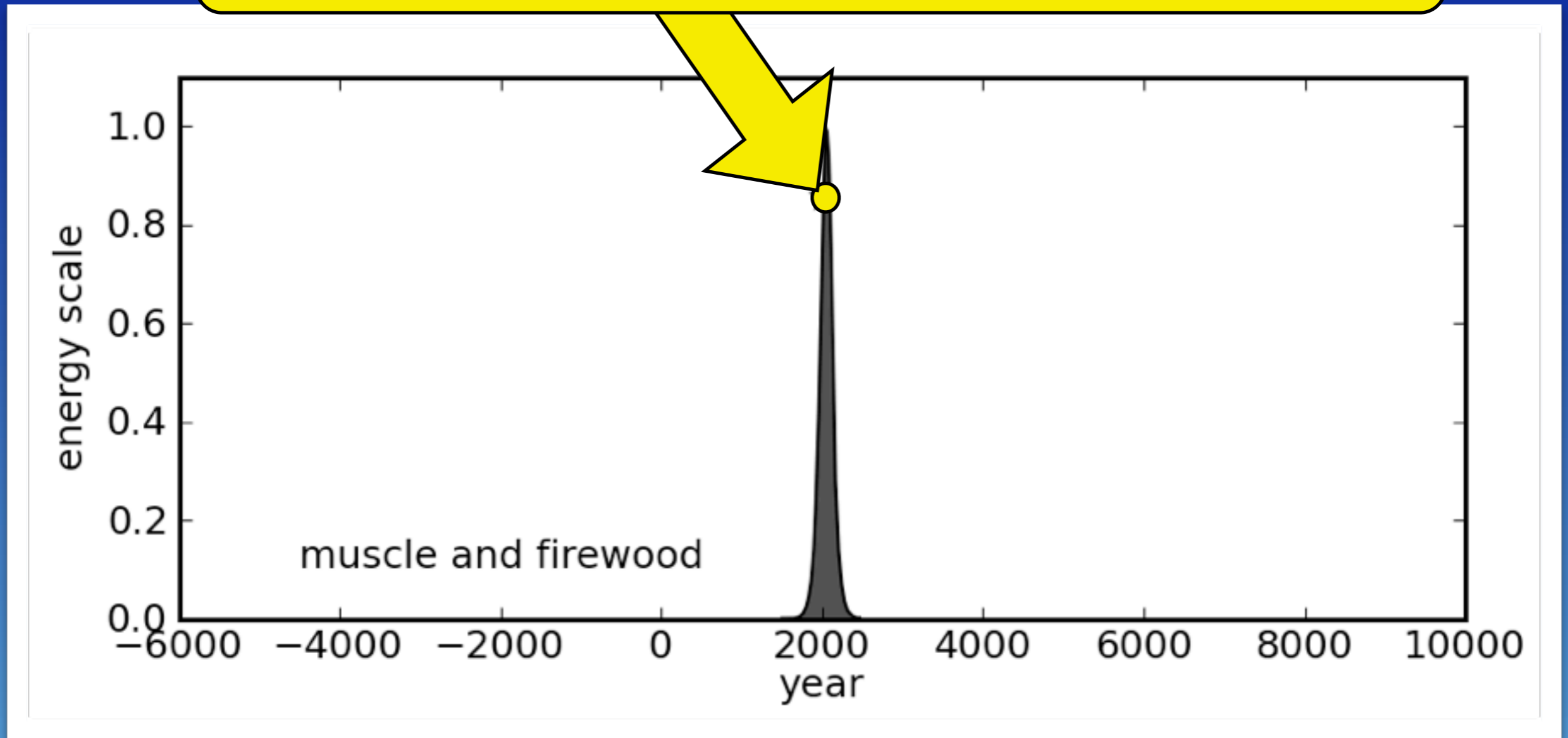


Photo: Wikipedia



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16,000,000,000,000 watts



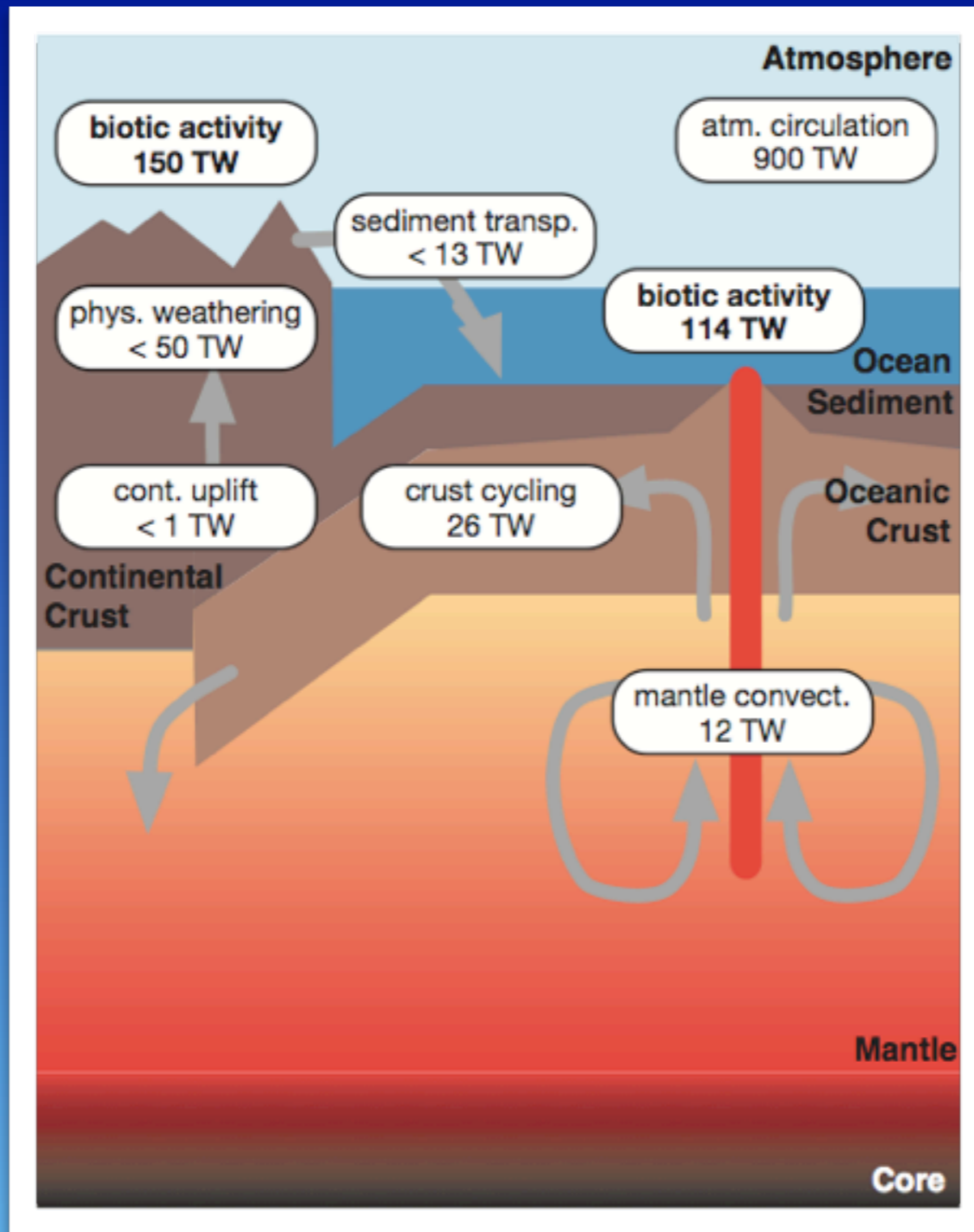


Figure: Dyke, J. G., Gans, F., & Kleidon, A. (2011). *Earth System Dynamics*, 2(1), 139–160

human activity
15 TW

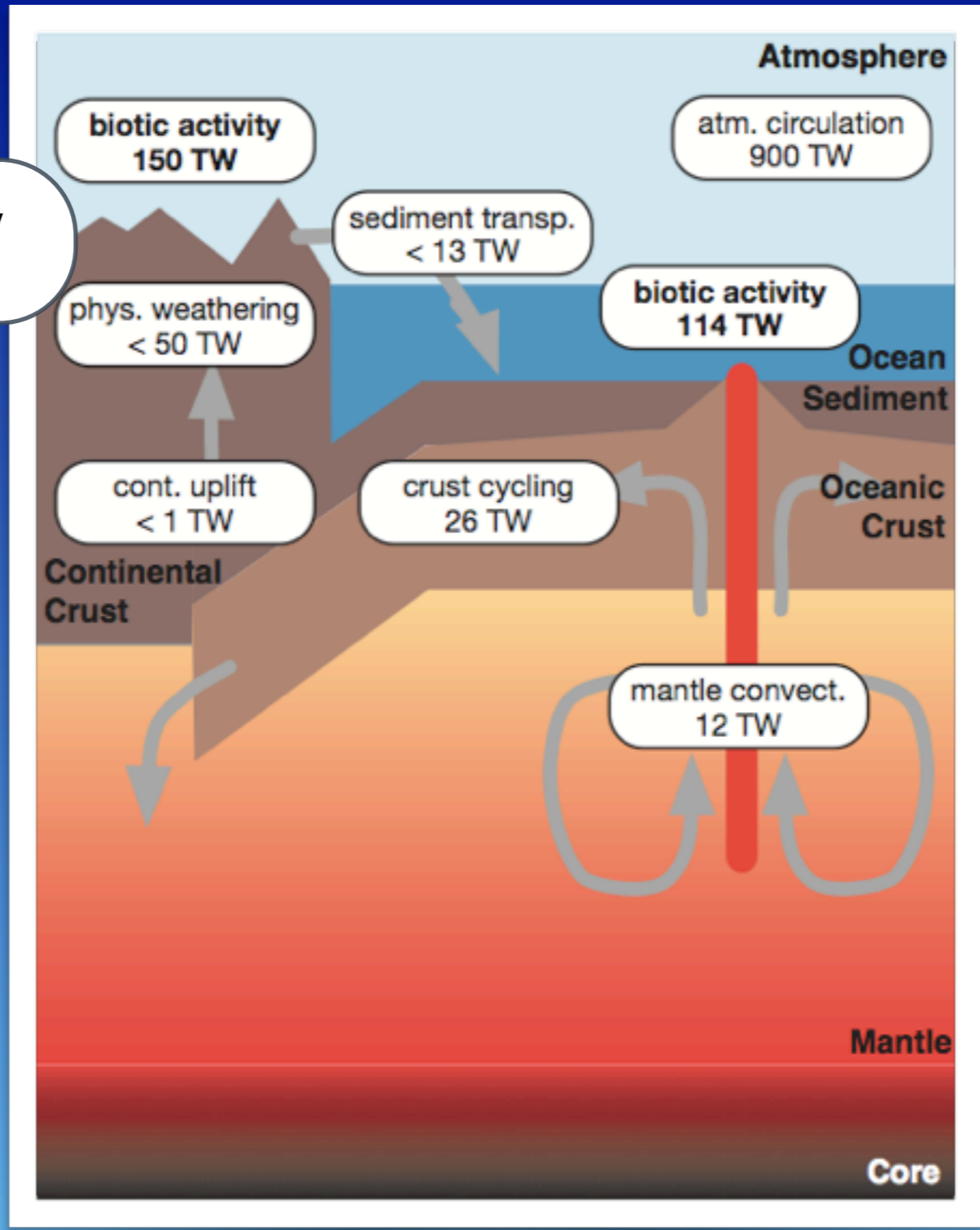
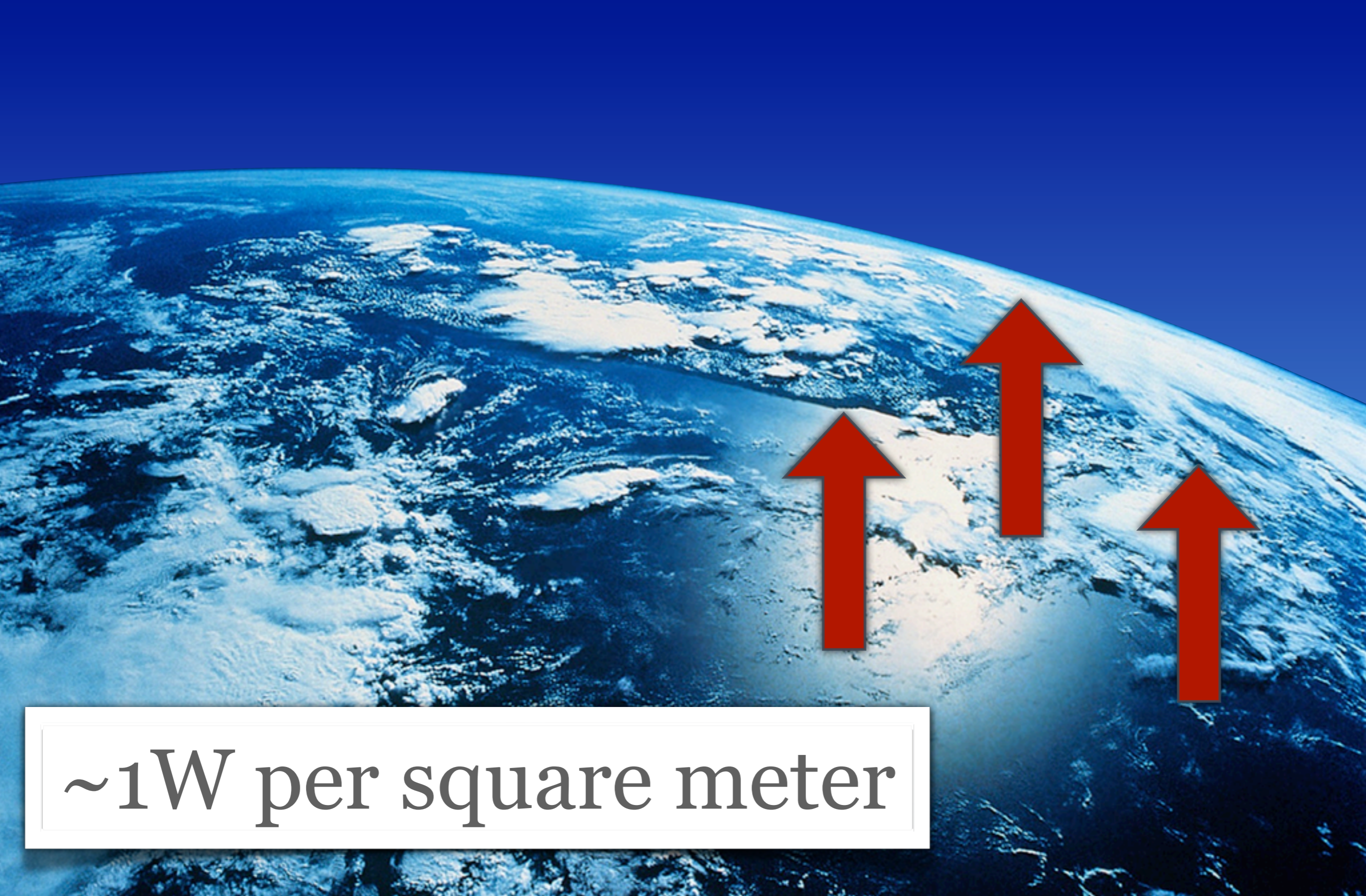


Figure: Dyke, J. G., Gans, F., & Kleidon, A. (2011). *Earth System Dynamics*, 2(1), 139–160

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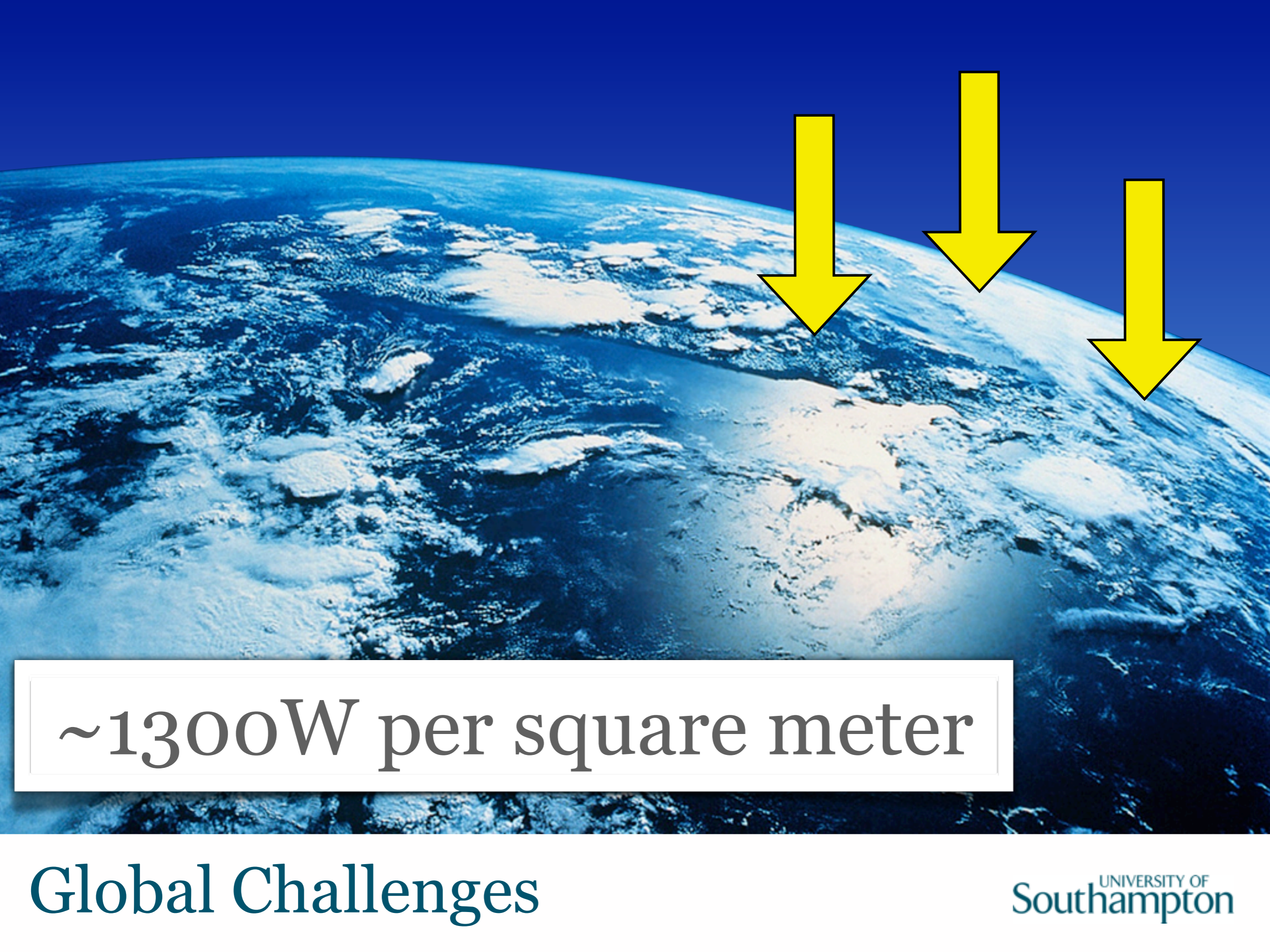


~1W per square meter

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~1300W per square meter

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Image: <http://www.planetunderpressure2012.net/>

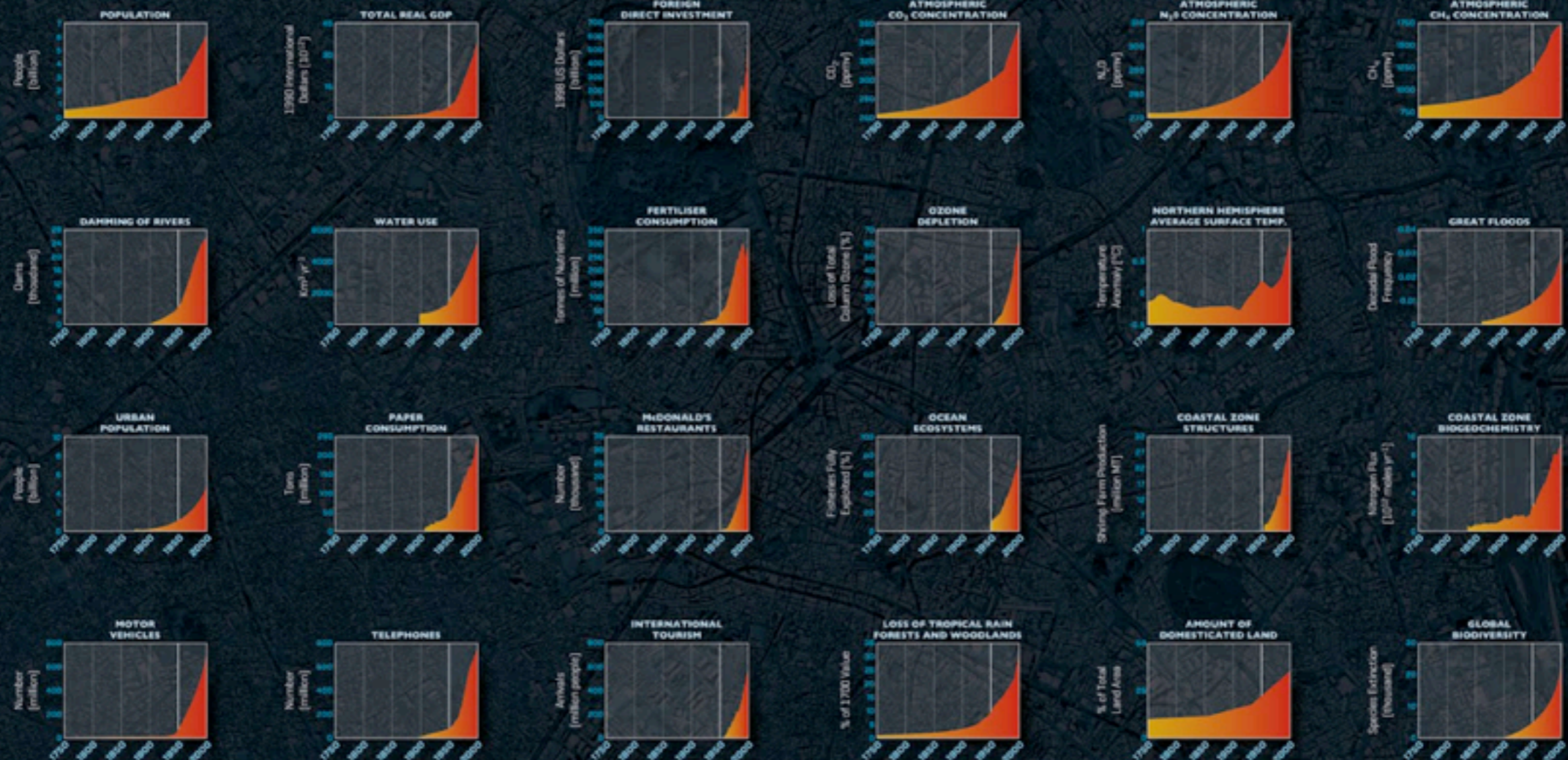
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THE ANTHROPOCENE

The Anthropocene defines Earth's most recent geologic time period as being human-influenced, or anthropogenic, based on overwhelming global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are now altered by humans.

The line corresponding to 1950 highlights the Great Acceleration, the post-World War II worldwide industrialization, techno-scientific development, nuclear arms race, population explosion and rapid economic growth.

These graphs were compiled in a publication of the International Geosphere-Biosphere Programme (IGBP).



SOURCE: igbp.net | Steffen et al., 2005, Global Change and the Earth System, Springer, pp. 132-133
 DESIGN: Globaia.org

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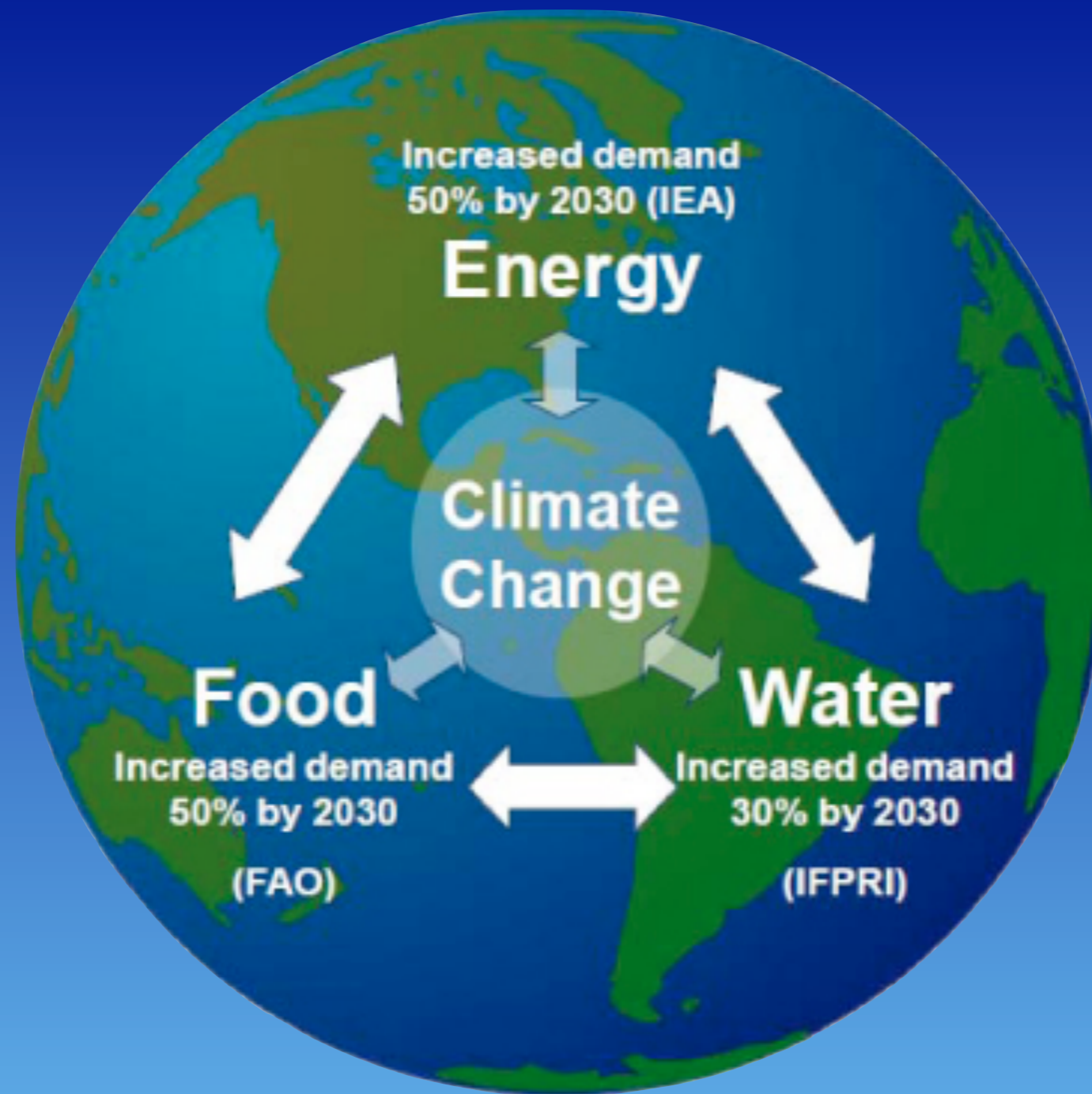


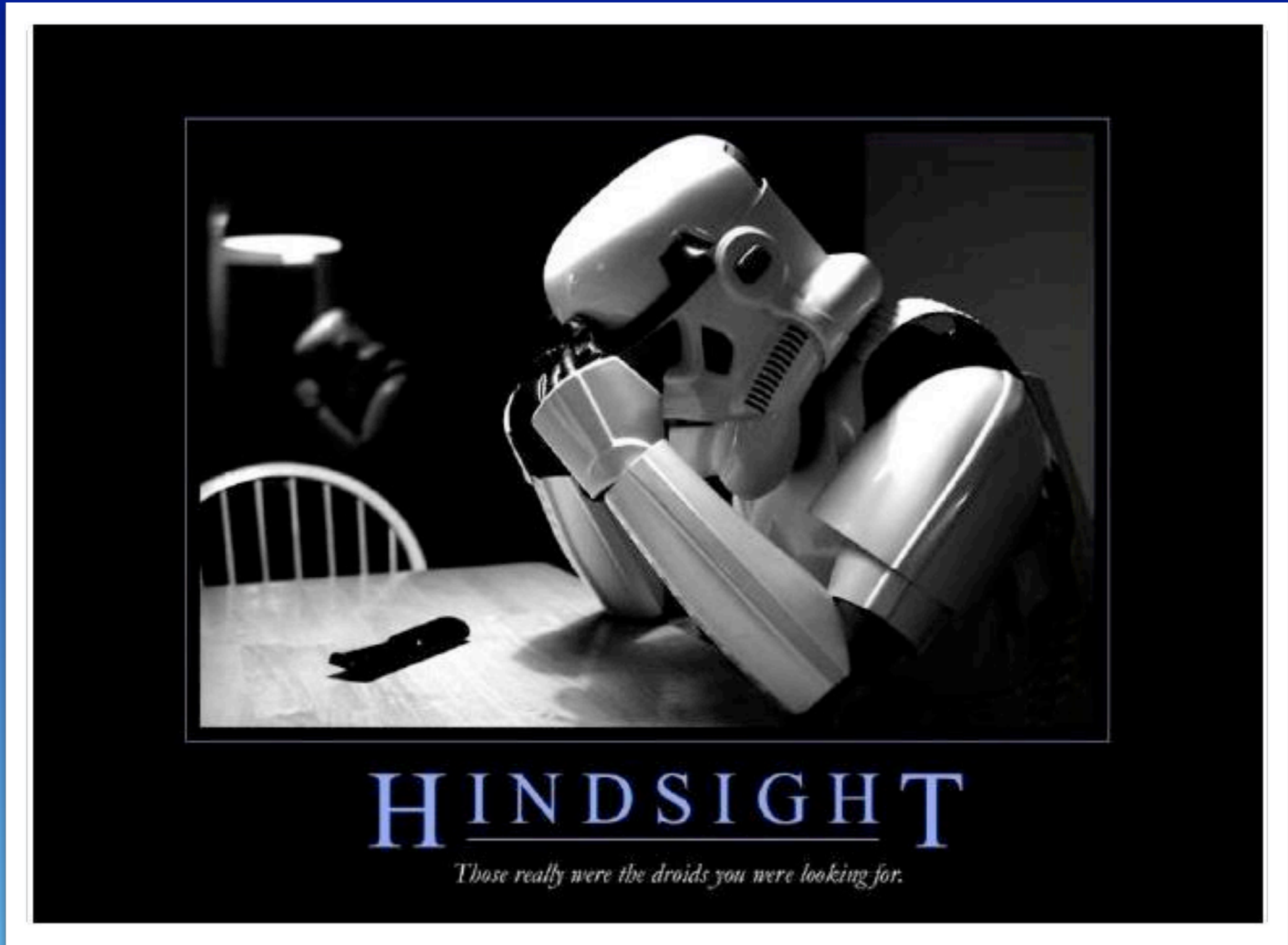
Image: <http://www.igd.com>

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iStockPhoto/123ArtistImages

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I messed up the groups on Blackboard...

Members *cannot* edit their group description

But they can create other content. I *think*

I need to check what you
can/can't do in your groups

Please logon to Blackboard, find your group

Can you add a Wiki item?

Group working

If you leave theatre, tell me where you are going

I will come round and visit each group

All groups report back here no later than 11:35

Work in groups on Assessment 3

Who is the audience?

What's the t-shirt message?

Write out brief narrative *not* description of poster

Or

If most of your group is away

Produce a first draft Systems Storm diagram
that's required for Q1 Assessment 2

Who is the audience?

What's the t-shirt message?

Write out brief narrative *not* description of poster

Or

Produce a first draft Systems Storm diagram

Global Challenges (UOSM2010) Course Schedule 2014

		Tuesday 12:00-13:00	Friday 09:00-11:00	Guest Lecturer	Assessments	Reading
1	27/1/14	Welcome & Introduction	The Global Challenges			Millennium Project
2	3/2/14	Systems Primer	Assessments Workshop			6 Hats
3	10/2/14	Planetary Boundaries	Climate Change Workshop	John Shepherd		<u>Beddington</u>
4	17/2/14		Governance Workshop	Claire Saunders		<u>Ostrum</u>
5	24/2/14	Coursework Lab	Population Workshop	Jane Falkingham	Report 1	<u>Erlich</u>
6	3/3/14	Doughnut workshop	Energy Workshop	Gail Taylor		Conversation
7	10/3/14	Assessments & Food Workshop	Biodiversity Workshop	Guy Poppy Felix Eigenbrod		Wilson
8	17/3/14	Peak Phosphorus	Time Machine Workshop	Wendy Hall		Burke
9	24/3/14	Coursework Lab	Giving a Talk Workshop		Report 2	Wilson
10	28/4/13	Coursework Lab	GC Conference		Posters	WHO
11	5/5/13	GC Conference	GC Conference			
12	12/5/13	GC Conference	We Choose the Earth			Jackson

Global Challenges

For 18/3/2014

Read

Recommendations & Evidence from the
Planetary Boundaries Initiative points 1-8

Read

Thinking in Systems pages 111-141

If you would were to tell a
friend about this module

Why should they think about doing it?

Why should they think about avoiding it?

Tips For Kicking Junk Food Cravings

Have your favorite foods forced you to change your wardrobe to larger sizes? Do you find it hard even impossible to resist getting that slice of cake with your lunch every day? If so, here are some great ways to alter those bad habits.

Identify Your Triggers

Cravings are mental responses to specific triggers. The first step in overcoming the habit is to understand when and why you crave junk food. Common triggers include the right time, stressful situations, when people are alone, hunger, feeling tired, bored, sitting in front of the TV, etc.

Redirect Your Response

- If you are bored find something active to do, take a run, clean your room, or walk your dog.
- Avoid mindless eating when watching TV, sitting in front of the computer or doing work.
- Reduce stress by meditating, listening to soothing music, or taking a bath.
- Find new ways to respond to your triggers. When negative emotions such as loneliness are resolved by activities other than eating, for example calling a friend, the association of food used to cope with triggers can be replaced over time.
- Take your mind off of food by distracting yourself. Take a walk, read a book, or paint.
- To boost your energy level take a brisk walk, a power nap, eat an energy bar.
- Sometimes cravings come up when we are merely hungry. Aim for filling meals with vegetables and protein.

{ Additional Tips }

- Drink this not that.
- Find healthy yet tasty substitutes for junk food. Have a parfait instead of ice cream, replace regular salmon for turkey bacon.
- Write it all out. Keeping a journal can help channel your triggers, keep track of your progress and help avoid giving into cravings.
- Eat this not that.

Find A Support System

Friends and support groups with your similar goals can be a great help when you start to lose motivation. Having others to share your experiences with can ensure your success in the long run!

Tips For Kicking Junk Food Cravings

Have your favorite foods forced you to change your wardrobe to larger sizes? Do you find it hard even impossible to resist getting that slice of cake with your lunch every day? If so, here are some great ways to alter those bad habits.

Identify Your Triggers



Cravings are mental responses to specific triggers. The first step in overcoming the habit is to understand when and why you crave junk food. Common triggers include the right time, stressful situations, when people are alone, hunger, feeling tired, bored, sitting in front of the TV, etc.

Redirect Your Response



If you are bored find something active to do, take a run, clean your room, or walk your dog.

Avoid mindless eating when watching TV, sitting in front of the computer or doing work.

Reduce stress by meditating, listening to soothing music, or taking a bath.

Find new ways to respond to your triggers. When negative emotions such as loneliness are resolved by activities other than eating, for example calling a friend, the association of food used to cope with triggers can be replaced over time.

To boost your energy level take a brisk walk, a power nap, eat an energy bar.

Remember, cravings come on when we are merely hungry. Aim for filling meals with vegetables and protein.

{ Additional Tips }



Drink this or that.

Find healthy yet tasty substitutes for junk food. Have a parfait instead of ice cream, replace regular salmon for turkey bacon.

Write it all out. Keeping a journal can help channel your triggers, keep track of your progress and help avoid giving into cravings.

Find A Support System



Friends and support groups with your similar goals can be a great help when you start to lose motivation. Having others to share your experiences with can ensure your success in the long run!

One section per group member

Tips For Kicking Junk Food Cravings

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Redirect Your Response

- If you are bored find something active to do, take a run, clean your room, or walk your dog.
- Avoid mindless eating when watching TV, sitting in front of the computer or doing work.
- Relieve stress by meditating, listening to soothing music, or taking a bath.
- Find new ways to respond to your triggers. When negative emotions such as loneliness are resolved by activities other than eating, for example calling a friend, the association of food used to cope with triggers can be replaced over time.
- To boost your energy level take a brisk walk, a power nap, eat an energy bar.
- Take your mind off of food by distracting yourself. Take a walk, read a book, or work.
- Remember, cravings come on when we are merely hungry. Aim for filling meals with vegetables and protein.

{ Additional Tips }

- Drink this not that: Water vs. Soda.
- Find healthy yet tasty substitutes for junk food: Have a parfait instead of ice cream, replace regular salmon for turkey bacon.
- Eat this not that: Fruit vs. Candy.
- Write it all out. Keeping a journal can help channel your triggers, keep track of your progress and help avoid giving into cravings.

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Additional Tips

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- Find healthy yet tasty substitutes for junk food: Have a parfait instead of ice cream, replace regular salmon for turkey bacon.
- Write it all out. Keeping a journal can help channel your triggers, keep track of your progress and help avoid giving into cravings.
- Eat this not that: Apples vs. Bananas.

Friends & Support Groups

Friends and support groups with your similar goals can be a great help when you start to lose motivation. Having others to share your experiences with can ensure your success in the long run!

Bibliography

One section per group member



3 references per group member



Bibliography

One section per group member

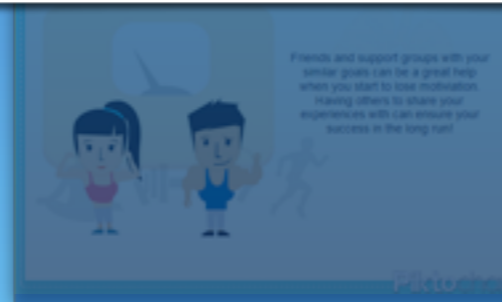


3 references per group member



6 in a group give 18 references

Bibliography



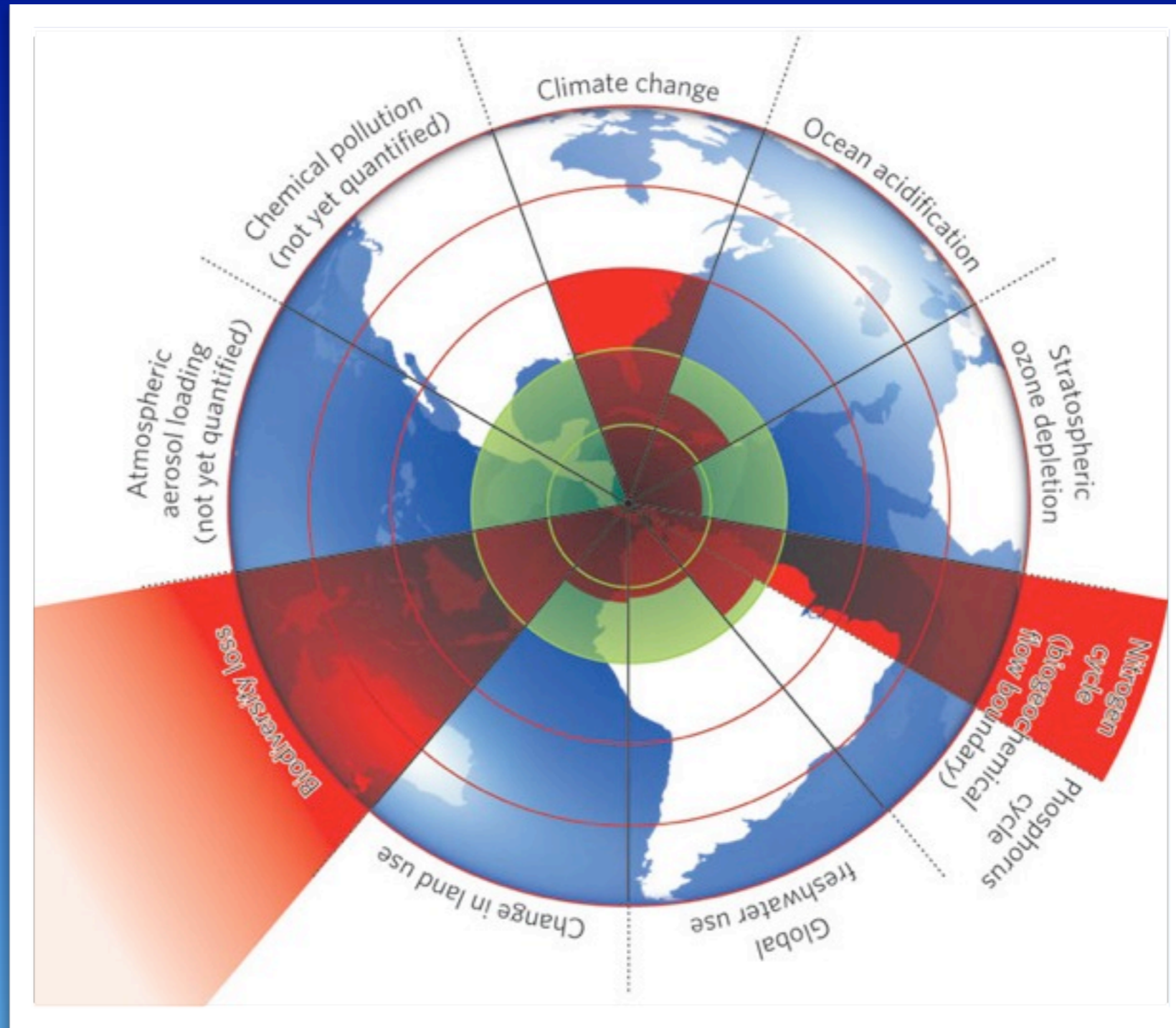


Figure: J. Rockström et al (2009) *Nature* 461, 472-475

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