Bringing Efficiency to Research Grants (BETR Grants):

Why there is a need to connect efficiency with federal funding for research at universities

Kathy Ramirez-Aguilar, Ph.D.
CU Green Labs Program
University of Colorado Boulder
kramirez@colorado.edu

Greening Federal Grants

Previous Name

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Bringing Efficiency to Research Grants (BETR Grants)

Current Name

Learning Objectives

- Learn why scientists are facing such tough competition for federal funding
- Learn how missing requests for efficiency in the federal grant funding process enables a culture leading to inefficiency
- Learn about the benefits to science resulting from efficiency (Christina Greever presentation in A4)
- Learn about a website tool for incorporating actions for efficiency in grant proposals and how BETR Grants relates to Smart Labs Accelerator

Bringing Efficiency to Research Grants (BETR Grants) is about connecting efficiency with federal research funding

Efficient use of resources:

- Maximize effective use of federal research funding
- Minimize the environmental footprint of research

BETR Grants: Are there connections to federal funding that can greatly improve?:

Equipment Sharing

Space Efficiency

Selection of Energy/Water/Material Efficient Processes & Equipment

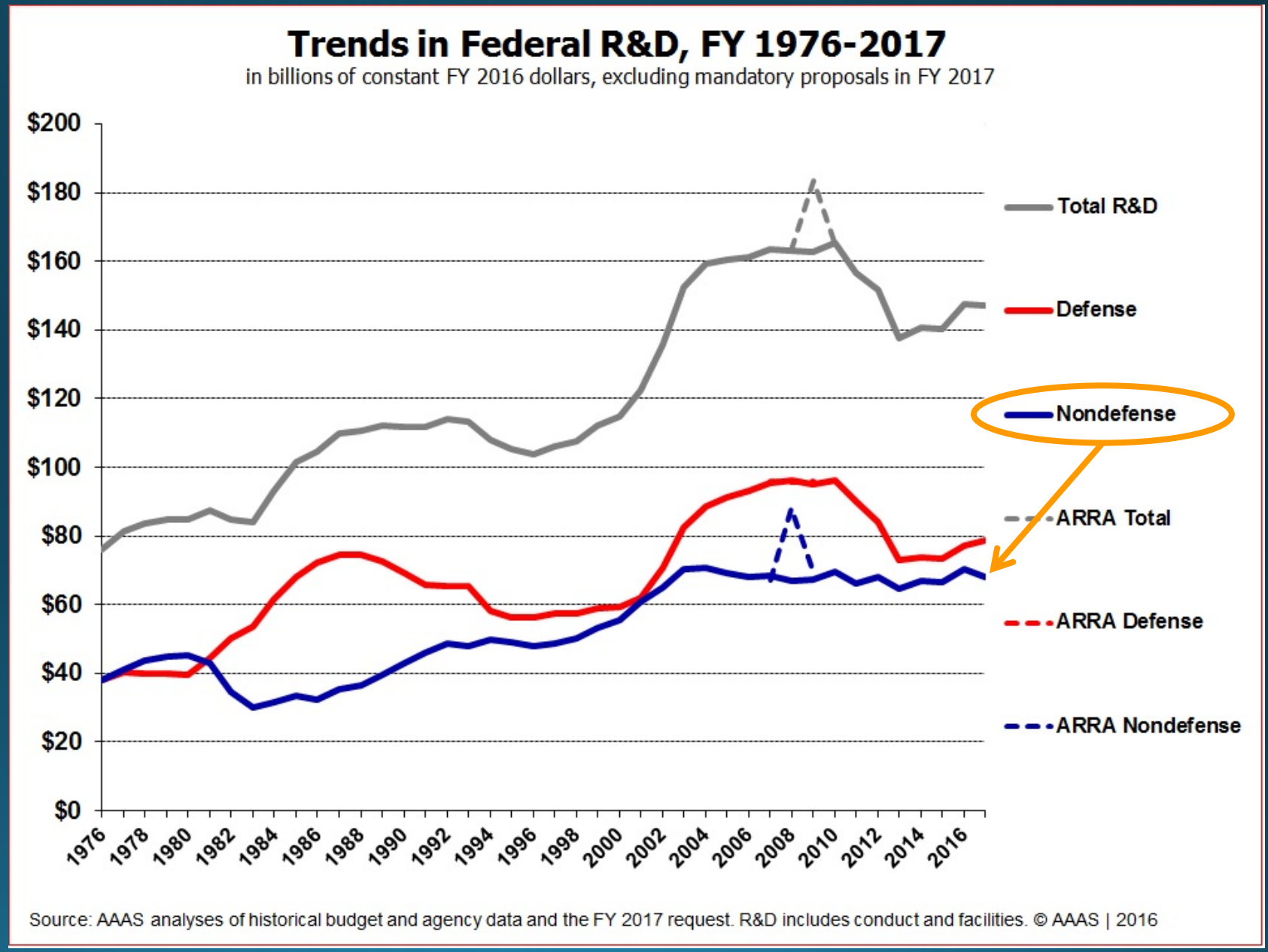
IT resource sharing

Majority of US University Research Is Funded by Federal Government

% research funding from federal govt.

CU–Boulder (FY14) = 80%
Univ. of Michigan (FY14) = 57%
Dartmouth (~FY14) = 86%
Stanford (~FY14) = 80%
Univ. of Florida (FY14) = 66%
Northwestern Univ. (FY14) = 73%
Univ. of Chicago (FY13) = 74%
Iowa State (FY15) = 53%
Penn State (FY14) = 62%
Rutgers Univ. (FY14) = 53%
UC-Davis (FY14) = 53%
UC-Irvine (FY15) = 66%
UC-Santa Barbara (FY15) = 78%
Univ. of Kansas (FY14) = 80%
Univ. of Minnesota (FY15) = 61%
Univ. of Oregon (FY15) = 90%
Univ. of Washington (FY15) = 80%
Princeton (FY14) = 72%
Univ. of Rochester (FY15) = 75%
Univ. of Wash.- St. Louis (FY15) = 75%

Non-defense R&D funding plateaued in 2003



ARRA = American Recovery and Reinvestment Act

Scientists facing rising competition for federal funding

Small or lack of increases in federal research funding

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More university scientists competing for federal funding

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Inflation decreasing buying power of federal funding

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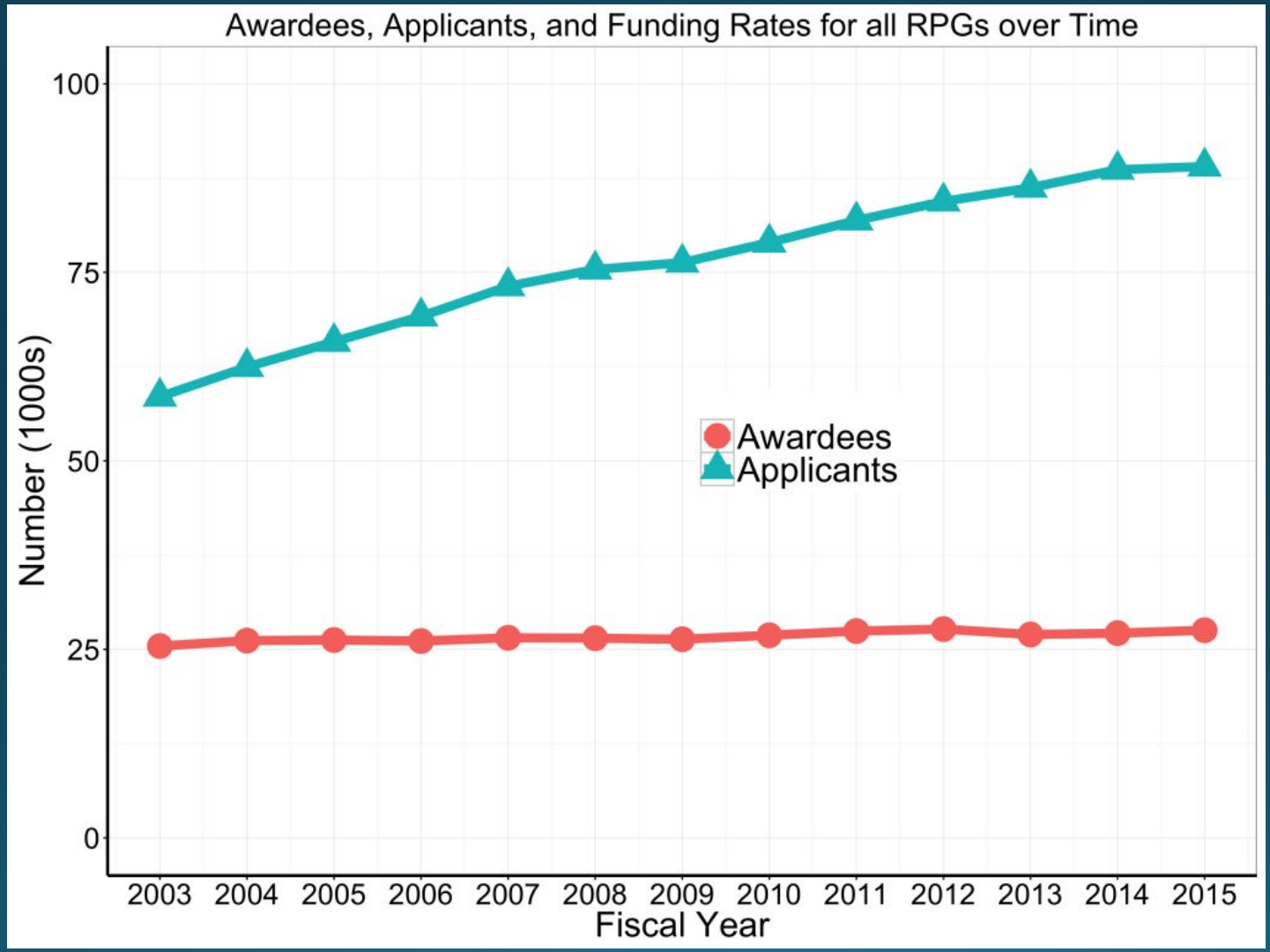
Rising competition for federal funding

Competition for Funding Keeps Rising



Source: Michael Lauer, Deputy Director of OER, NIH
https://nexus.od.nih.gov/all/2016/05/31/how-many-researchers/

During the grant application process and spending of those dollars, there are missed opportunities for federal granting agencies to ask or encourage scientists to:

1. Select lab equipment and processes that are energy/water/material efficient where possible (and that use green chemicals)

2. Share equipment and make use of existing equipment resources already on campus

3. Use campus lab space and fume hoods efficiently & effectively

4. Encourage computer resource, software, & data sharing

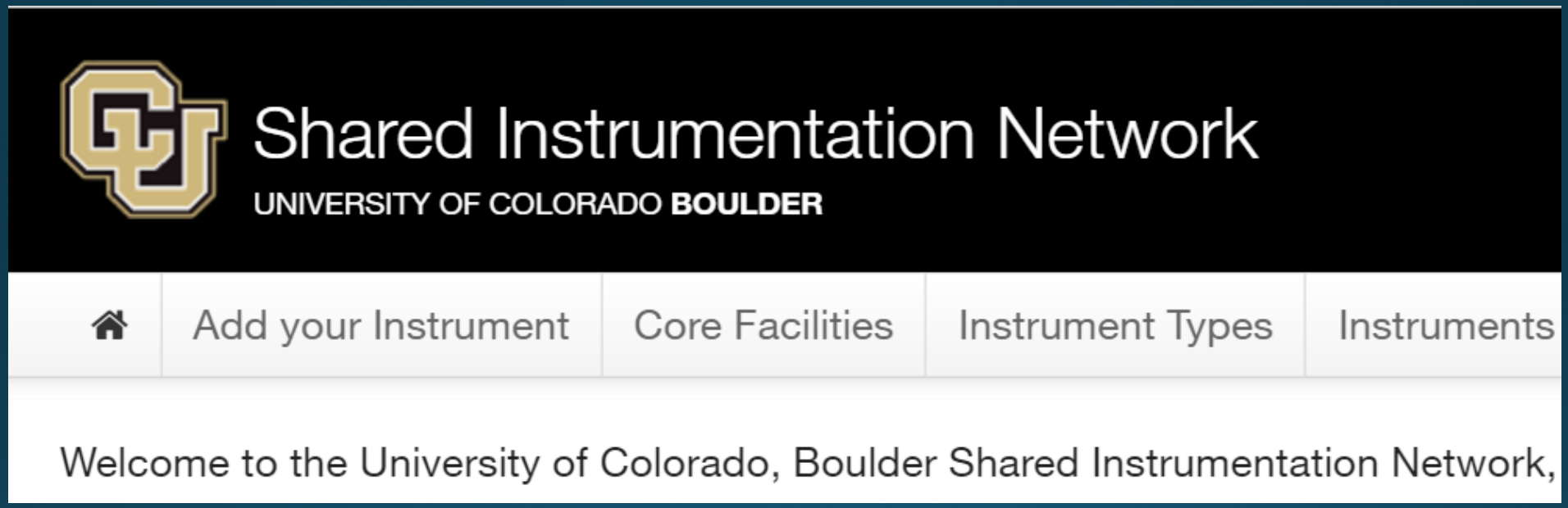
Individualized space with individualized resources leads to duplication

Floor centrifuge

Lack of awareness of what equipment resources exist on campus

Scanning electron microscope

Shared Instrumentation Network Website



http://www.colorado.edu/sharedinstrumentation/

Many thanks to UC-Santa Barbara for sharing platform with CU-Boulder.

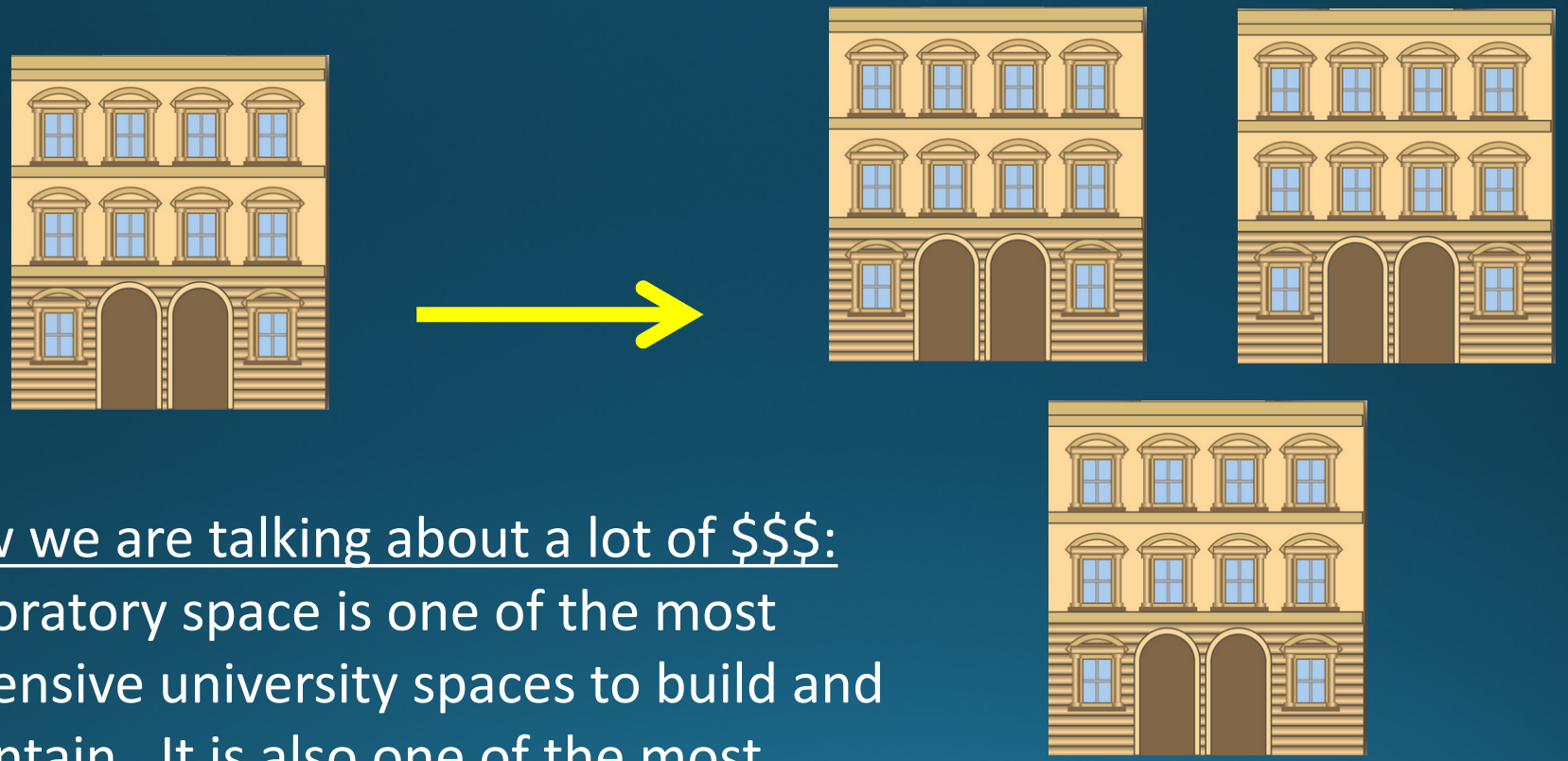
Lab research can change directions

Equipment that a lab needs now, may not be needed later.

Understandably, a lab may not want to let equipment go because they may need it in the future.

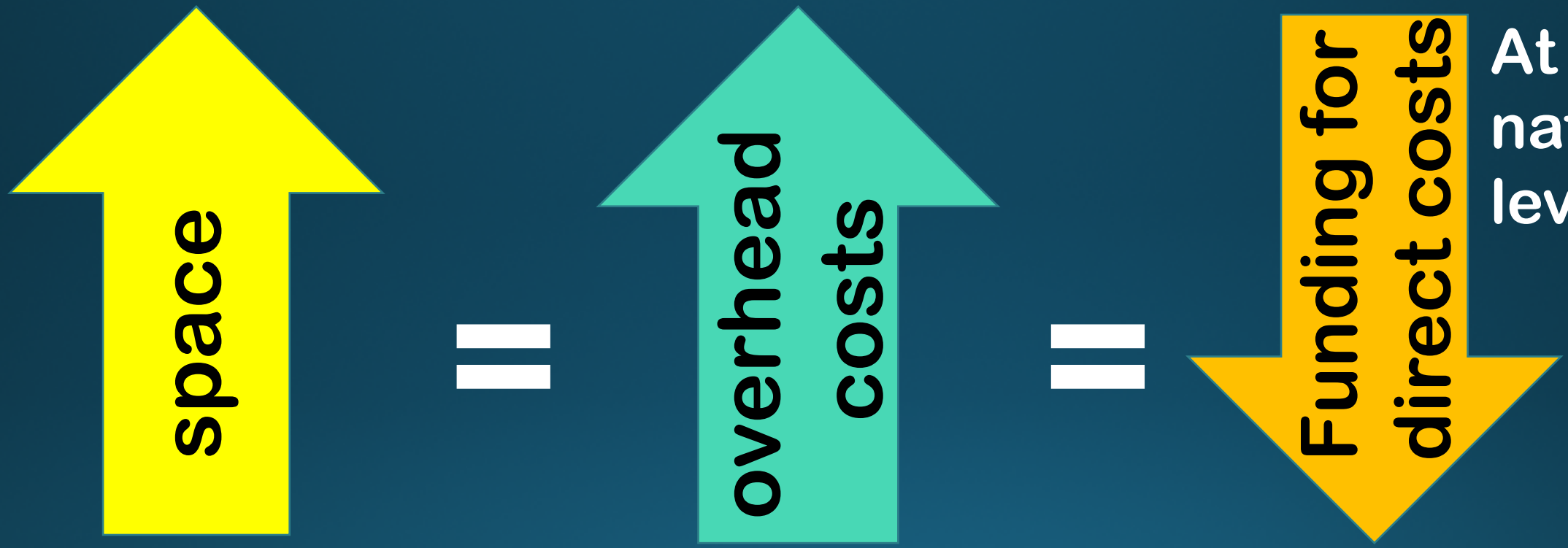
As a result, it is not uncommon to find unused or underutilized equipment in labs

Individualized resources leads to not only inefficient use of equipment resources, but importantly, space resources



<u>Now we are talking about a lot of $$$:</u>
Laboratory space is one of the most expensive university spaces to build and maintain. It is also one of the most energy intensive spaces on campus.

The more space, the greater the overhead costs to support research



Costly to the federal government and universities

Various names for overhead costs

Facilities & Administrative (F&A) costs = Indirect Costs (IDC) = Indirect Cost Recovery (ICR)

The slides that follow describe this process for universities that receive more than $10 million in federal funding for direct costs. Below $10 million there is a simplified process.

How is an overhead rate calculated & applied?

How is the Facilities & Administrative (F&A) rate calculated?

$$\text{F\&A Rate} = \frac{\text{F\&A expenses supporting research}}{\text{modified total direct costs}} \times 100$$

How is the rate applied?

- Example rate = 54%
- Example grant of $1,000,000
- Ideally, university could expect to receive $540,000 for overhead costs (this is in addition to the $1,000,000 the scientist has been awarded)
- But effective rate is lower since there are items that cannot be included (a typical effective rate is around 30%)

Two components of F&A rate calculation

Two general components of overhead costs:

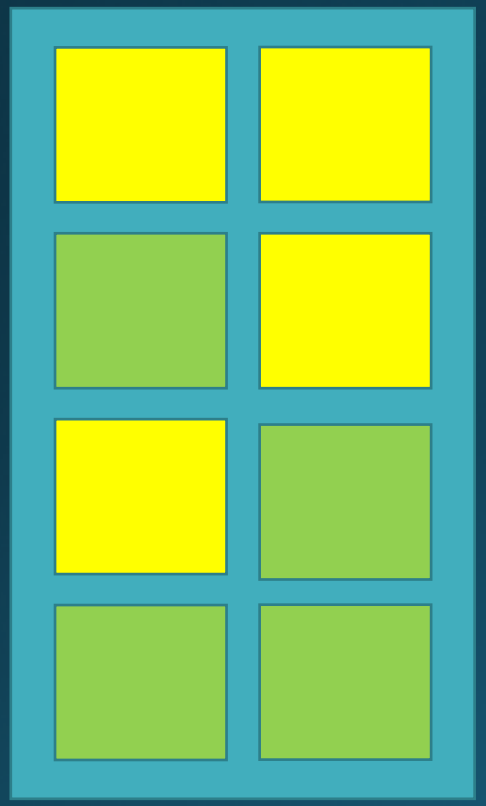
1. Administrative costs (capped at 26% since 1991)
2. Facilities costs (not capped)
   - Building and equipment depreciation
   - Operations & maintenance of facilities
   - Other (library, interest on facility debt)

Two components calculated and added together:

F&A Rate = Administrative % + Facilities %

How does space connected with sponsor funding affect rate calculation for “facilities” portion?

Example building



If a space survey finds that 50% of this building’s space is connected with sponsor funding during the base year, then 50% of these expenses for this building count towards facilities calculation:

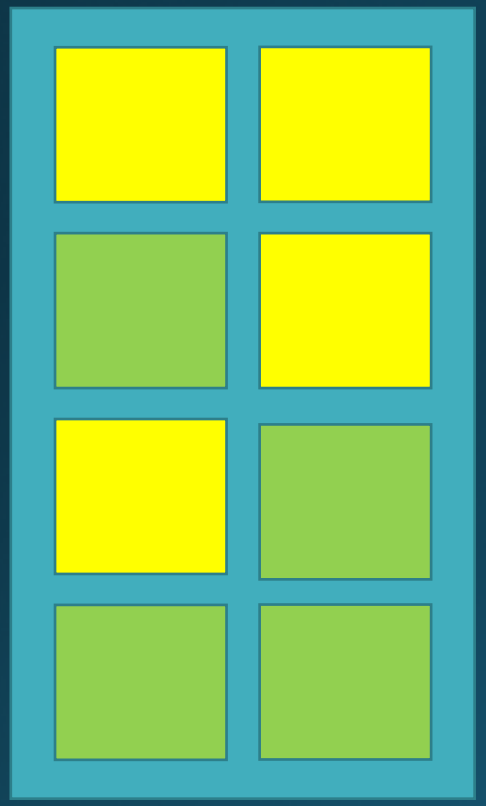
- Building and equipment depreciation
- Interest on building debt
- Operations and maintenance (From Code of Federal Regulations : janitorial and utility services; repairs and ordinary or normal alterations of buildings, furniture and equipment; care of grounds; maintenance and operation of buildings and other plant facilities; security; earthquake and disaster preparedness; environmental safety; hazardous waste disposal; property, liability and all other insurance relating to property; space and capital leasing; facility planning and management; and central receiving)

= sponsor funded research

= other (office, bathrooms)

Space connection continued…

Example building



For example, using 50%…

- $50,000 of $100,000 in building depreciation costs can be applied
- $5,000 of $10,000 hazardous waste can be applied
- $10,000 of $20,000 in energy costs can be applied
- Etc.

= sponsor funded research

= other

F&A process misses opportunities to ask for efficiency while receiving criticism for inefficiencies

F&A process lacks requests for:

- Efficient use of lab space assigned to sponsor research
- Energy efficiency and water efficiency in buildings included in overhead rate calculation

F&A process criticized for inefficiencies:

- In 2017, Trump and Price suggested 10% cap for F&A (Congress denied)
- In 2013, Obama Administration proposed creating a flat rate. Universities complained and the effort was dropped. (See this *source*).
- In 2013, European Union decided to implement a flat rate of 25% instead of negotiating rates for all grant recipients in its Horizon 2020 funding program (see *Nature* 499, 18–19; 2013)

Now is a good time to implement actions for efficiency related to F&A

Since the indirect costs (or F&A) process has been criticized over and over again for inefficiencies, it would be in the best interest of universities to implement efforts for efficiency related to overhead dollars so institutions can demonstrate to the federal government their effective and efficient use of those dollars.

- "Bringing Efficiency to Research Grants" will help meet this need.

There is a need for open communication, understanding, & team approach on the topic of F&A

Science community has concerns about overhead (F&A) rate, but are not aware of how is it calculated and how their decisions affect it.

Scientists are unaware in general that:

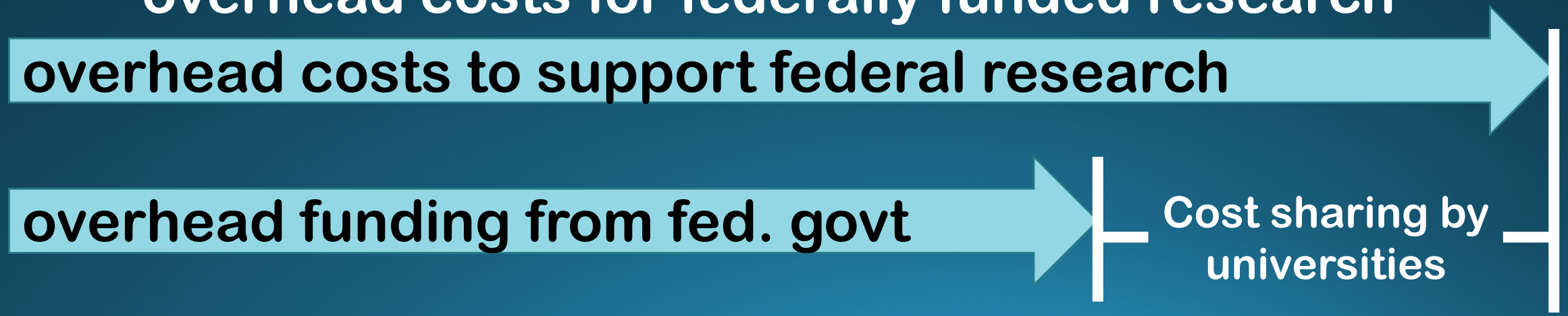
1) the administrative portion was capped at 26%
2) that the following items lead to a higher rate:
    - Inefficient space connected with sponsor funding
    - Construction of new research buildings
        - Interest on facility debt
        - Building depreciation
    - More energy consumption than necessary

Federal funding to universities for overhead costs is significant

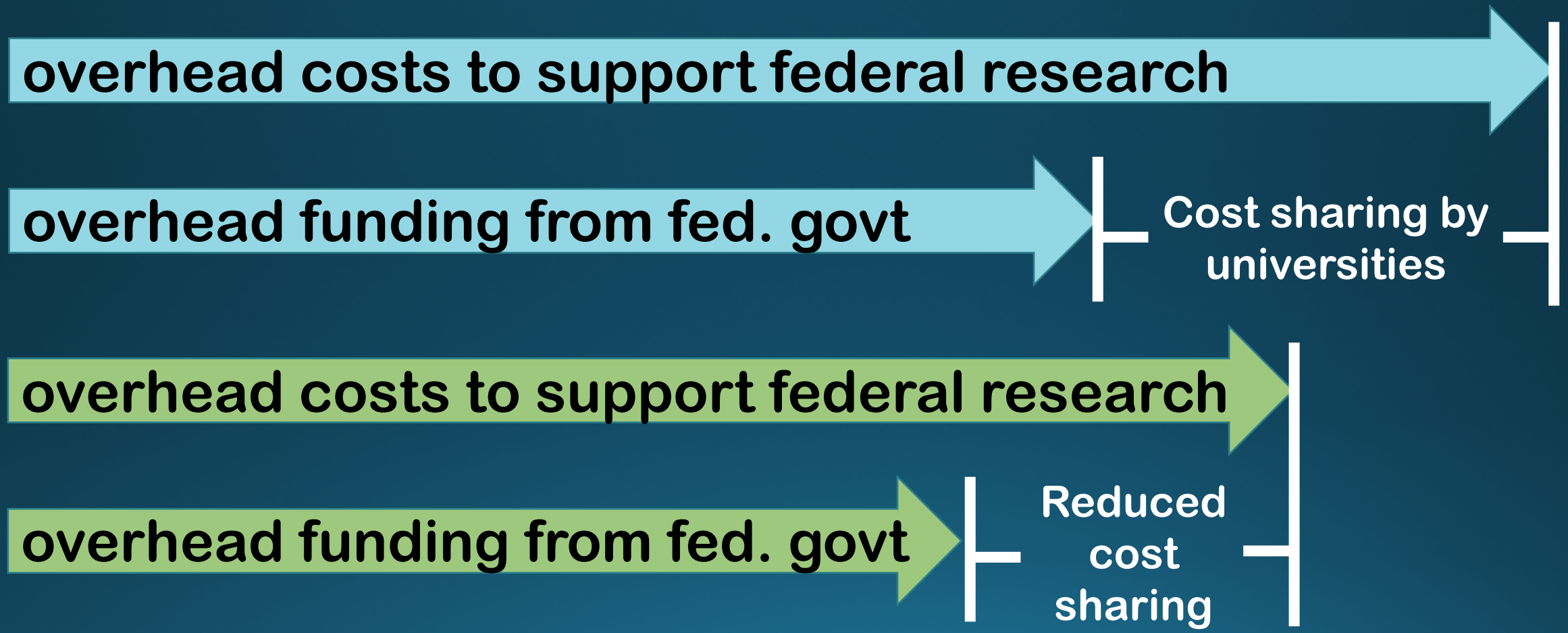
Nature 19 Nov. 2014 "Indirect costs: Keeping the lights on" http://www.nature.com/news/indirect-costs-keeping-the-lights-on-1.16376:

- 2013: $5.7 billion went to indirect costs of NIH's $22.5 billion

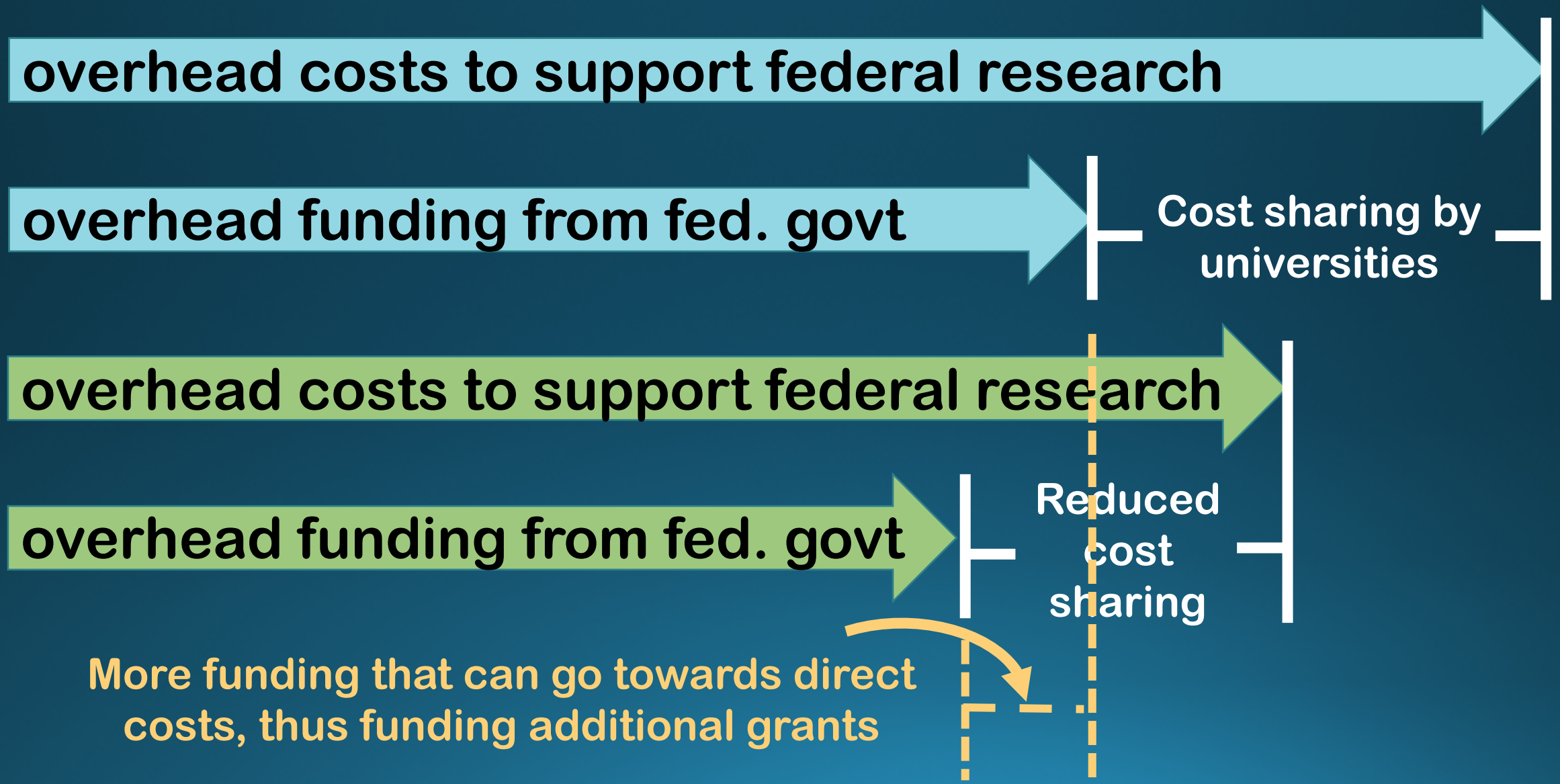
but universities report insufficient federal funding to cover overhead costs for federally funded research



What if scientists were more efficient, lessening overhead costs… could this reduce cost sharing burden?

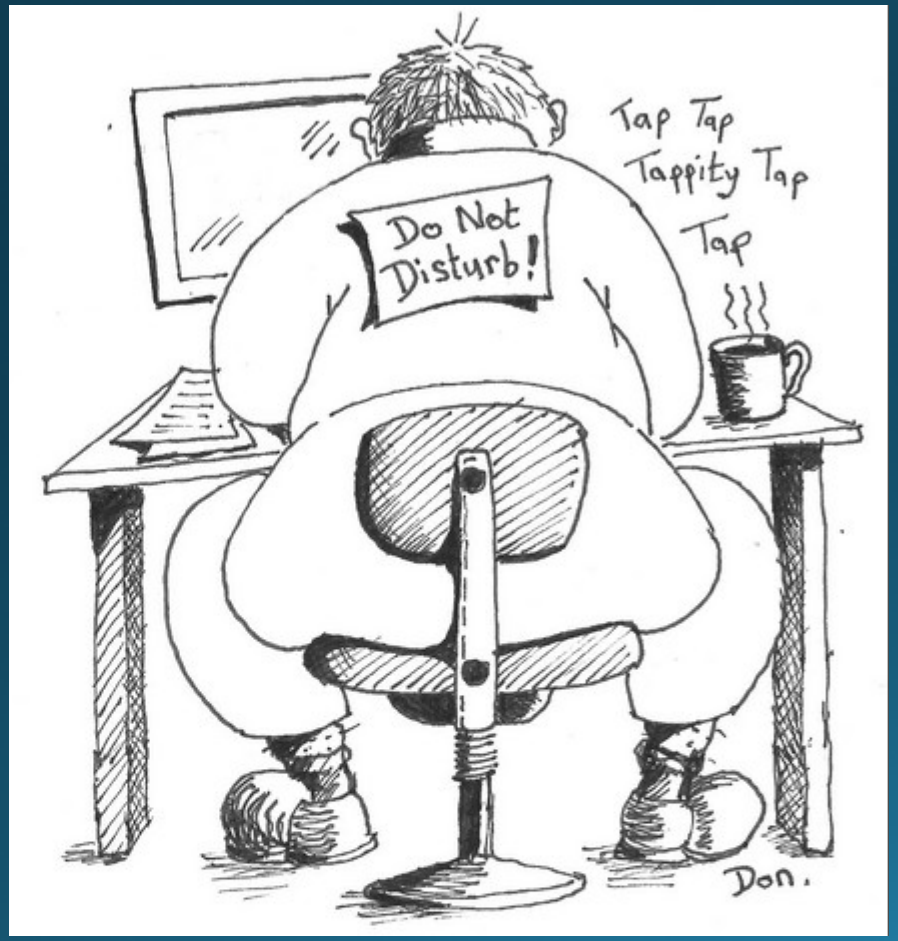


What if scientists were more efficient, lessening overhead costs… could it provide more $ for direct costs?



Inefficiencies mean a greater environmental footprint for research than necessary

Inefficiencies mean that scientists have to spend more and more time writing grants



Less time doing research

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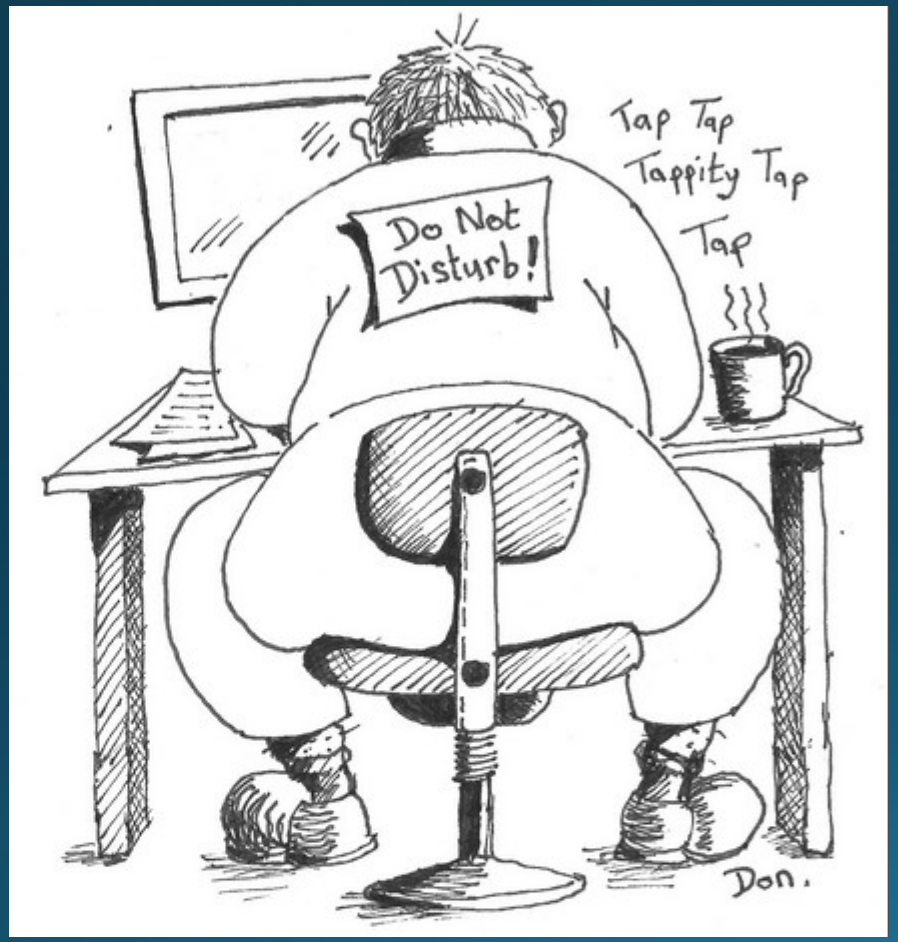
Focusing on projects that are likely to get funding

BETR Grants would improve both of these issues



BETR Grants: Are there connections to federal funding that can greatly improve?:

Equipment Sharing

Space Efficiency

Selection of Energy/Water/Material Efficient Processes & Equipment

IT resource sharing

Uniform Guidance Code of Federal Regulations (CFR) requiring equipment sharing & avoiding duplication

2 CFR 200.313 c2

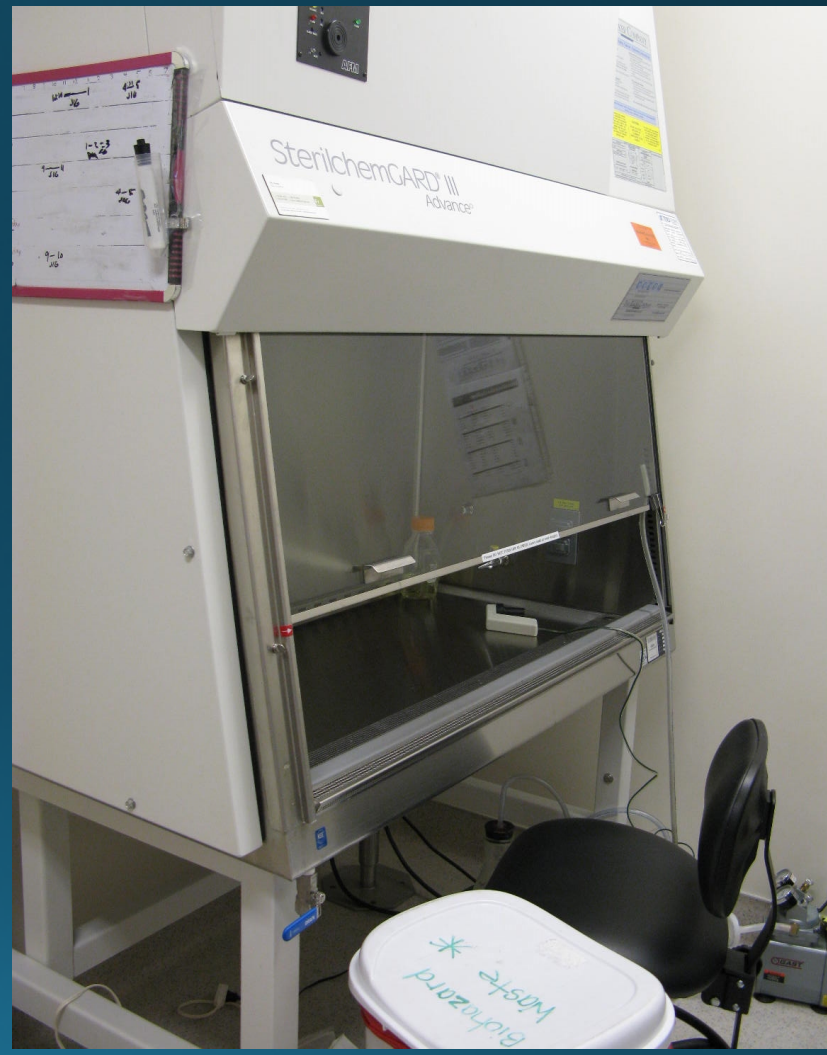
"must also make equipment available for use on other projects or programs currently or previously supported by the Federal Government, provided that such use will not interfere with the work on the projects or program for which it was originally acquired.": http://www.ecfr.gov/cgi-bin/text-idx?SID=597cf895a4e1859ccf447c54c795d4b3&node=se2.1.200_1313&rgn=div8

2 CFR 200.318 d

"must avoid acquisition of unnecessary or duplicative items" : http://www.ecfr.gov/cgi-bin/text-idx?node=2:1.1.2.2.1.4.31&rgn=div7

Managed, shared equipment in shared spaces benefits science and scientists

- Saves funding
- Saves time
- Places maintenance & training on manager
- Attracts talent & promote collaboration
- Benefits space & equipment utilization
- Managers provide expertise
- Compliance with CFRs
- In line with campus sustainability goals



Biosafety Cabinet (BSC)

How does this relate to Smart Labs Accelerator?

BETR Grants is about efficiency in the operation in labs:

- Energy efficient equipment
- Equipment sharing
- Space efficiency

➢ All have connections to energy efficiency in lab research

Key element of Smart Labs Accelerator on “occupant engagement”

- Connecting efficiency to funding will accomplish this goal

Visit new BETR Grants website: www.i2sl.org/betrgrants

- Website is resource on how to include efficiency in grant proposals
- UC Santa Barbara - already taking action
- NSF “Broader Impacts” section could include how efficiency in labs contributes to broader campus sustainability goals
- Feedback received – it’s a good idea!
- Early adopters will be seen as leaders

QUESTIONS?

Contact Information:

Kathy Ramirez-Aguilar, Ph.D.
CU Green Labs Program
kramirez@colorado.edu