



REPUBLIC OF THE PHILIPPINES
NATIONAL ECONOMIC AND
DEVELOPMENT AUTHORITY



M&E FORUM WEBINAR 10

Data Visualization

Evidence-based Policy and Decision-making

November 24, 2021

Erika Fille T. Legara, PhD
Aboitiz Chair in Data Science
Asian Institute of Management

What are
data visualizations
for?



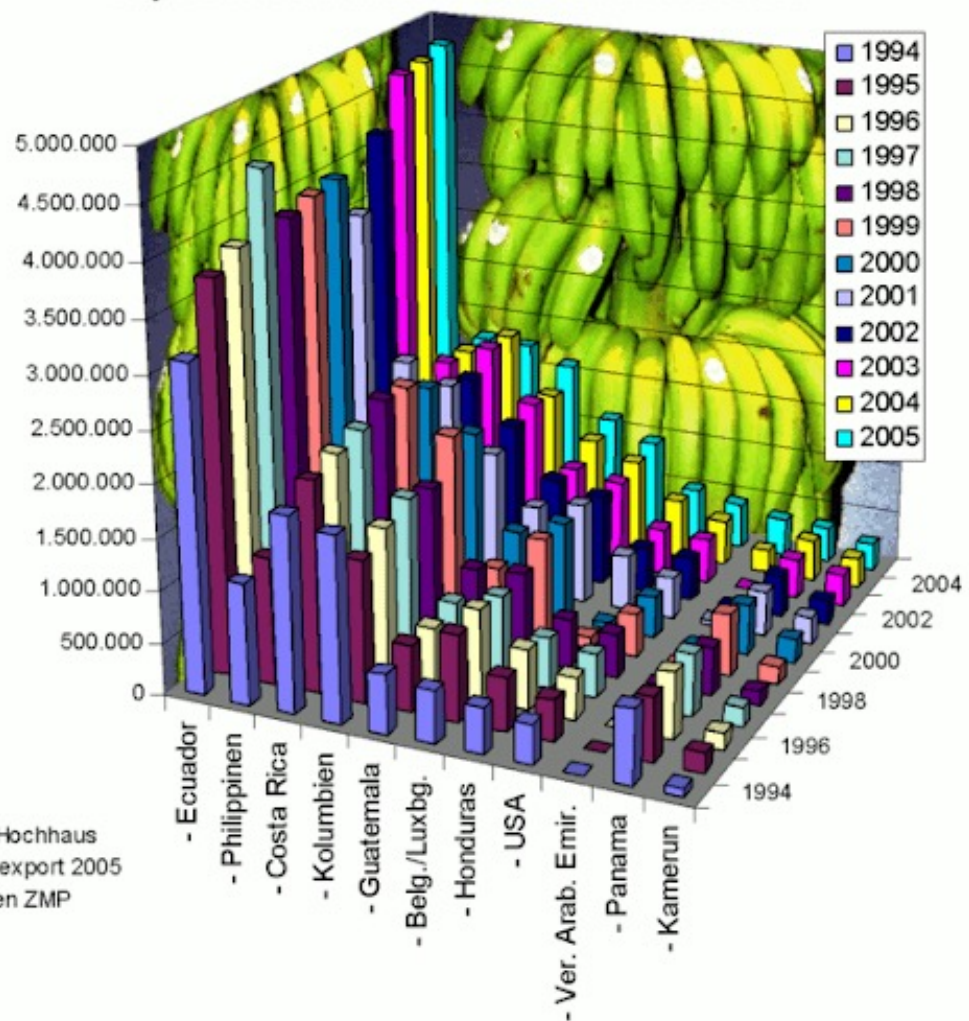
Google Search

I'm Feeling Lucky

Google offered in: [Filipino](#) [Cebuano](#)

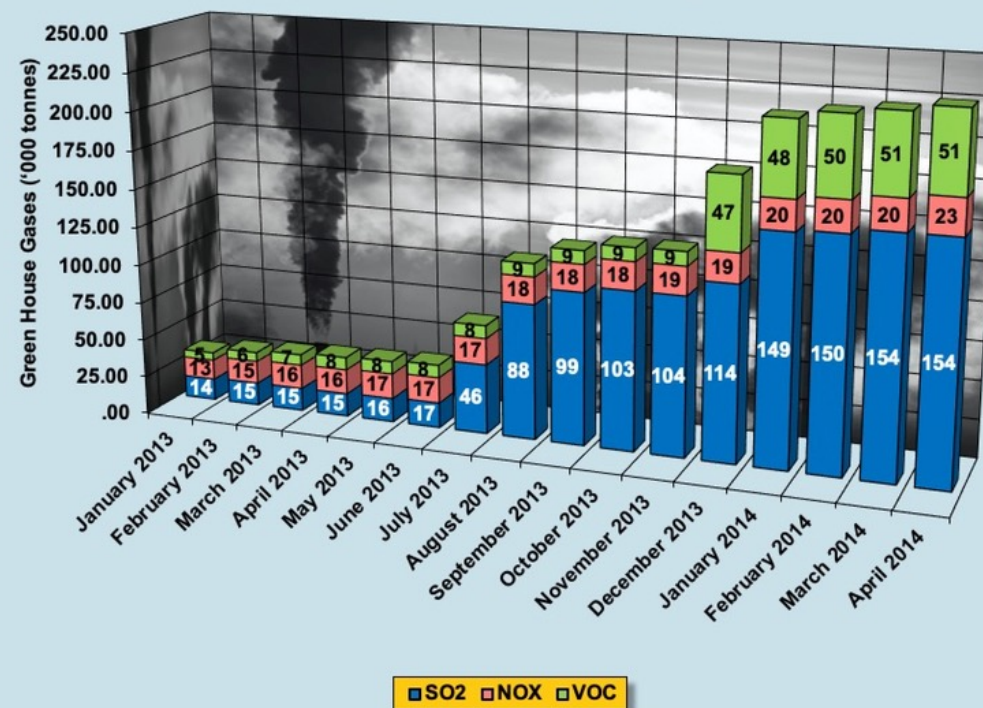
Bad graphs are everywhere.

Export von Bananen in Tonnen von 1994-2005

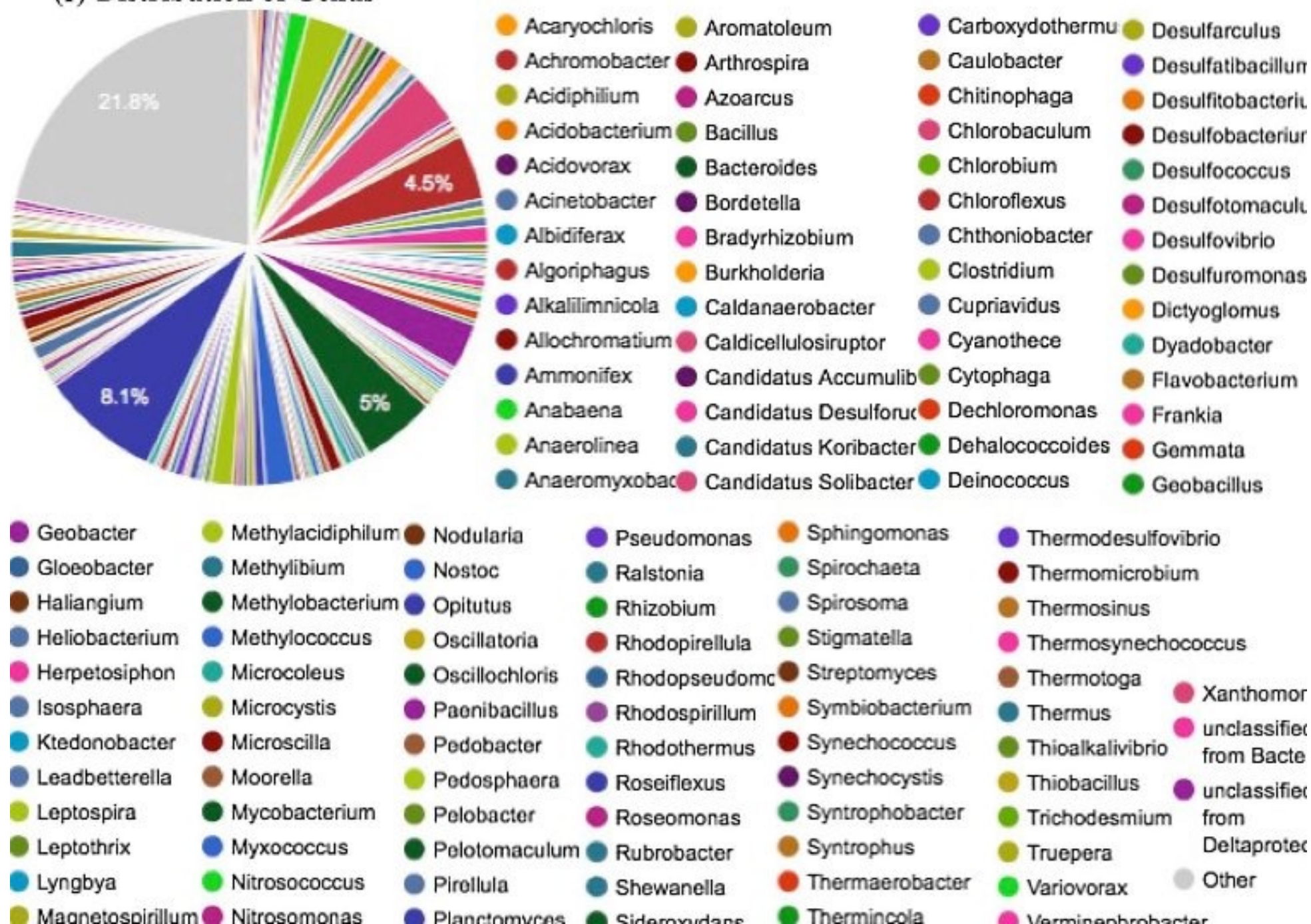


Dr. Hochhaus
Banexport 2005
Daten ZMP

Emissions of Green House Gases



(f) Distribution of Genus

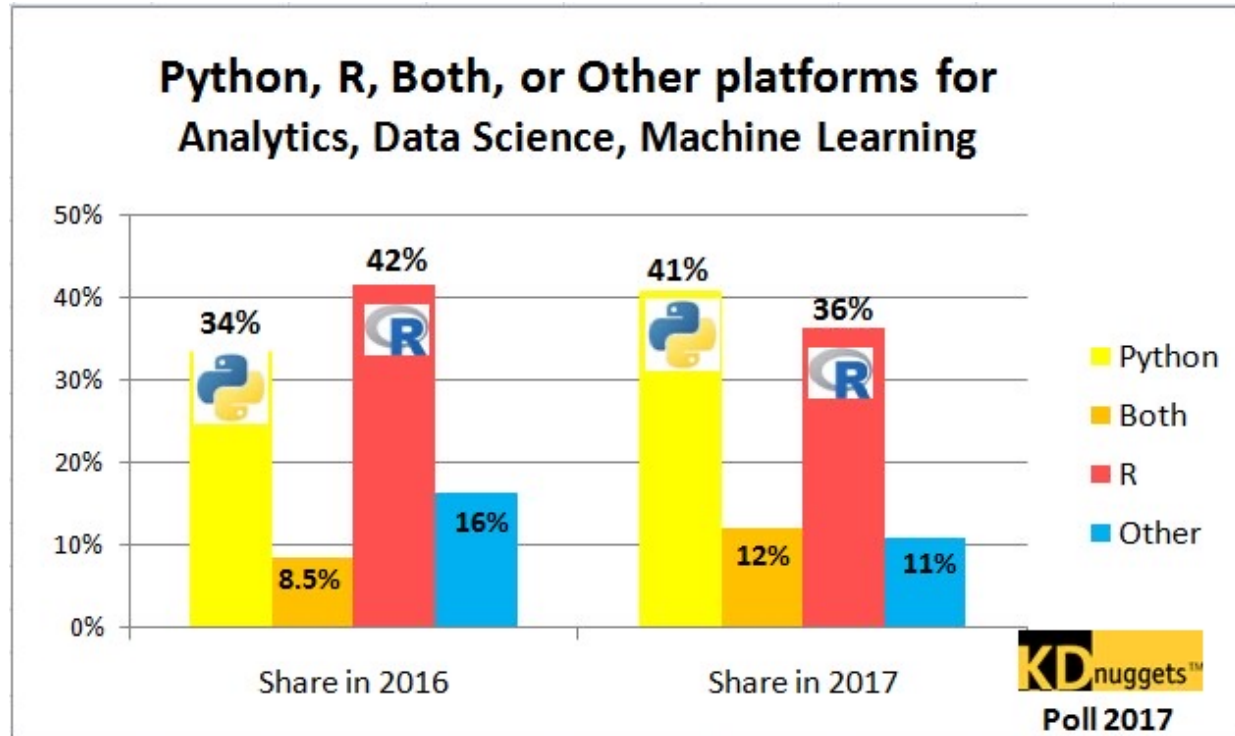
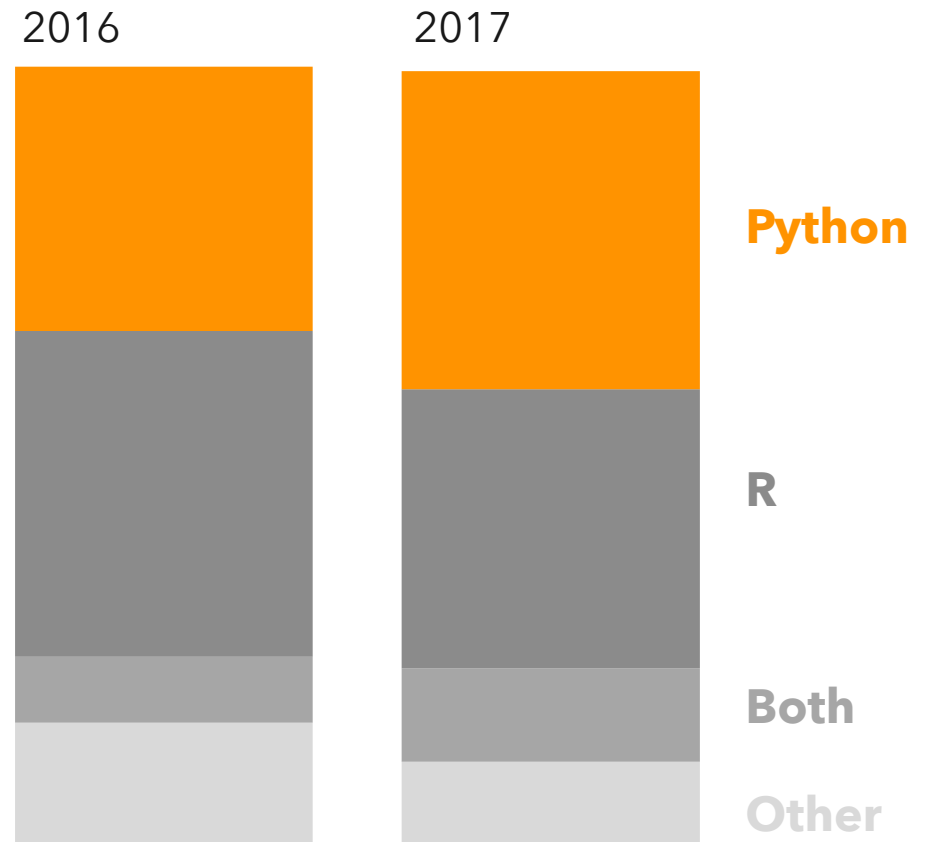


What are
data visualizations
for?

PYTHON GAINS, R WANES

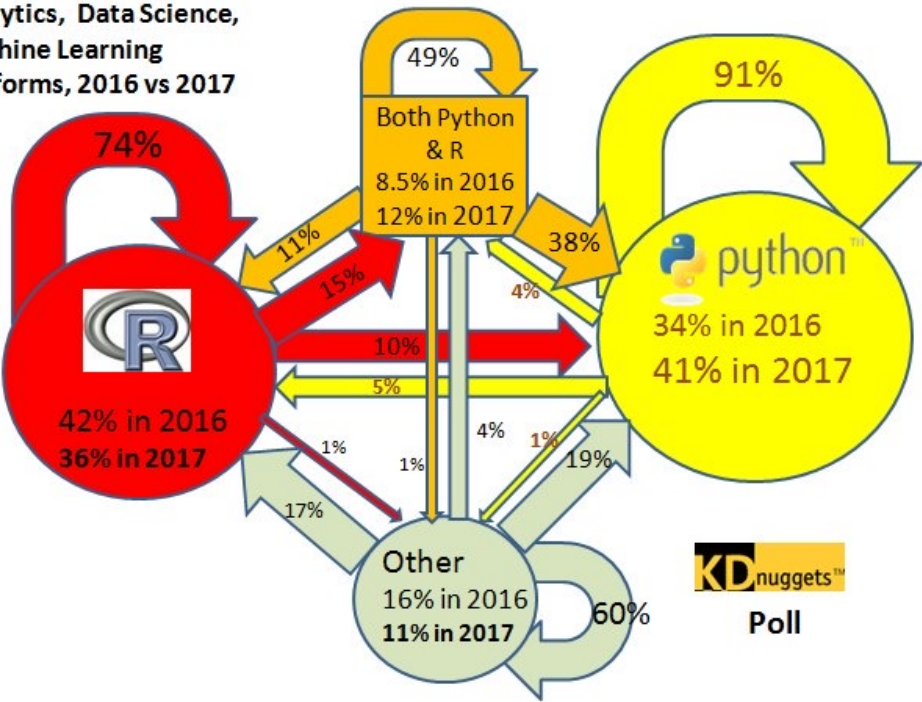
Data scientists are flocking to Python

USAGE SHARE



Data Source: KDNUGGETS

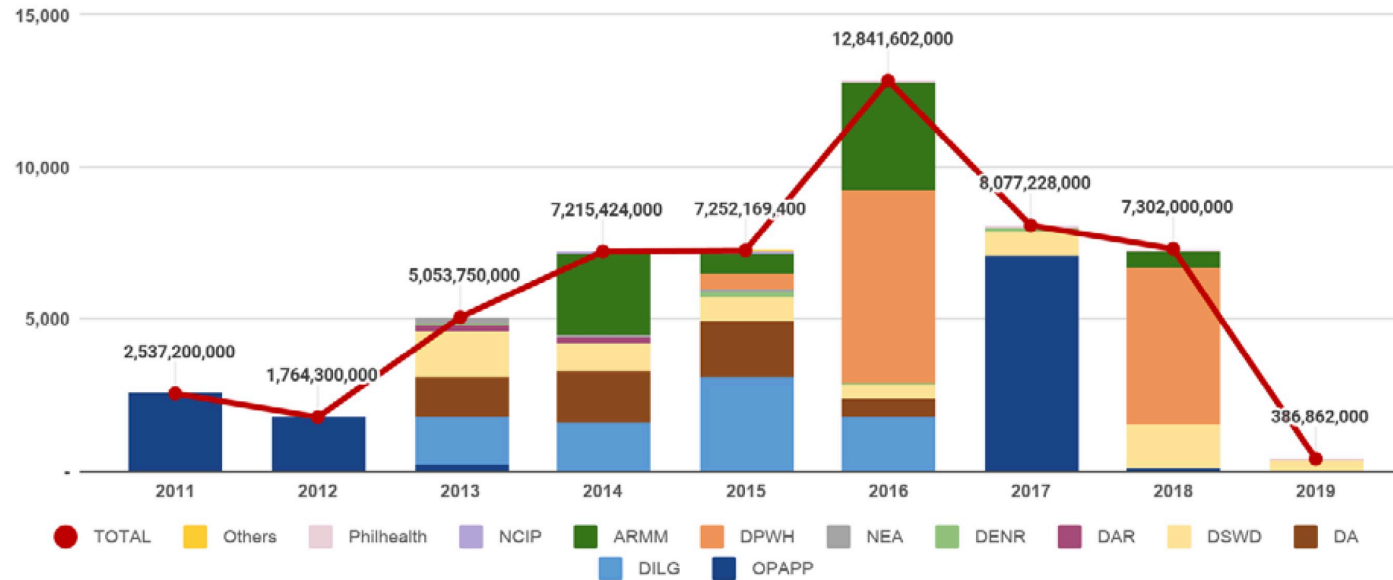
Analytics, Data Science,
Machine Learning
Platforms, 2016 vs 2017



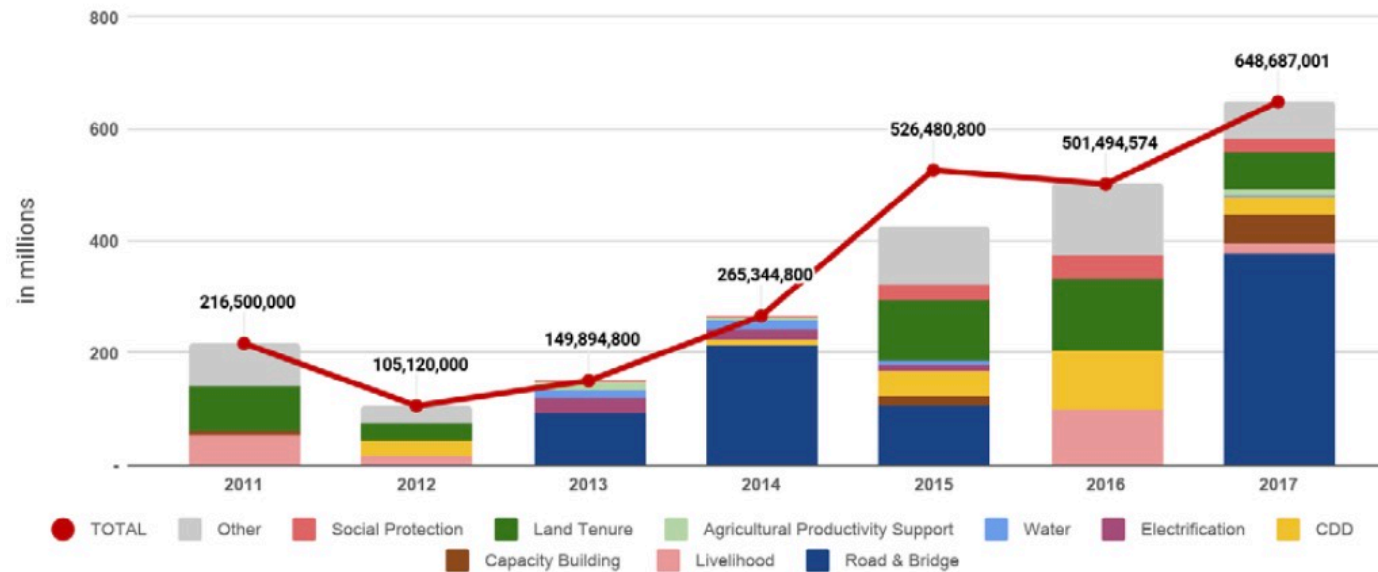
Data Source: KDNUGGETS



PAMANA Appropriations



PAMANA Expenditures by Project Type (RPA)



Evaluation of the Payapa and Masaganang Pamayanan (PAMANA) Program, Innovations for Poverty Action, 20 Nov 2019

FOUR IDEAS

We don't go in order.

We see first what stands out.

We see only a few things at once.

We seek meaning and make connections.

Good Charts by Scott Berinato





Colors can guide your audience on **where to look.**

4 8 1 3 4 1 7 5

1 3 5 2 3 8 9 6

4 1 6 5 7 4 1 7

9 5 7 2 6 2 1 5

4 8 1 3 4 1 7 5

1 3 5 2 3 8 9 6

4 1 6 5 7 4 1 7

9 5 7 2 6 2 1 5

And you will read this last

**You will read
this first**

And then you will read this

Then this one

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Waiting Times at Each Bank Branch

(The data here is hypothetical)

Minutes

125

100

75

50

25

0

10:00 AM

12:00 PM

2:00 PM

4:00 PM

- Branch 1
- Branch 2
- Branch 3
- Branch 4
- Branch 5
- Branch 6
- Branch 7
- Branch 8
- Branch 9
- Branch 10

Waiting Times at Each Bank Branch

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Minutes

125

100

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0

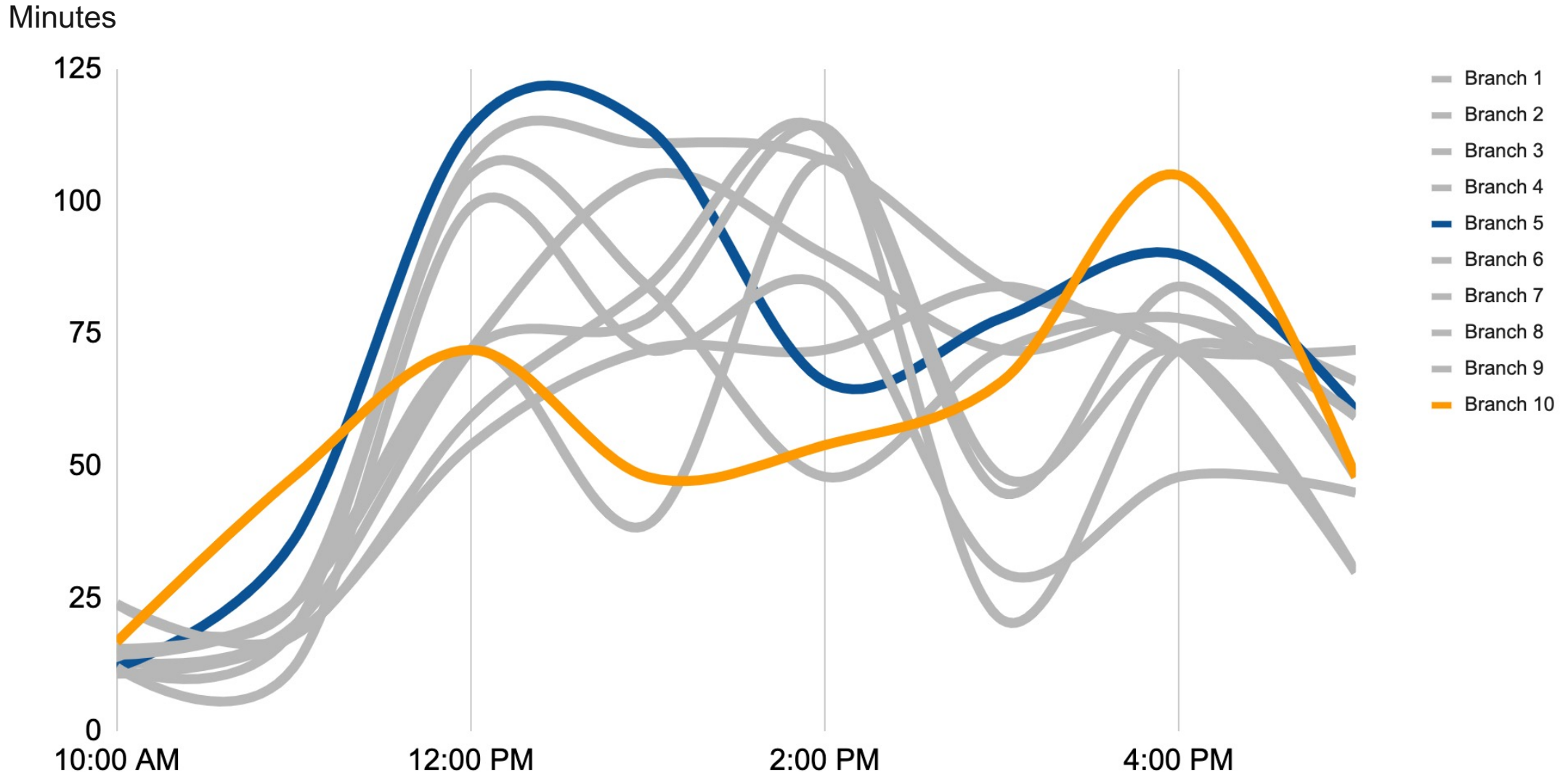
10:00 AM

12:00 PM

2:00 PM

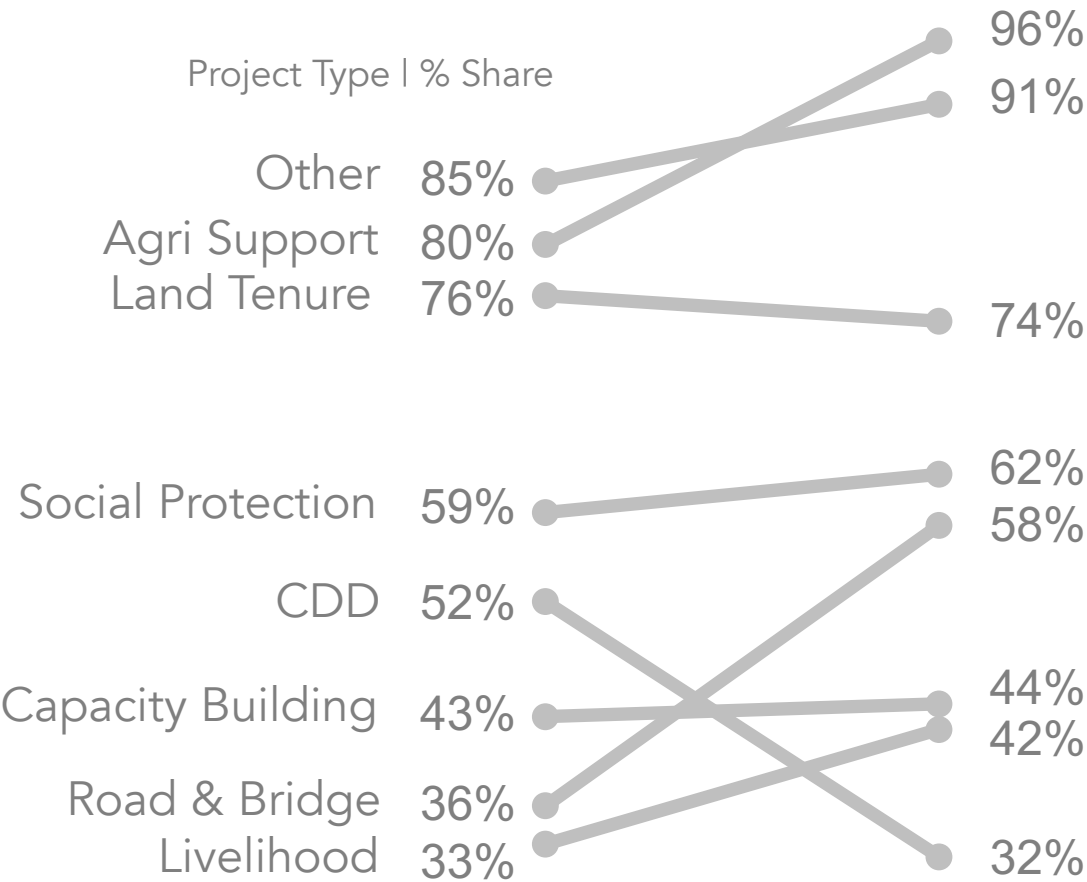
4:00 PM

- Branch 1
- Branch 2
- Branch 3
- Branch 4
- Branch 5
- Branch 6
- Branch 7
- Branch 8
- Branch 9
- Branch 10



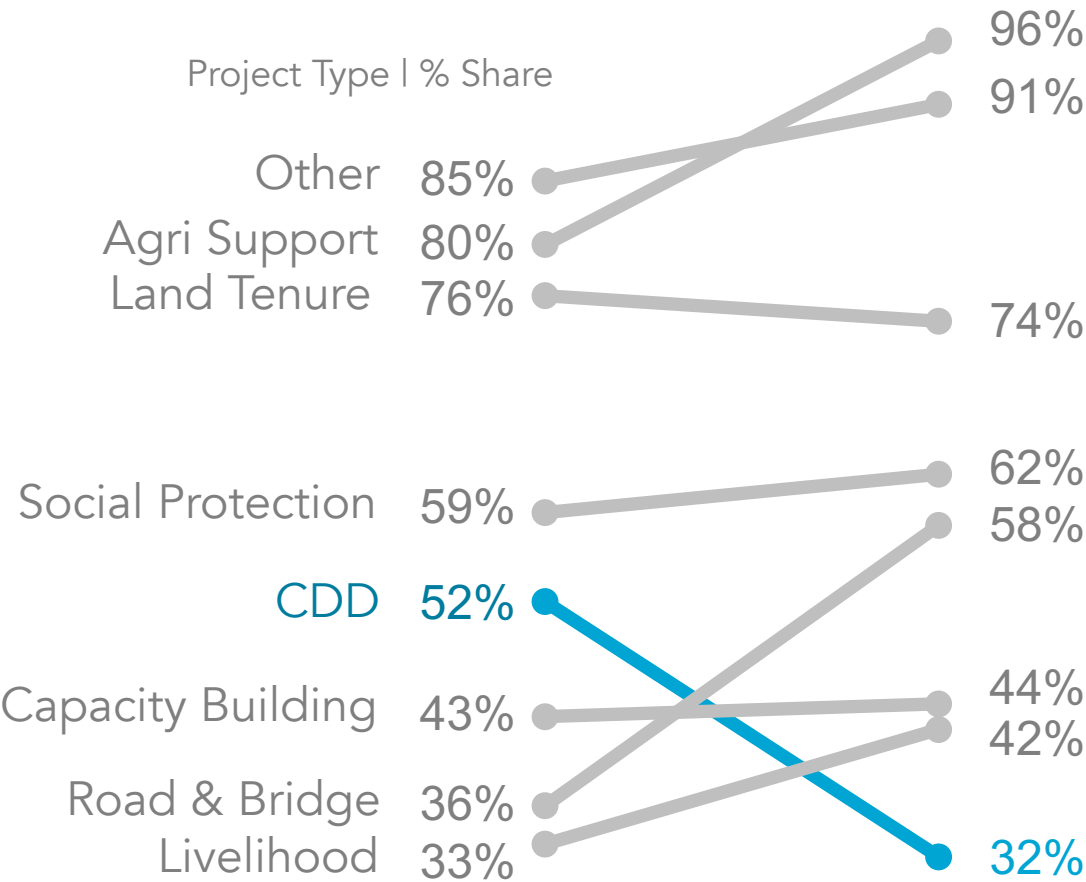
BARAHA Expenditures (2029-2030)

(These are all made up numbers for illustration)



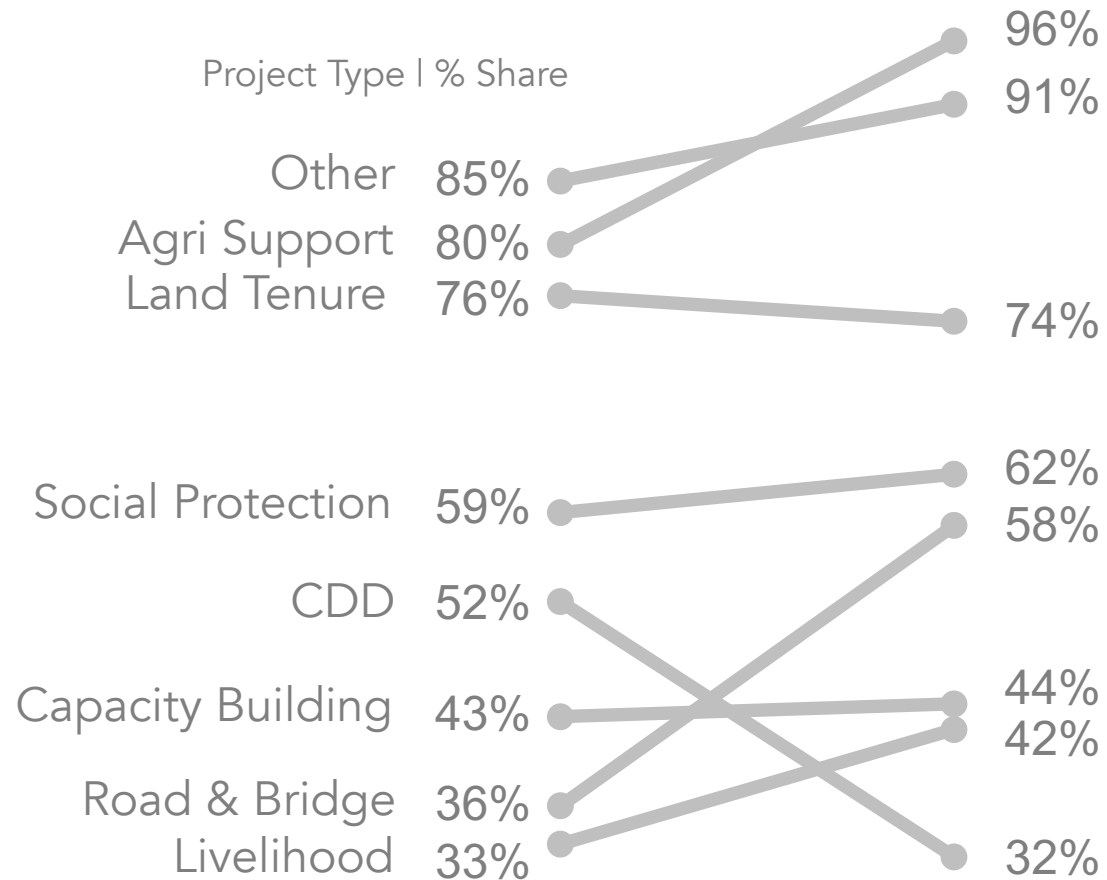
BARAHA Expenditures (2029-2030)

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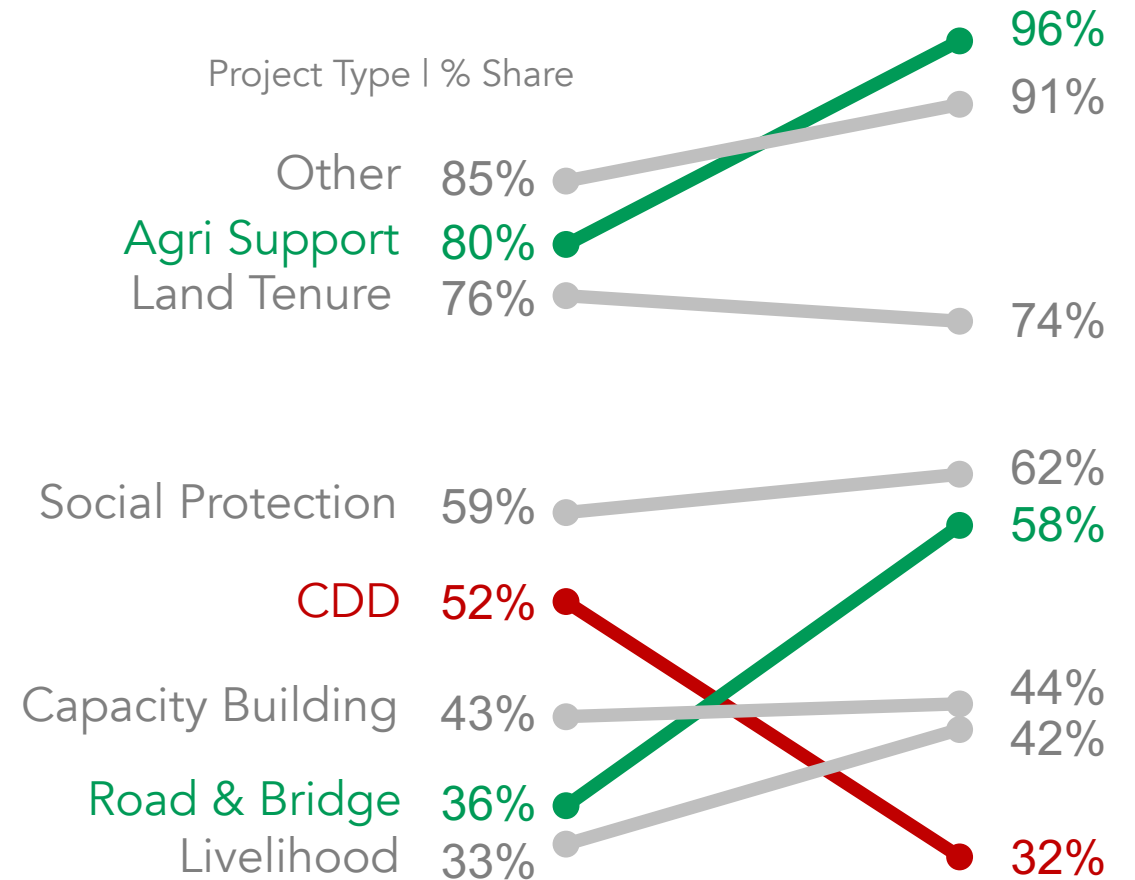
BARAHA Expenditures (2029-2030)

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| CLOSURE

The brain is good at filling in gaps to create a whole.

| PROXIMITY

Objects that are close together will be grouped together visually.

| SIMILARITY

Two items that share attributes will be visually grouped together.

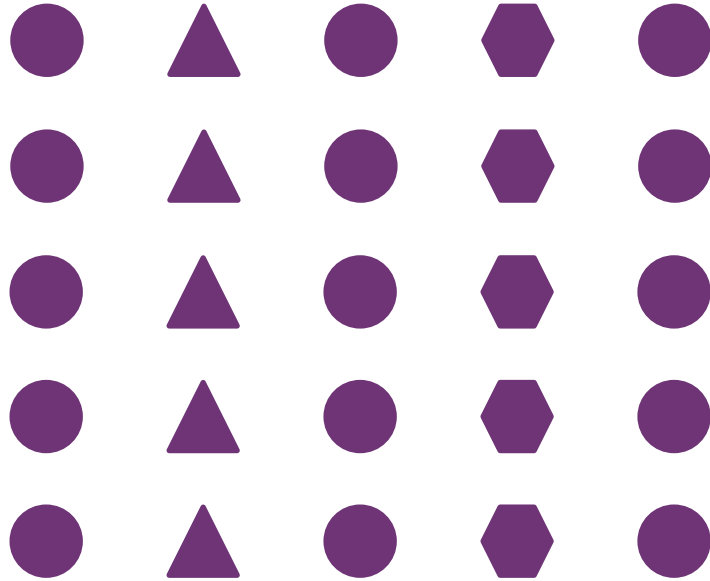
| CONTINUATION

A line will always appear to continue travelling in the same way.

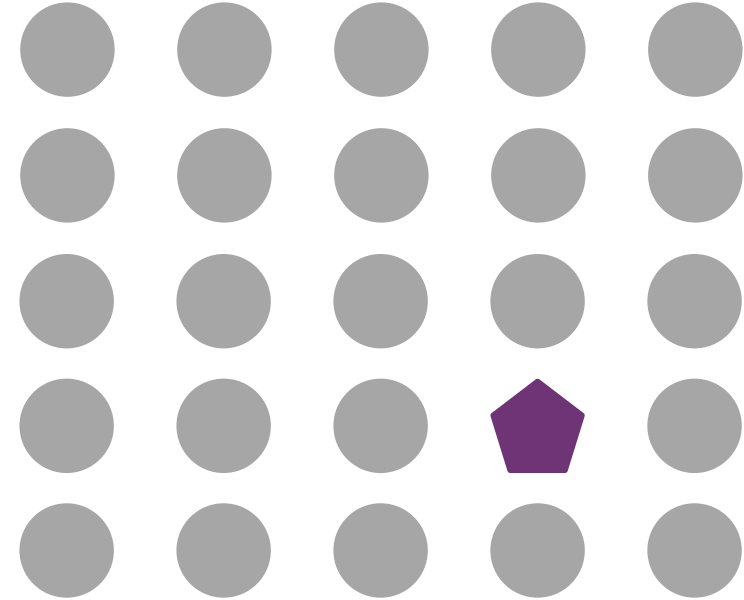
| FIGURE & GROUND

Sometimes, the blank space is just as important as the field of space.

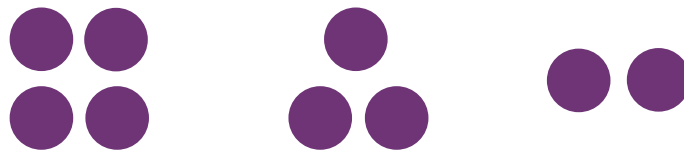
LAW OF SIMILARITY



LAW OF FOCAL POINT



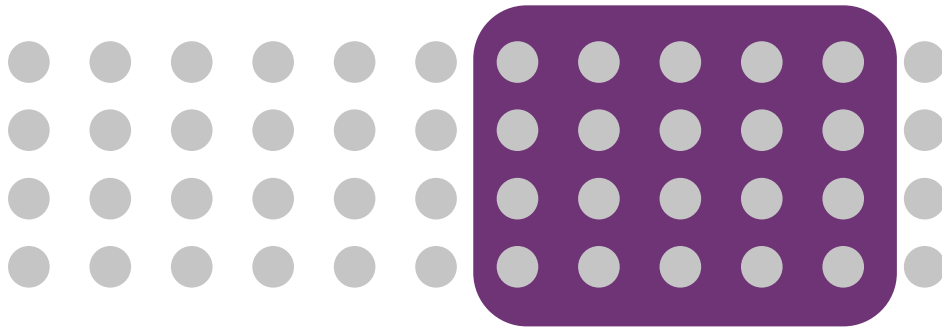
LAW OF PROXIMITY



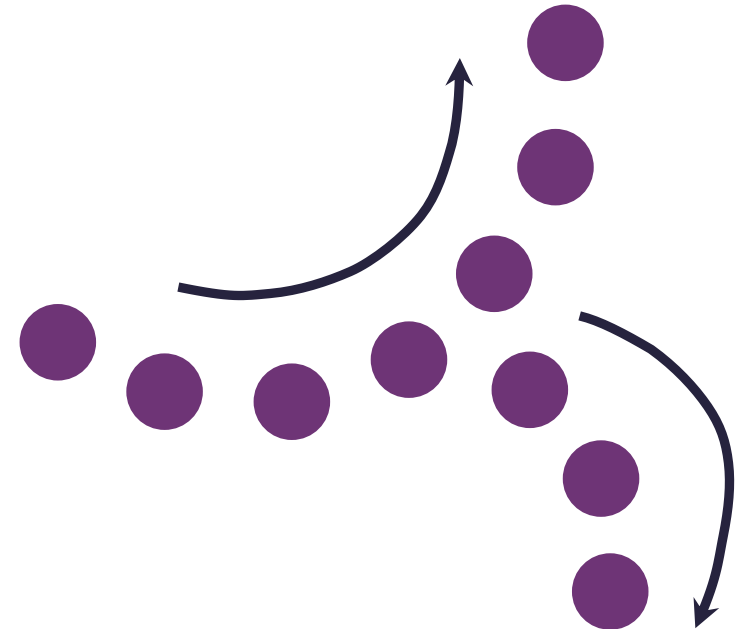
LAW OF CLOSURE



LAW OF COMMON REGION

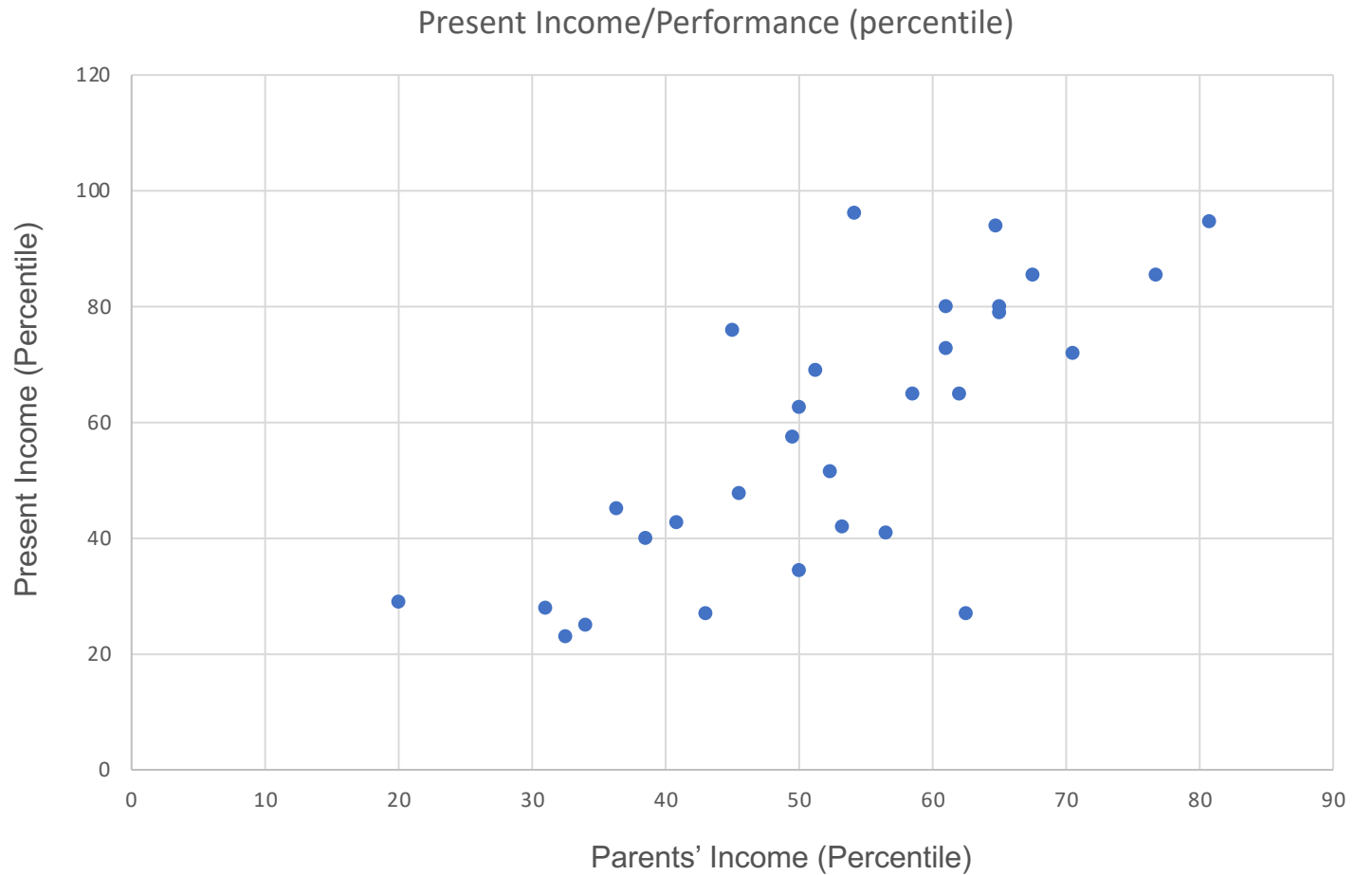
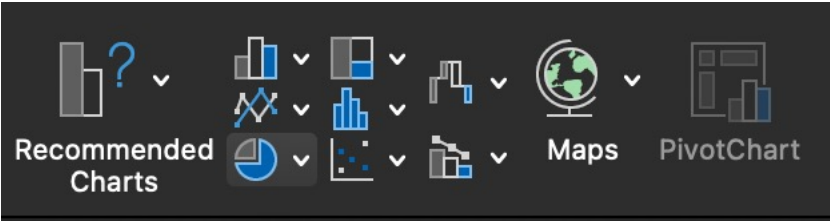


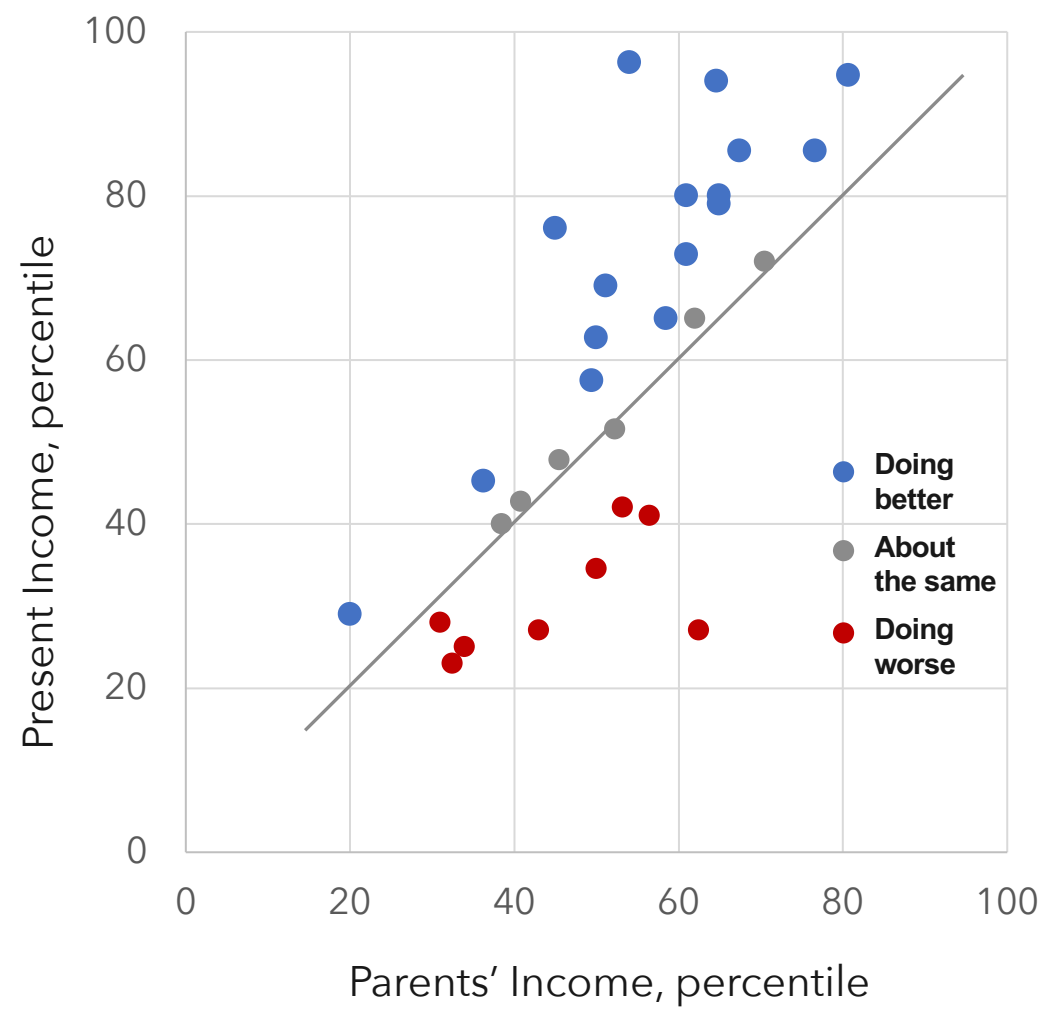
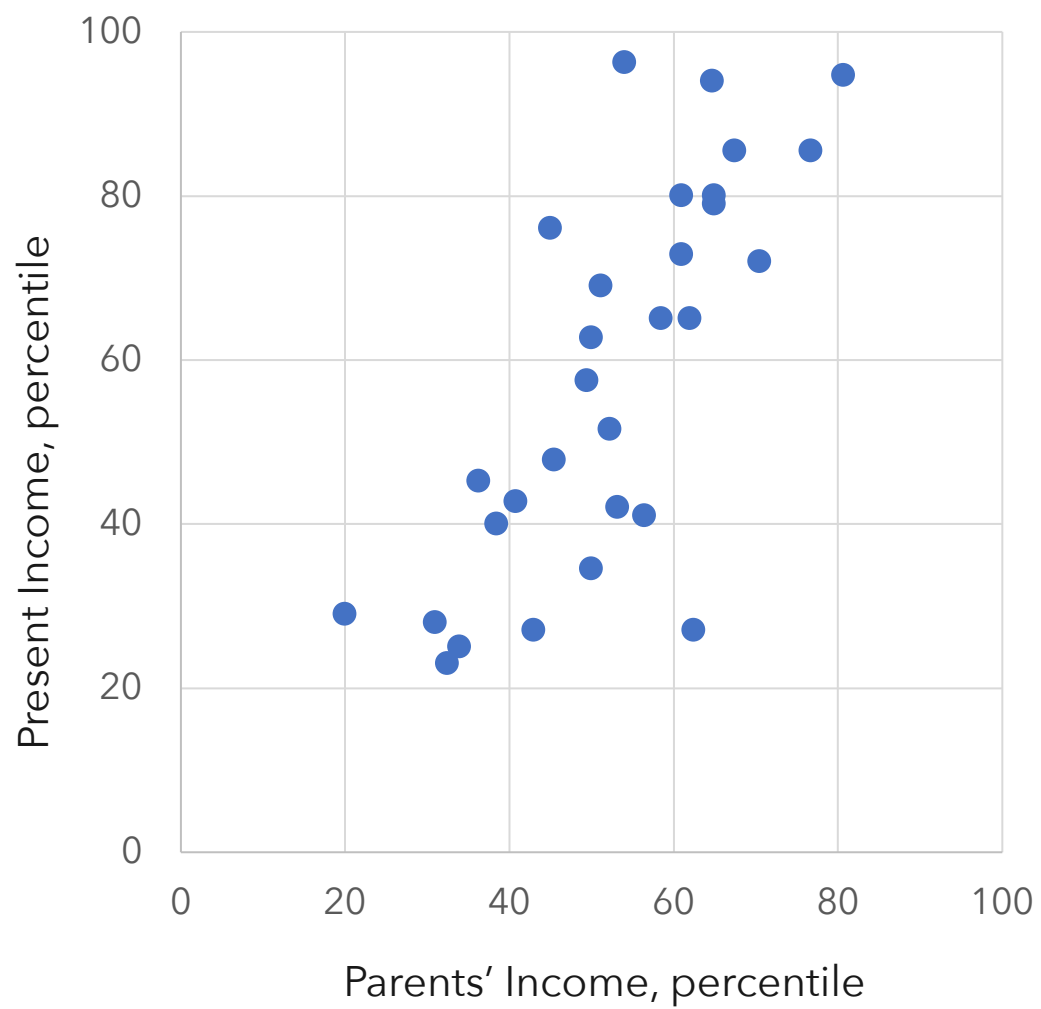
LAW OF CONTINUITY



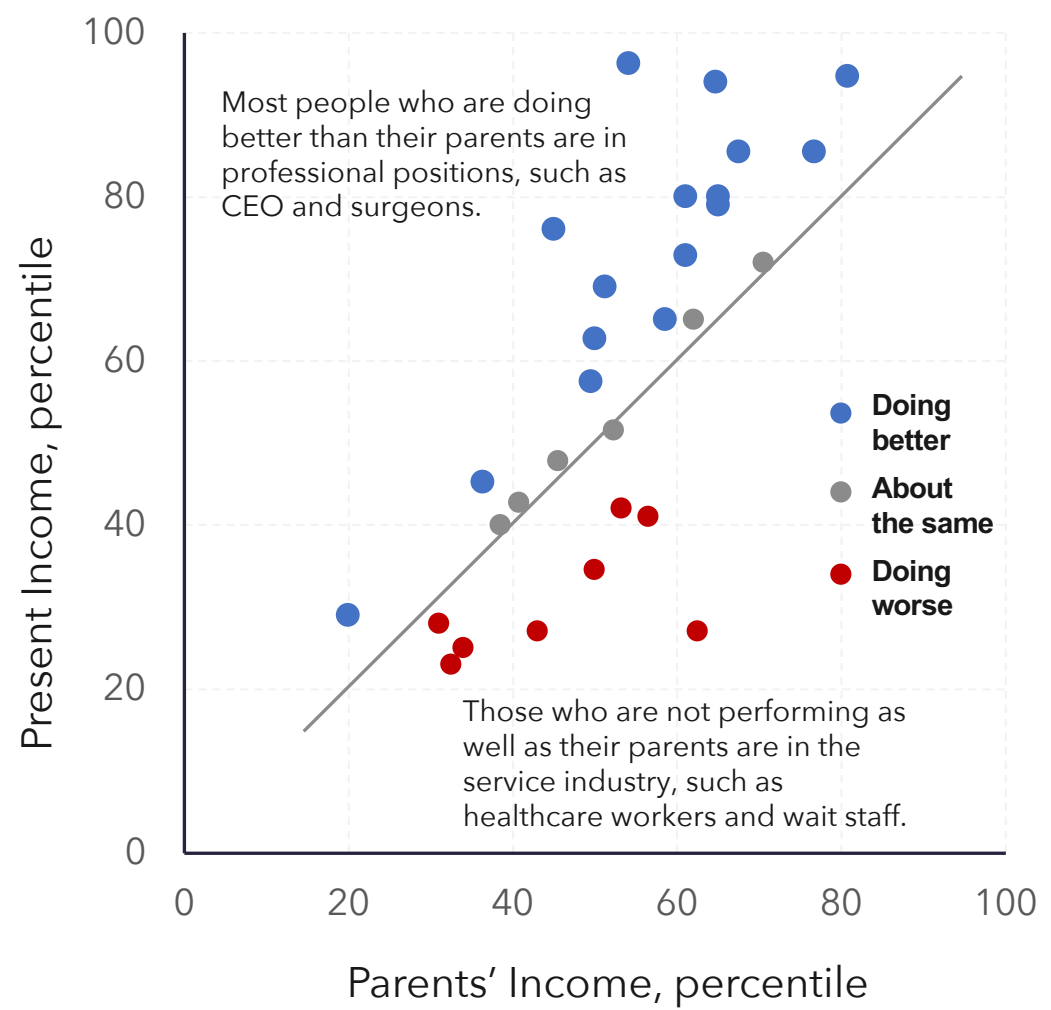
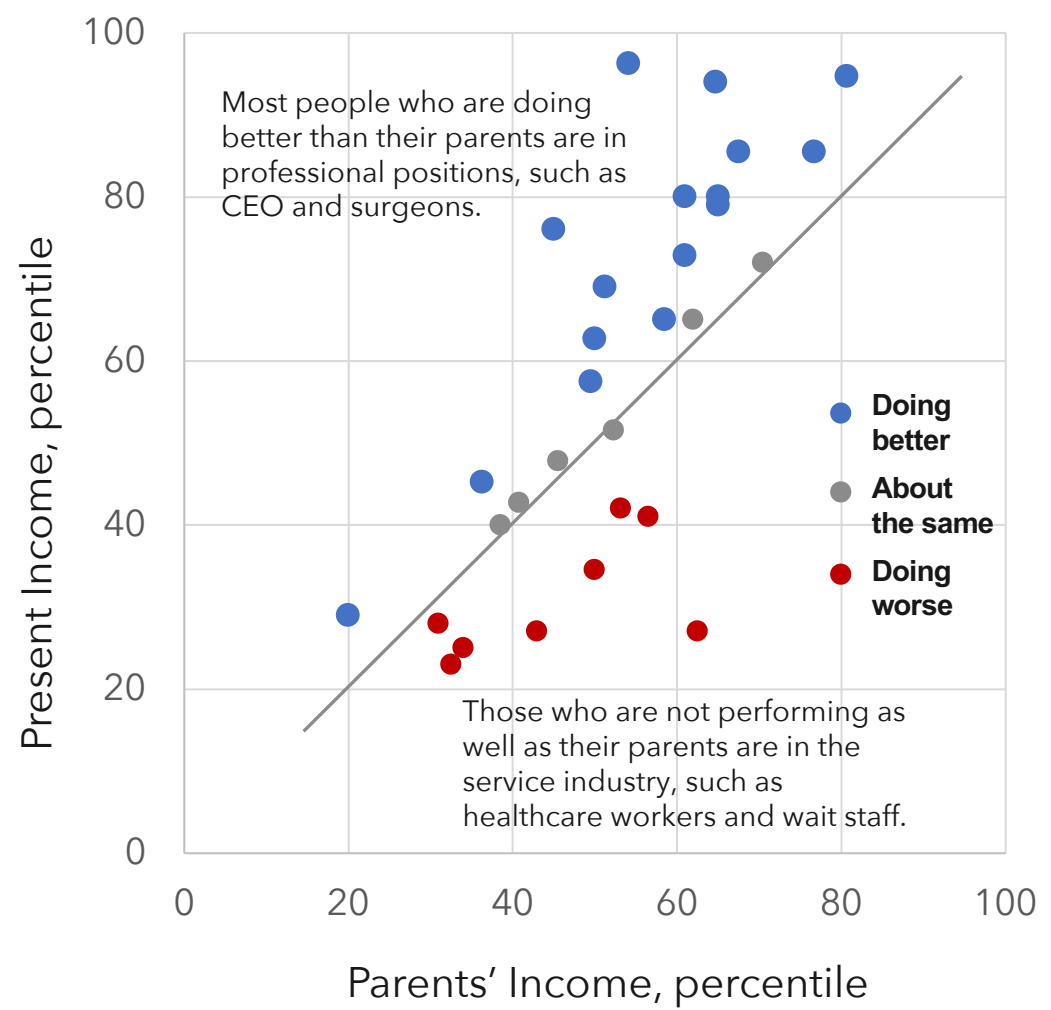
CASE 1

	A	B	C
1	Parents' Income/Performance (percentile)	Present Income/Performance (percentile)	Nature of work
2	20	29	Farming, fishing, and forestry
3	31	28	Janitors, maids, etc.
4	32.5	23	Childcare workers
5	34	25	Food preparation occupations
6	43	27	Waiters and servers
7	50	34.5	Archivists, curators, and librarians
8	53.2	42	Sales and related
9	56.5	41	Secretaries and admin assistants
10	62.5	27	Designers, musicians, artists, etc.
11	38.5	40	Construction
12	40.8	42.7	Machinists, welders, etc.
13	45.5	47.8	Factory assembly
14	52.3	51.5	Counselors, social, and religious workers
15	62	65	Media and communications workers
16	70.5	72	Physical, life and social scientists
17	76.7	85.5	Financial analysts and advisers
18	36.3	45.2	Truck drivers, heavy equipment operators, etc.
19	49.5	57.5	Mechanics, repairmen, etc.
20	50	62.65	Human resources, etc.
21	51.2	69	Nurses
22	45	76	Police officers and firefighters
23	58.5	65	Teachers
24	61	72.8	Accountants and auditors
25	61	80	Computer programmers
26	65	79	Managers
27	65	80	Engineers, architects, and surveyors
28	67.5	85.5	Legal Support Workers
29	54.1	96.2	Doctors, dentists, surgeons
30	64.7	94	Chief executives
31	80.7	94.7	Lawyers and judges
32			



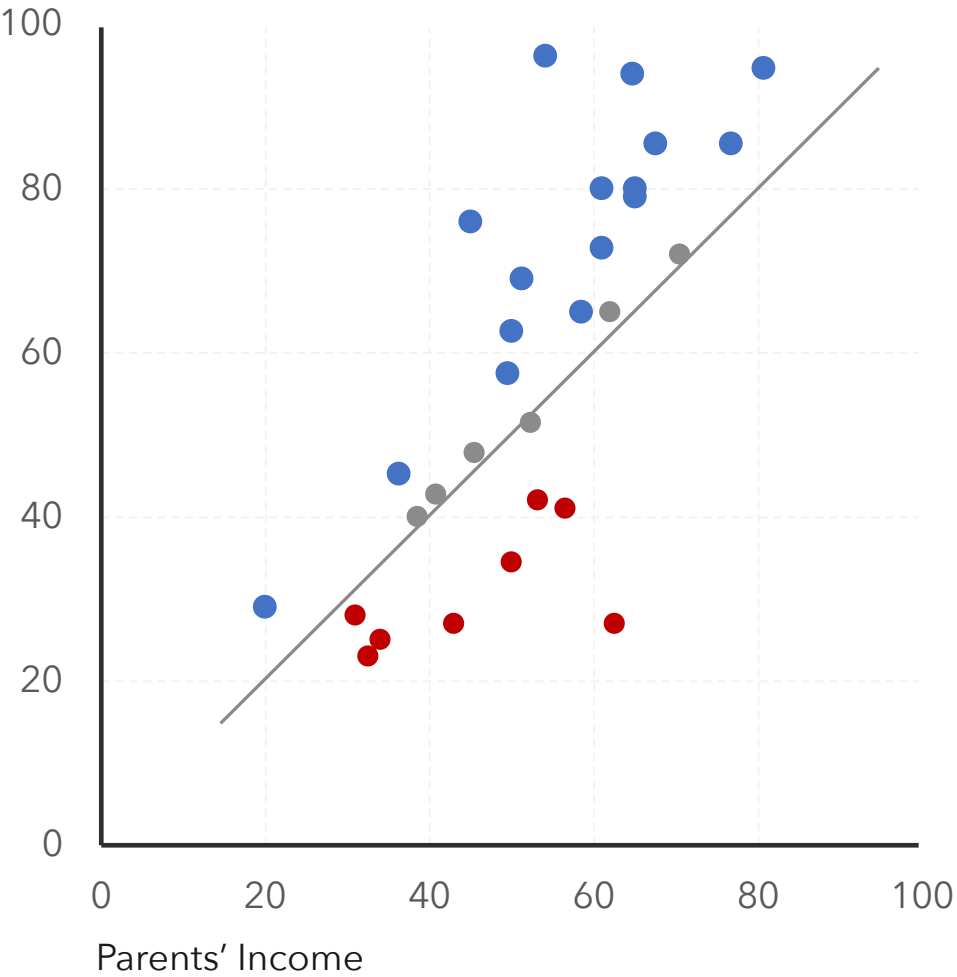


WHO'S DOING BETTER THAN THEIR PARENTS?



WHO'S DOING BETTER THAN THEIR PARENTS?

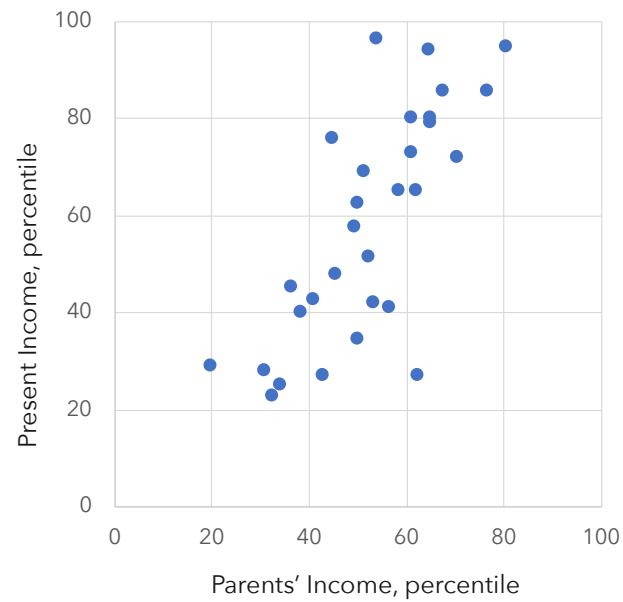
Present Income Percentile



Professionals, including executives, surgeons, and lawyers, do **BETTER** than their parents.

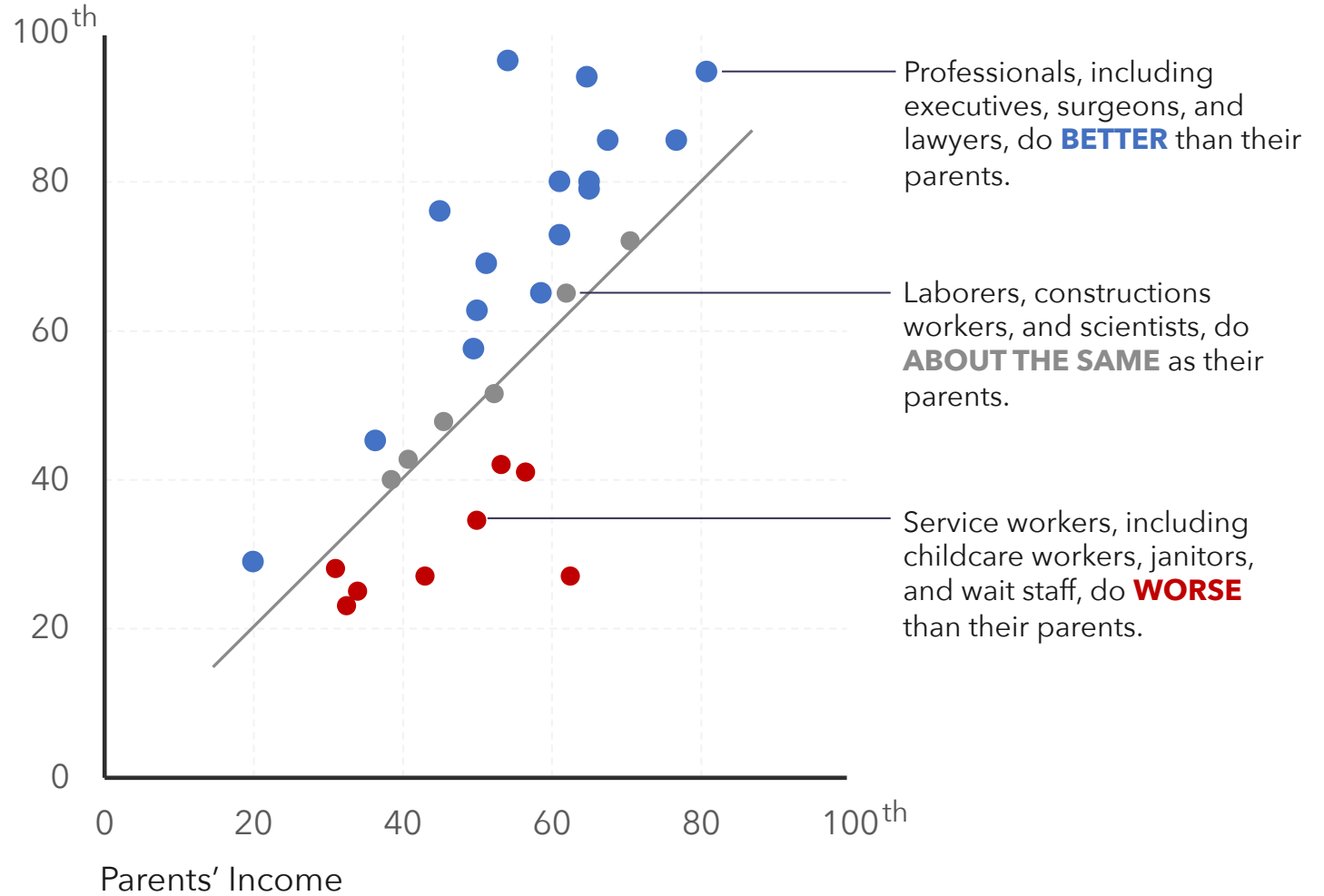
Laborers, constructions workers, and scientists, do **ABOUT THE SAME** as their parents.

Service workers, including childcare workers, janitors, and wait staff, do **WORSE** than their parents.



WHO'S DOING BETTER THAN THEIR PARENTS?

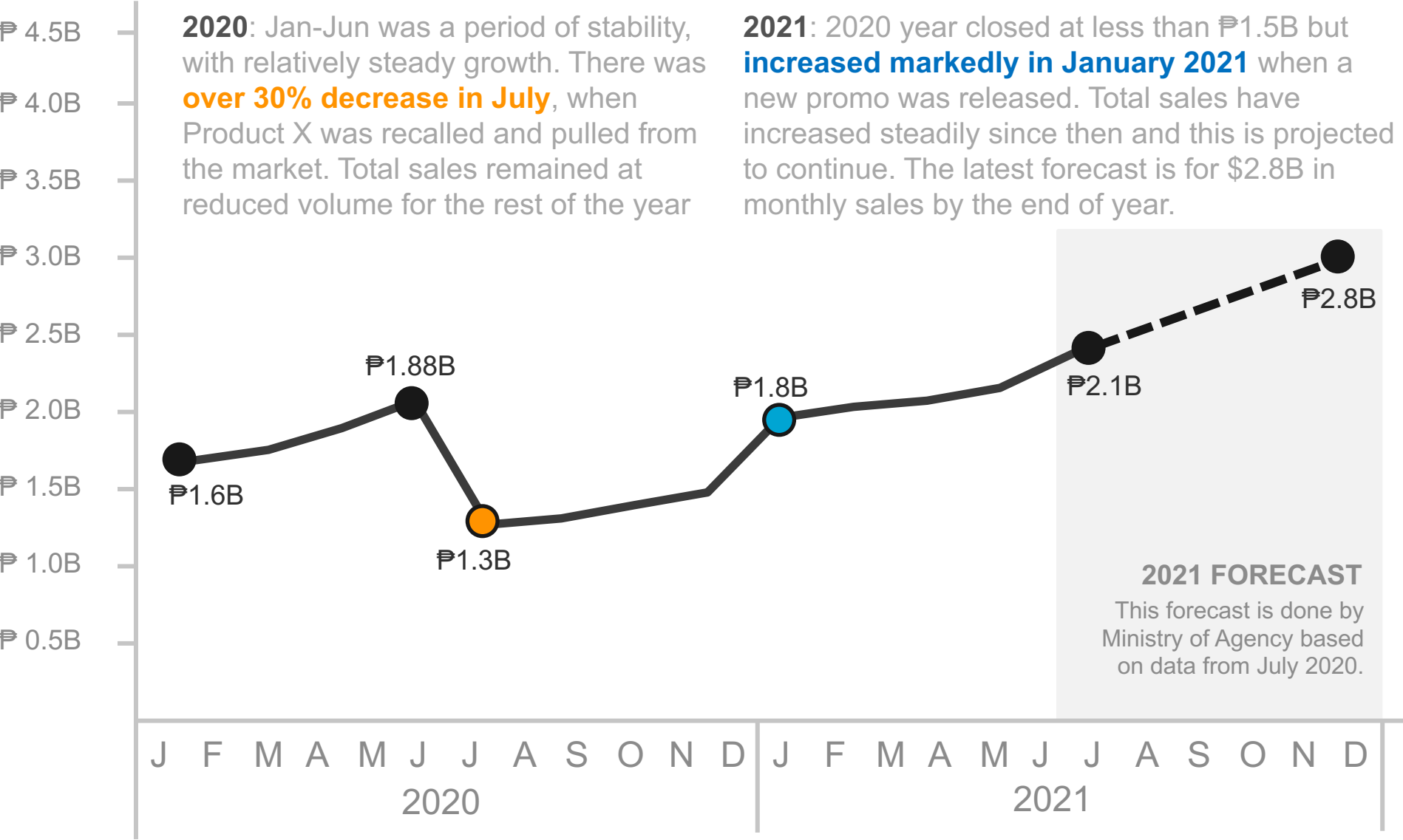
Present Income Percentile



CASE 2

MARKET SIZE AT ₱2.8B BY DECEMBER 2021

SALES



CASE 3

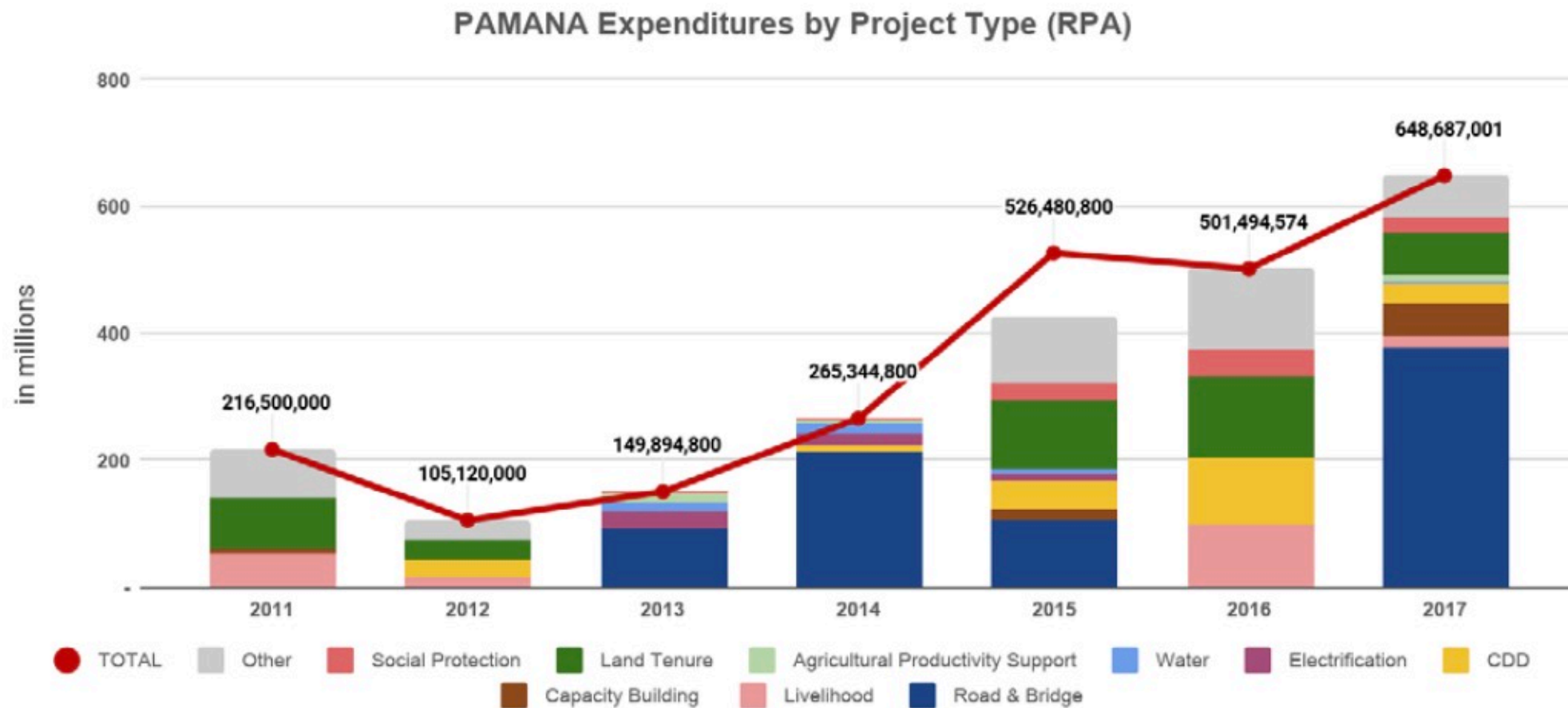
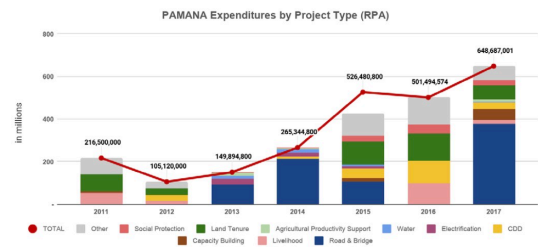
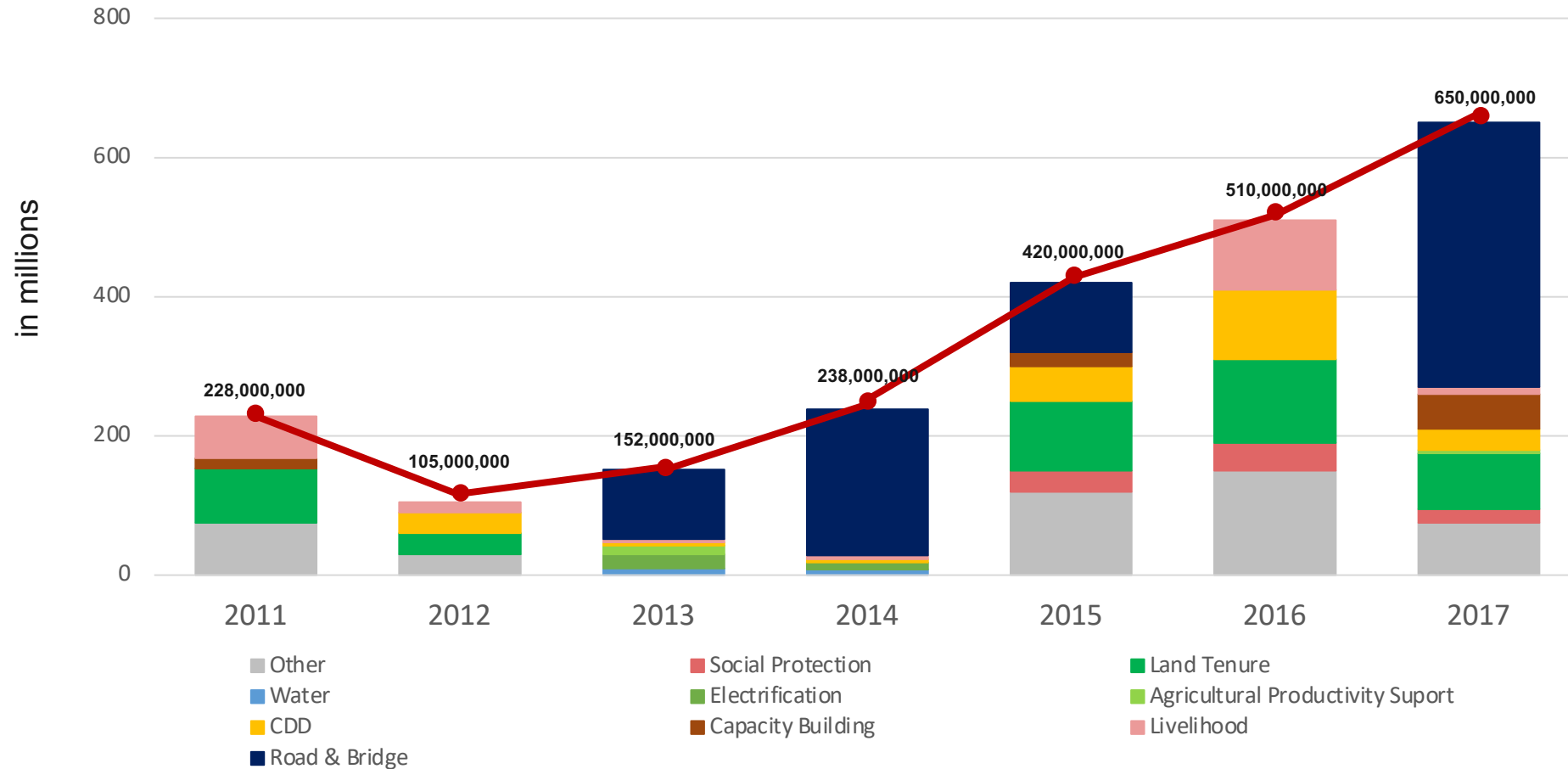


Image Source: Evaluation of the Payapa and Masaganang Pamayanan (PAMANA) Program, Innovations for Poverty Action, 20 Nov 2019

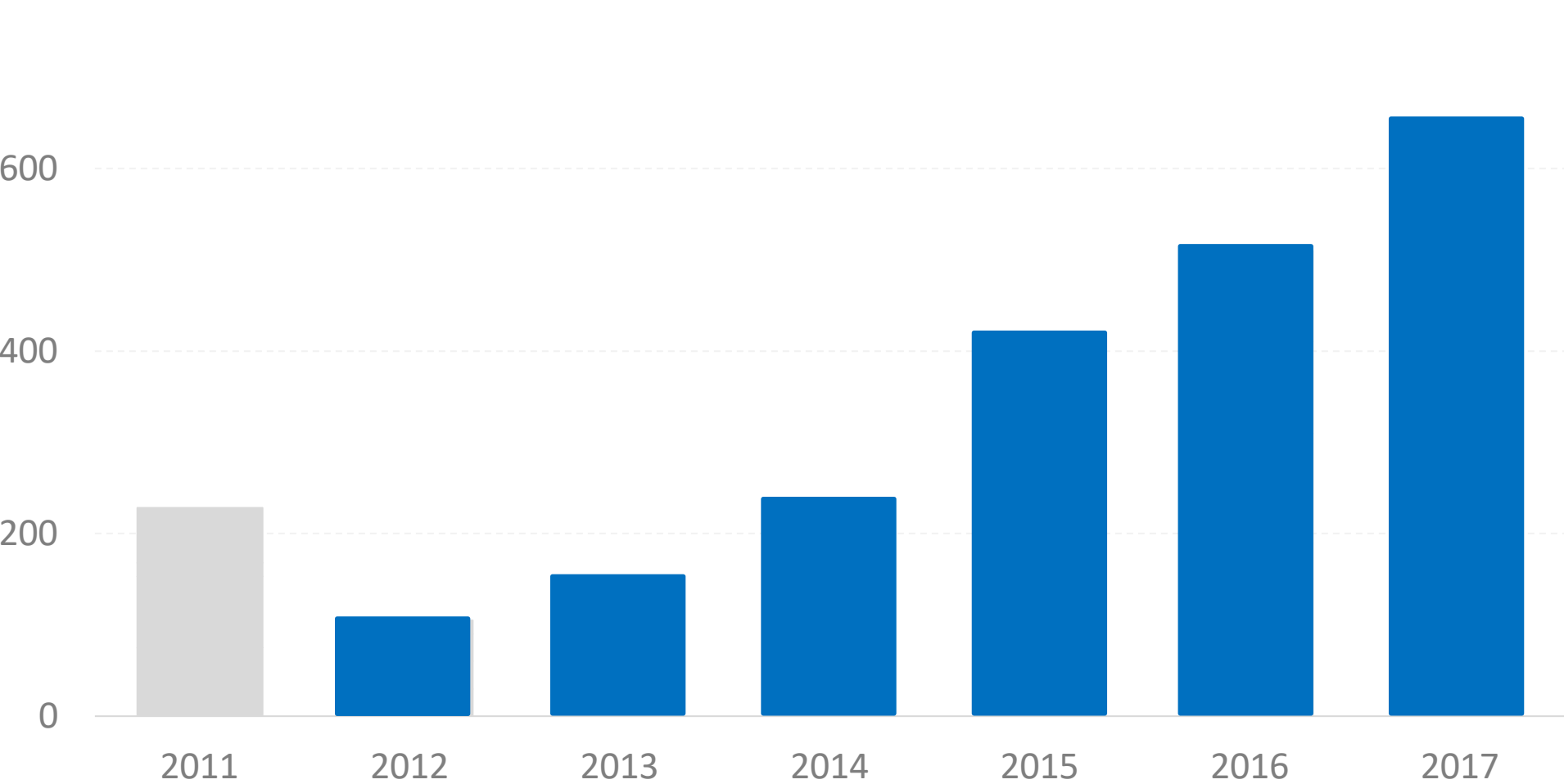


BARAHA Expenditures by Project Type (RPA)



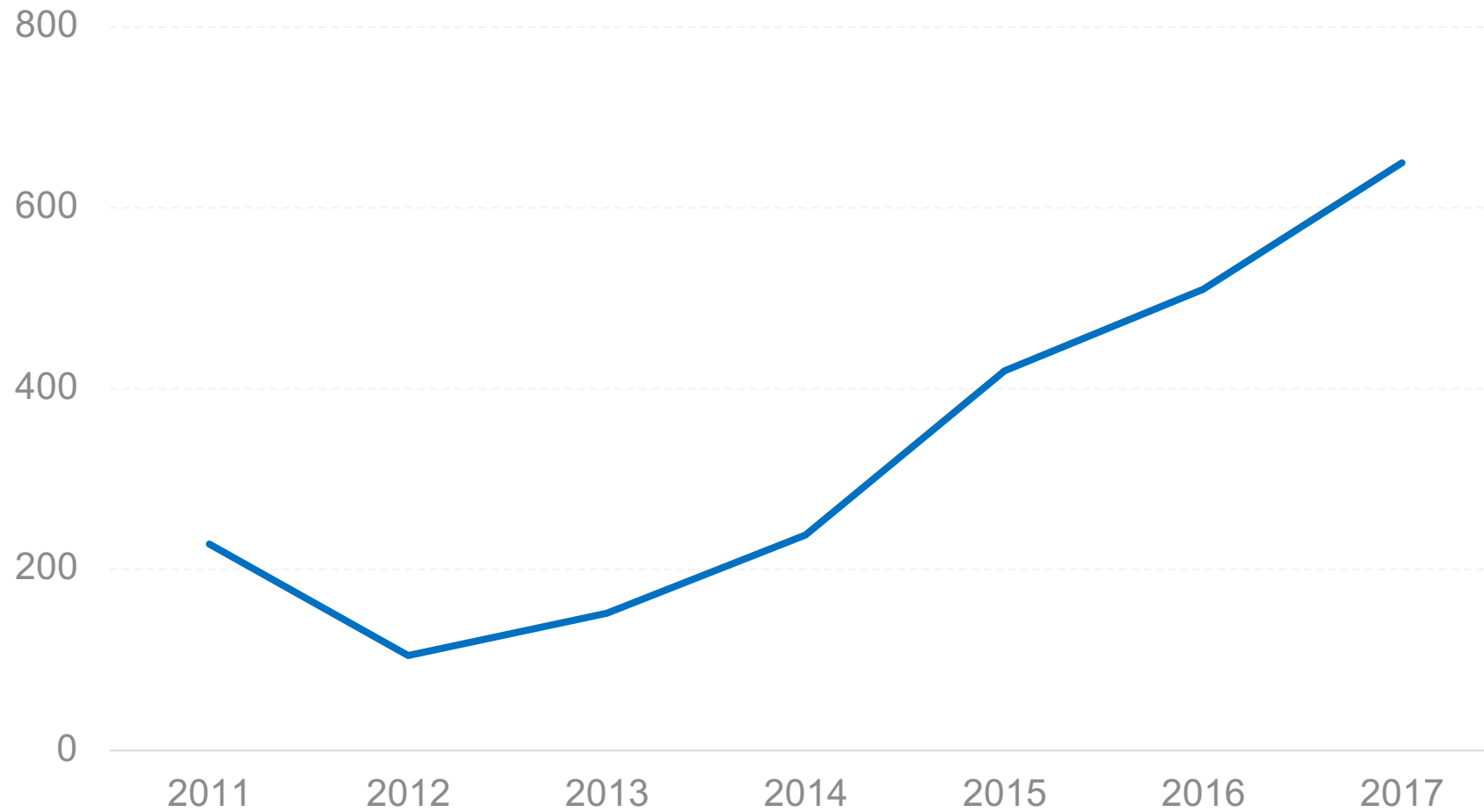
Budget for RPA areas has consistently increased over time.

in millions
800

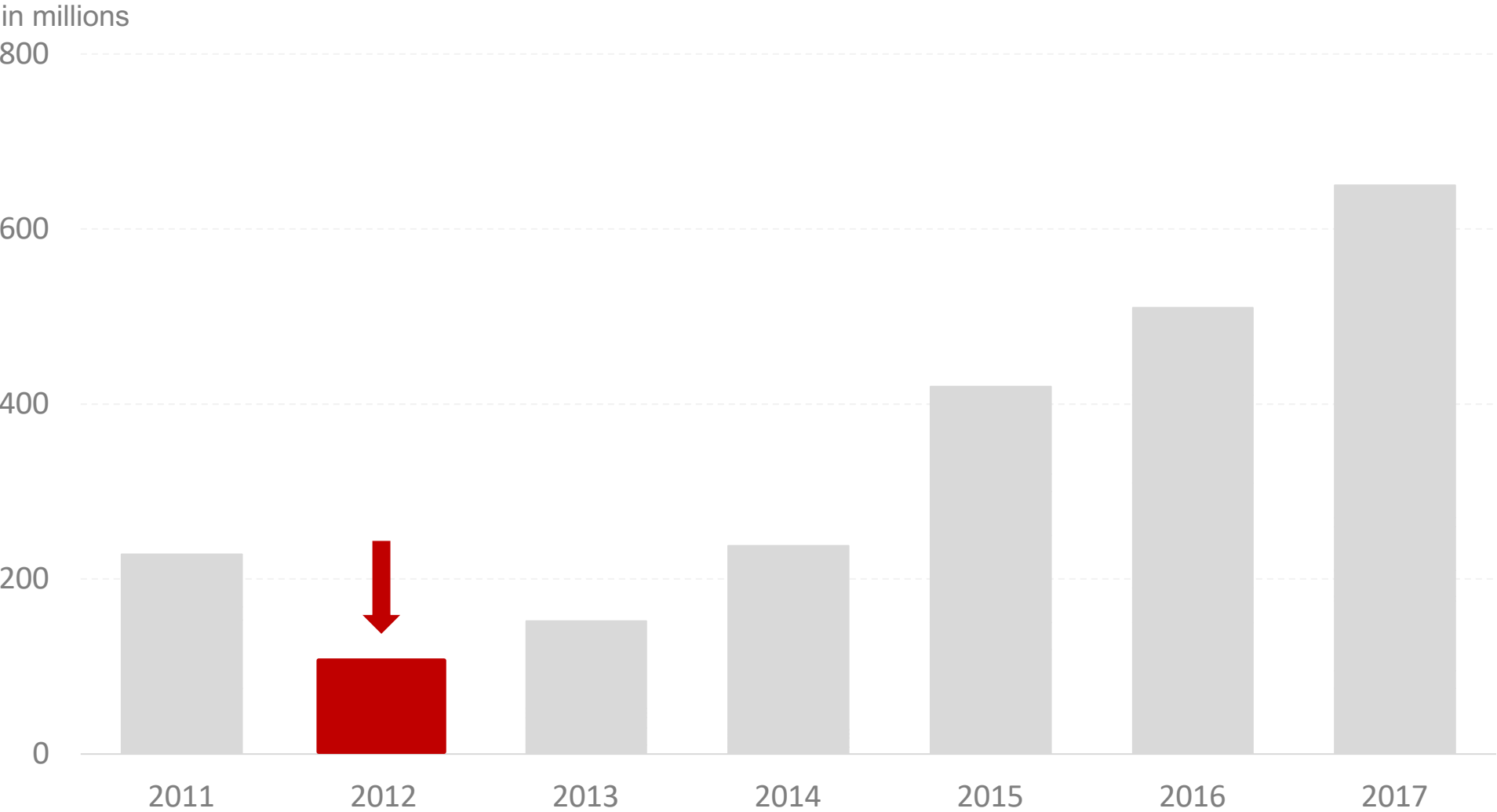


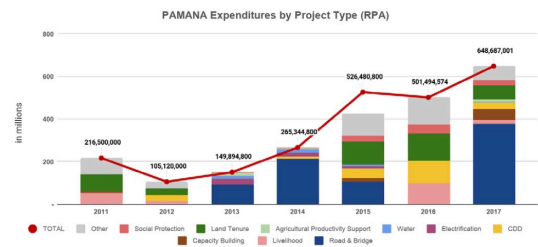
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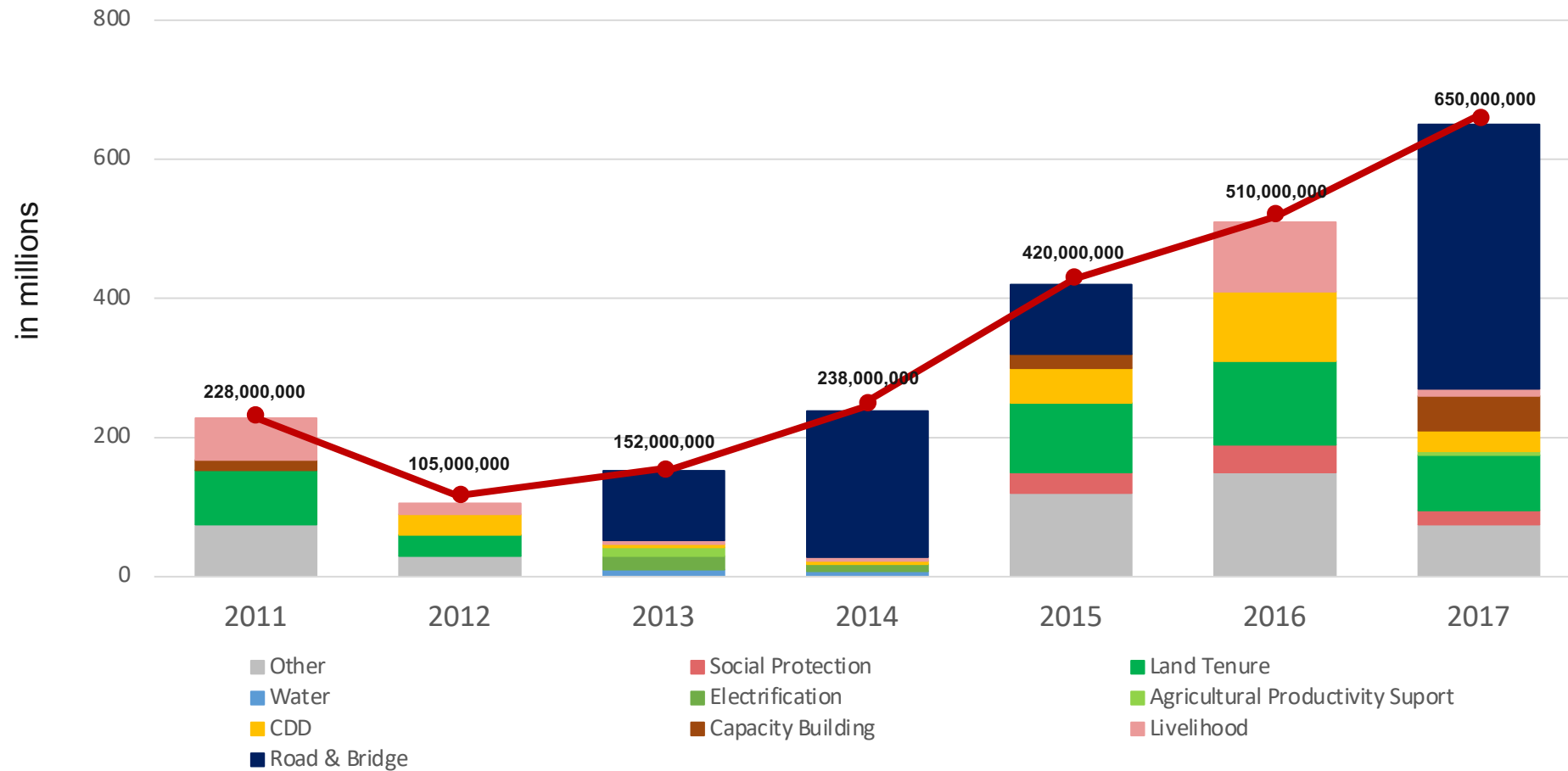


BARAHA Expenditures in **2012** dropped





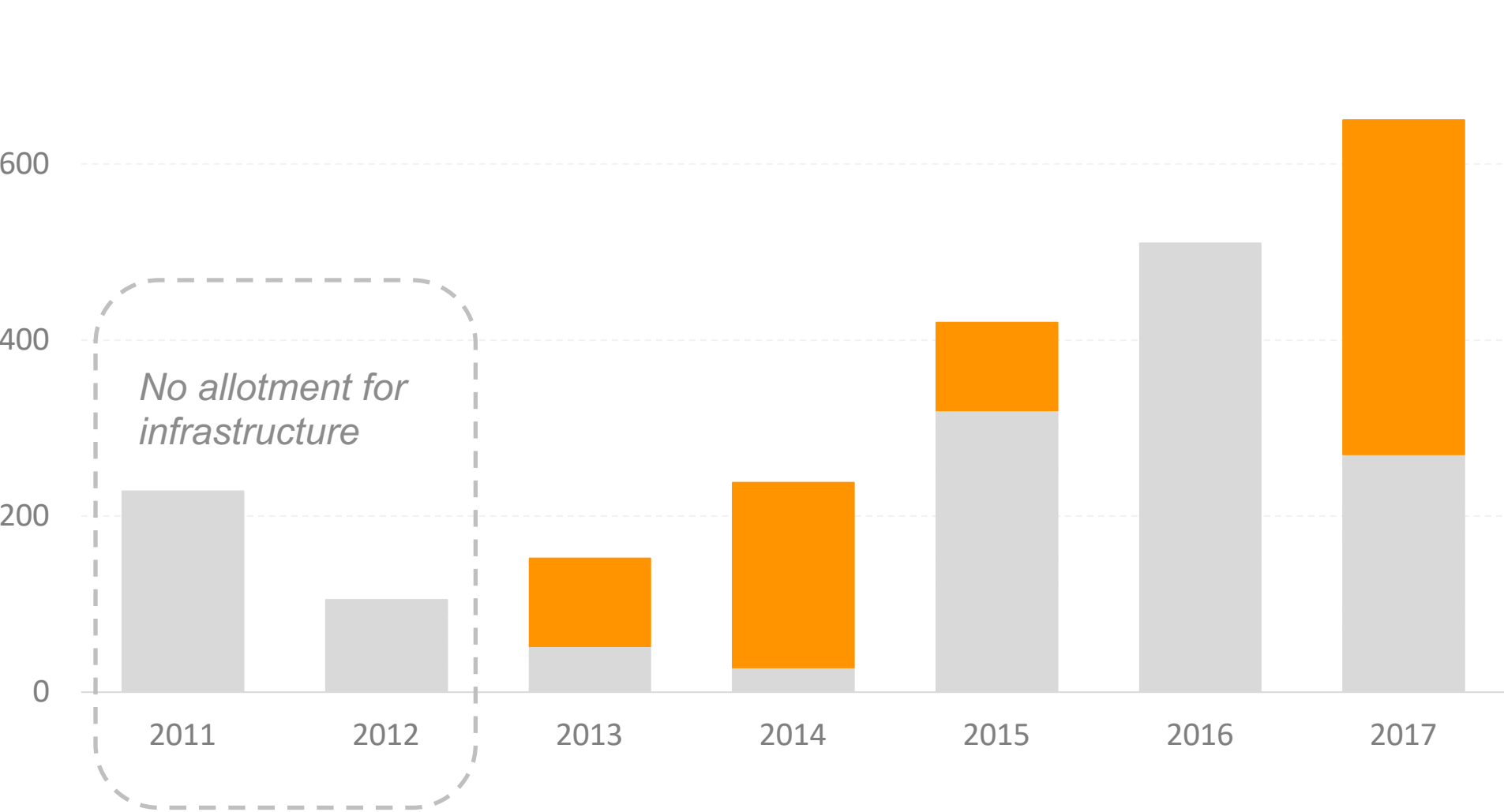
BARAHA Expenditures by Project Type (RPA)



BARAHA Expenditures on **Roads and Bridges**

***Infrastructure** was not always the main project type funded.*

in millions
800



BARAHA Expenditures

in millions
800

600

400

200

0

2011

2012

2013

2014

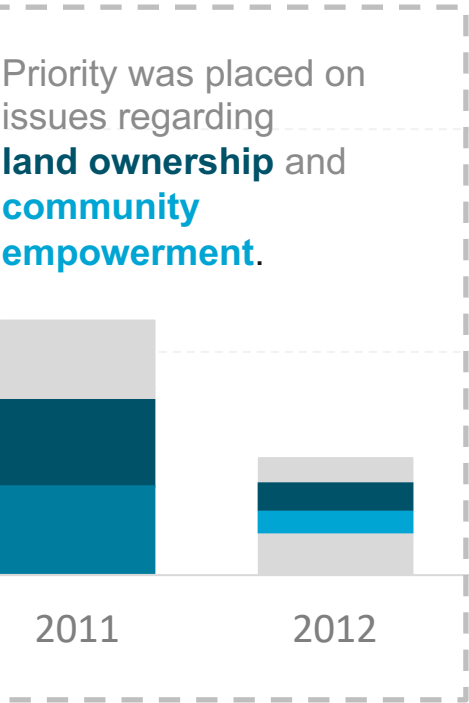
2015

2016

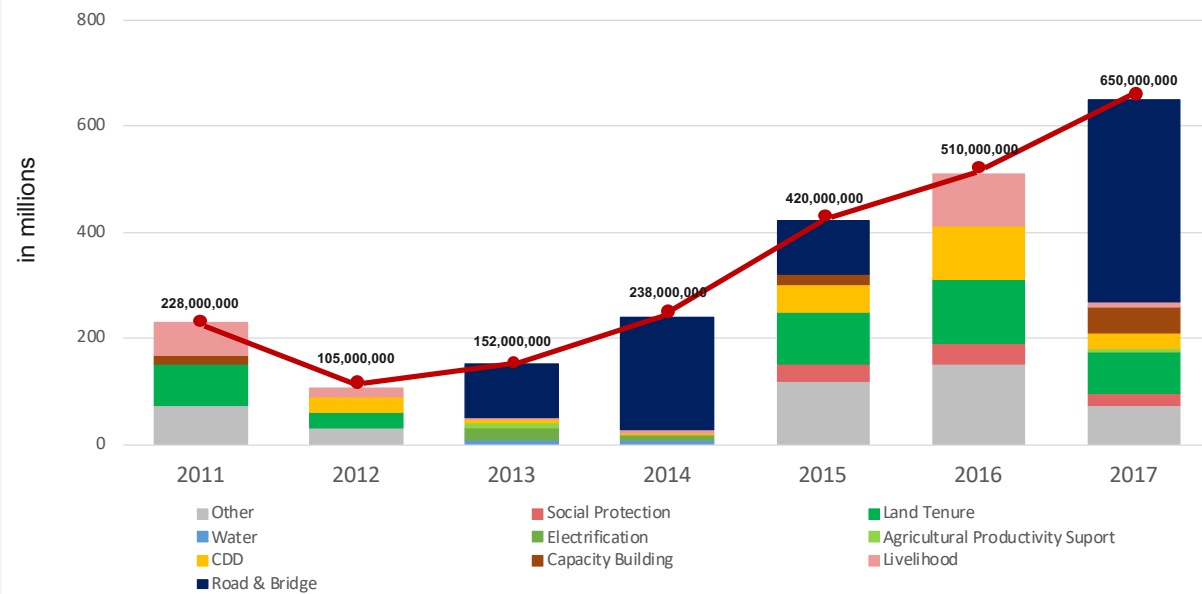
2017

Priority was placed on issues regarding **land ownership** and **community empowerment**.

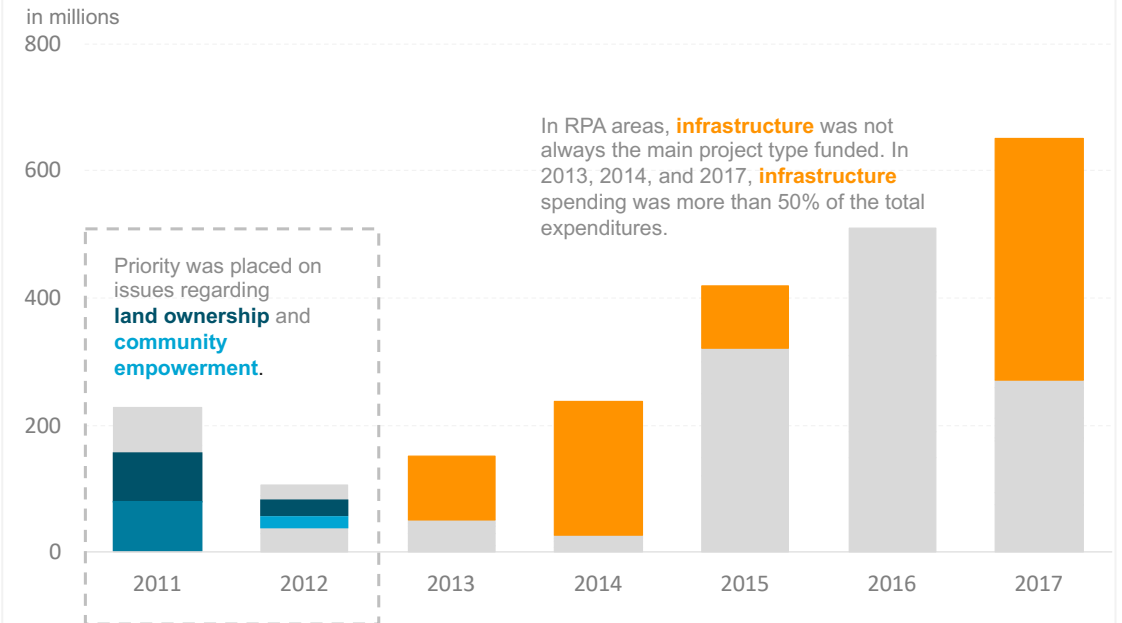
In RPA areas, **infrastructure** was not always the main project type funded. In 2013, 2014, and 2017, **infrastructure** spending was more than 50% of the total expenditures.

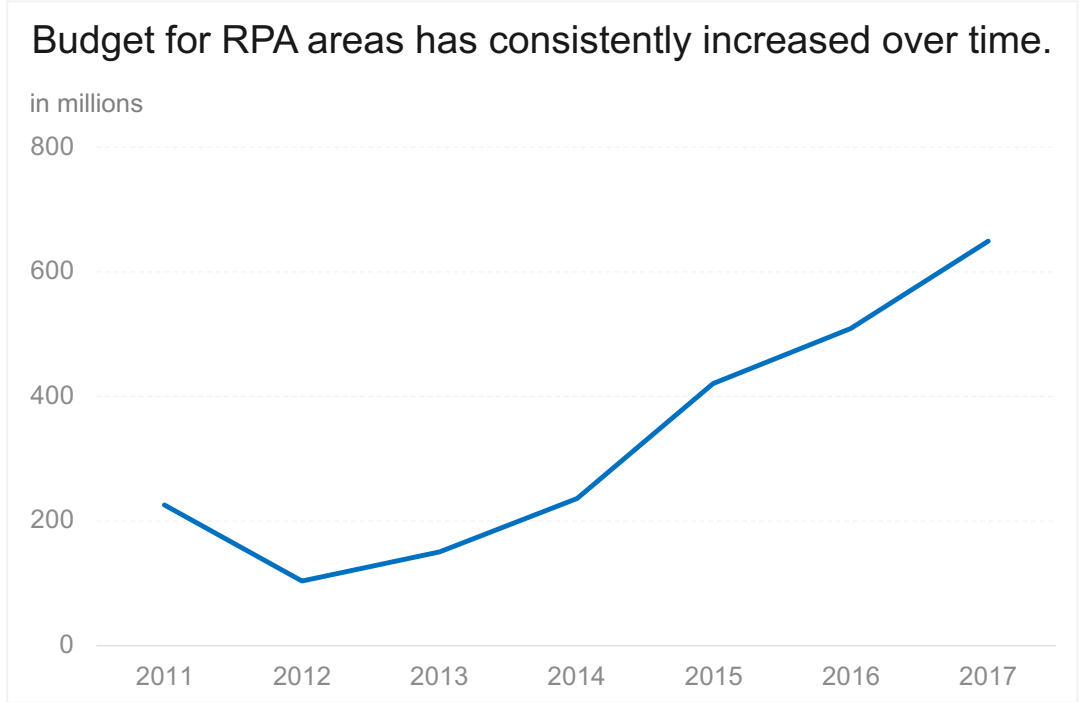
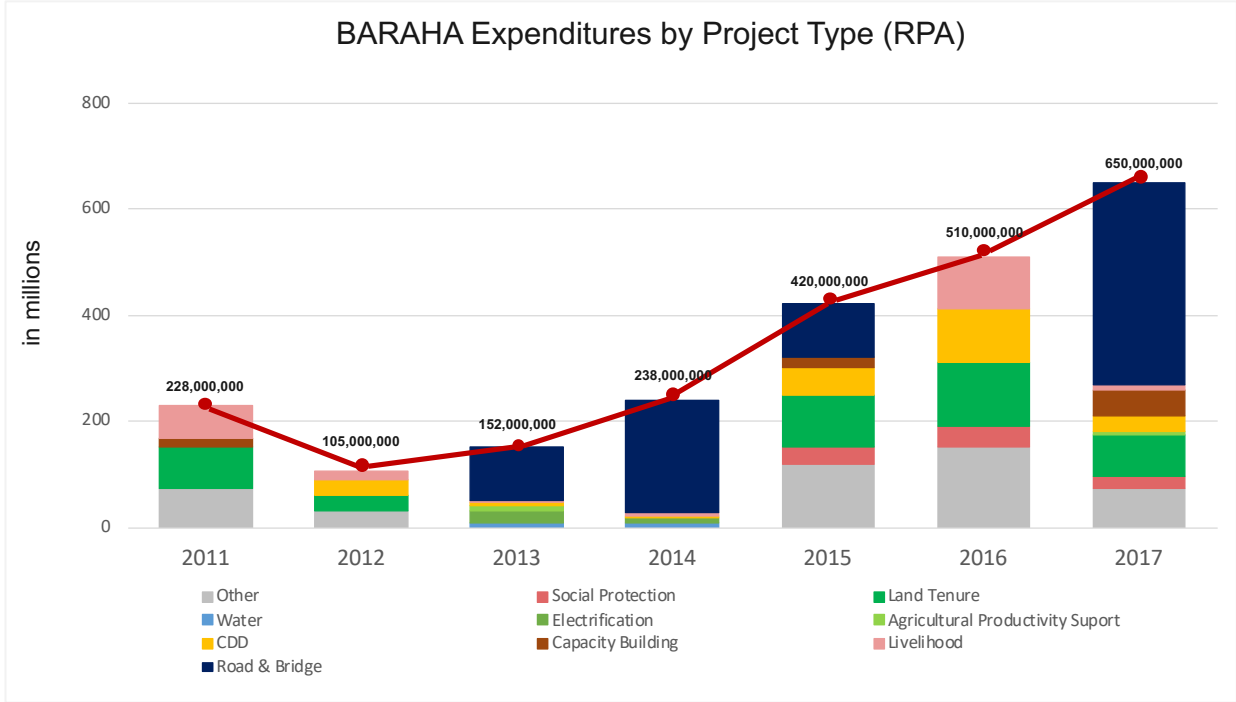


BARAHA Expenditures by Project Type (RPA)



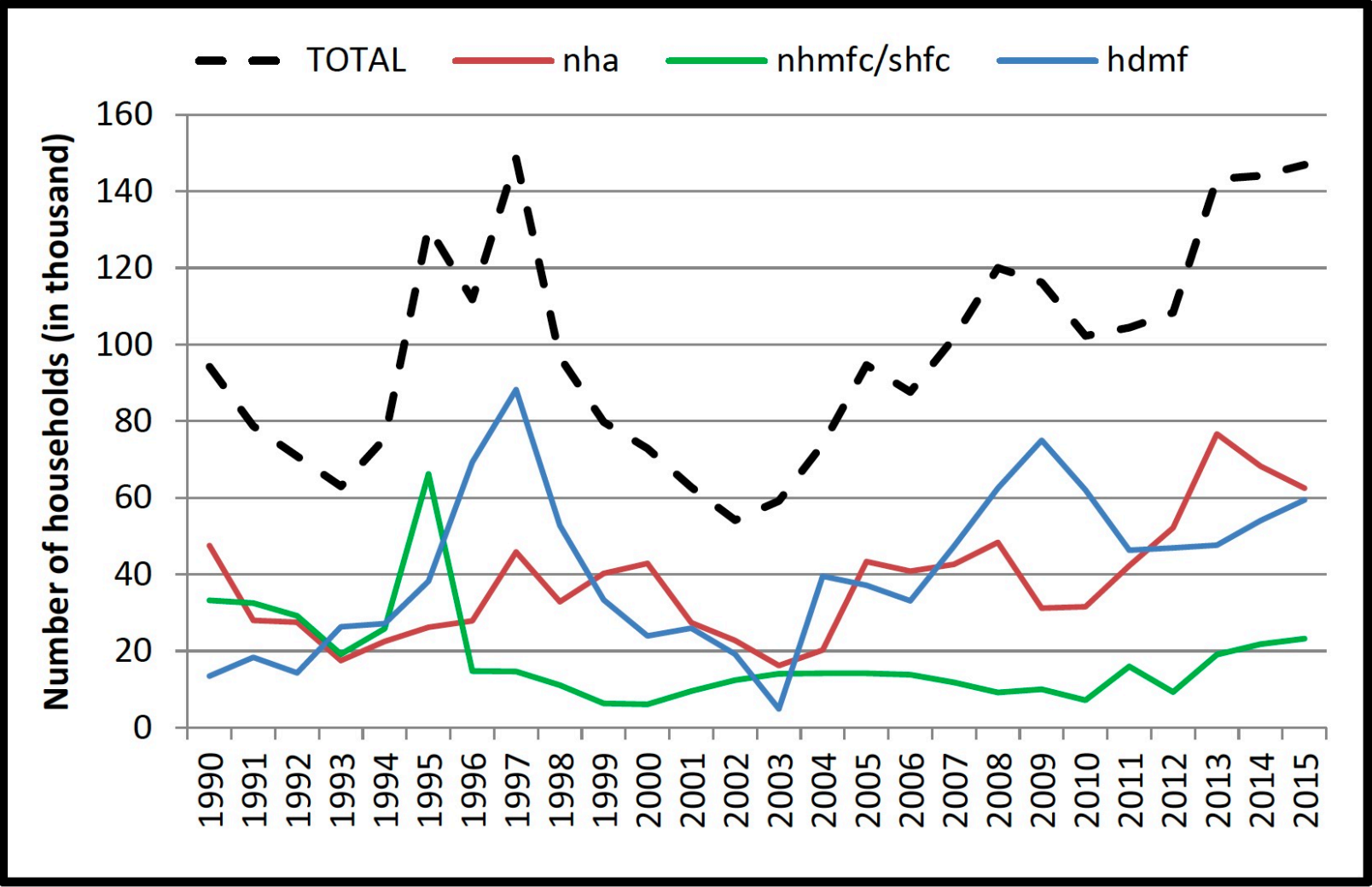
BARAHA Expenditures





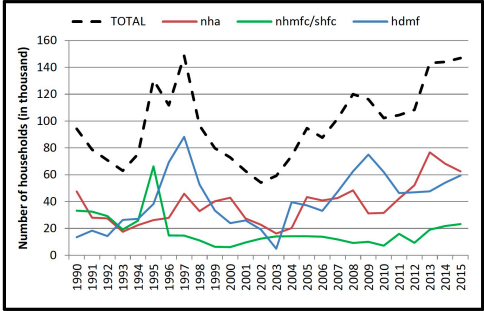
CASE 4

Figure 3. Number of Households Provided with Housing Units and/or Housing Loans Administered by Government: Direct Housing Provision, 1990-2015

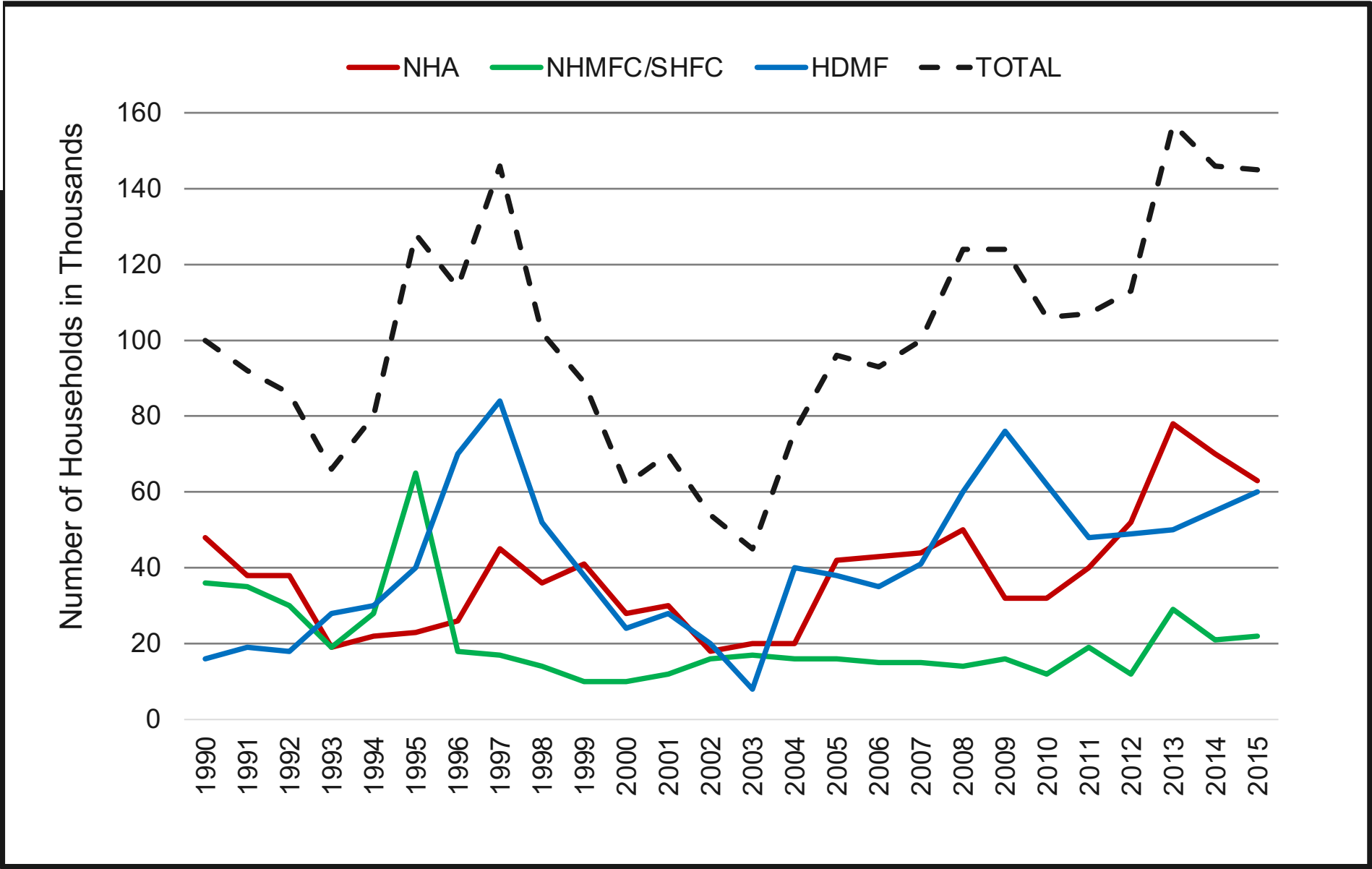


Impact Assessment of
the National Shelter
Program (Final Report),
October 2018.

Figure 3. Number of Households Provided with Housing Units and/or Housing Loans Administered by Government: Direct Housing Provision, 1990-2015

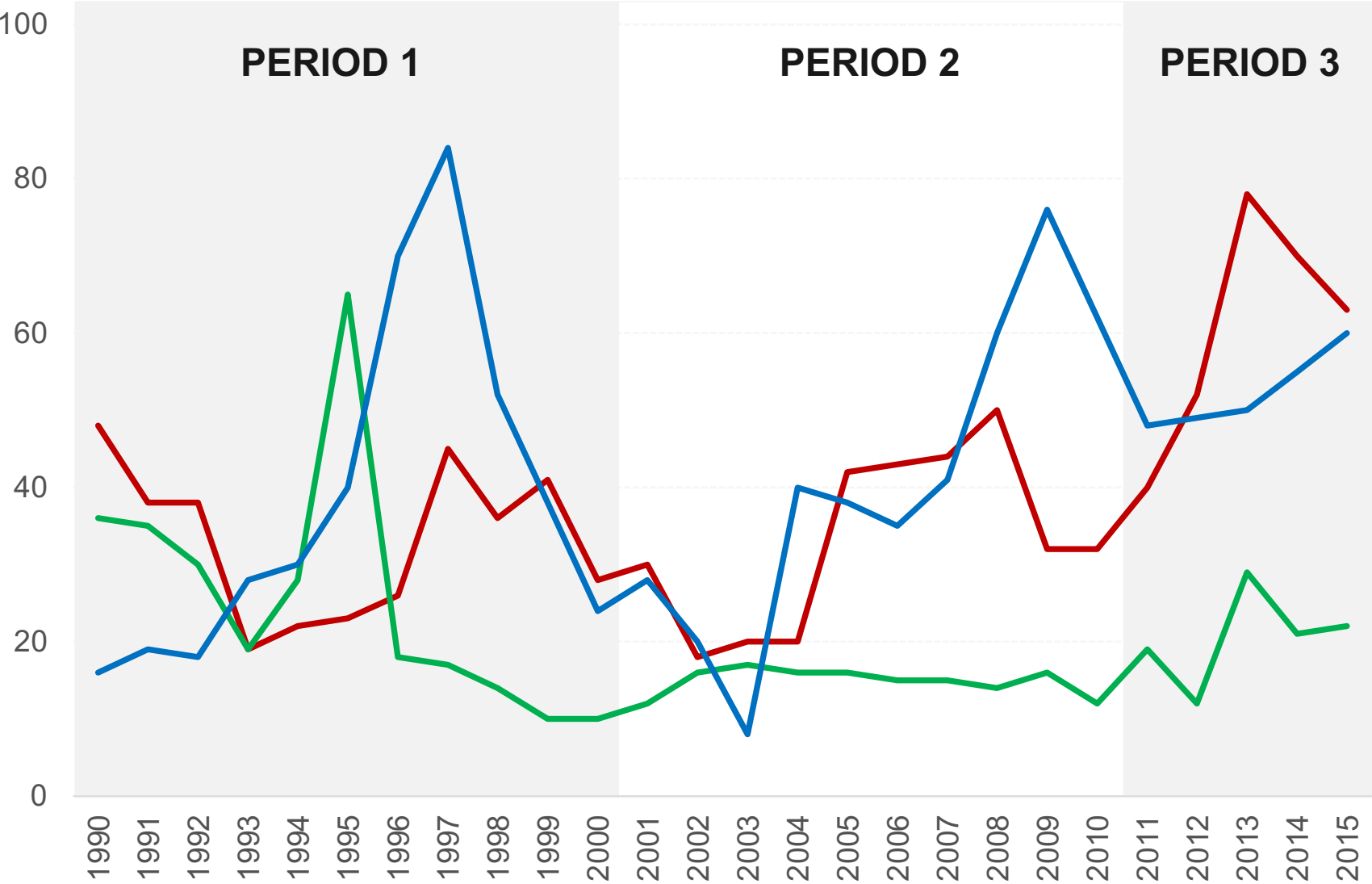


Impact Assessment of the National Shelter Program (Final Report), October 2018.



Households Provided with Housing Units

in thousands



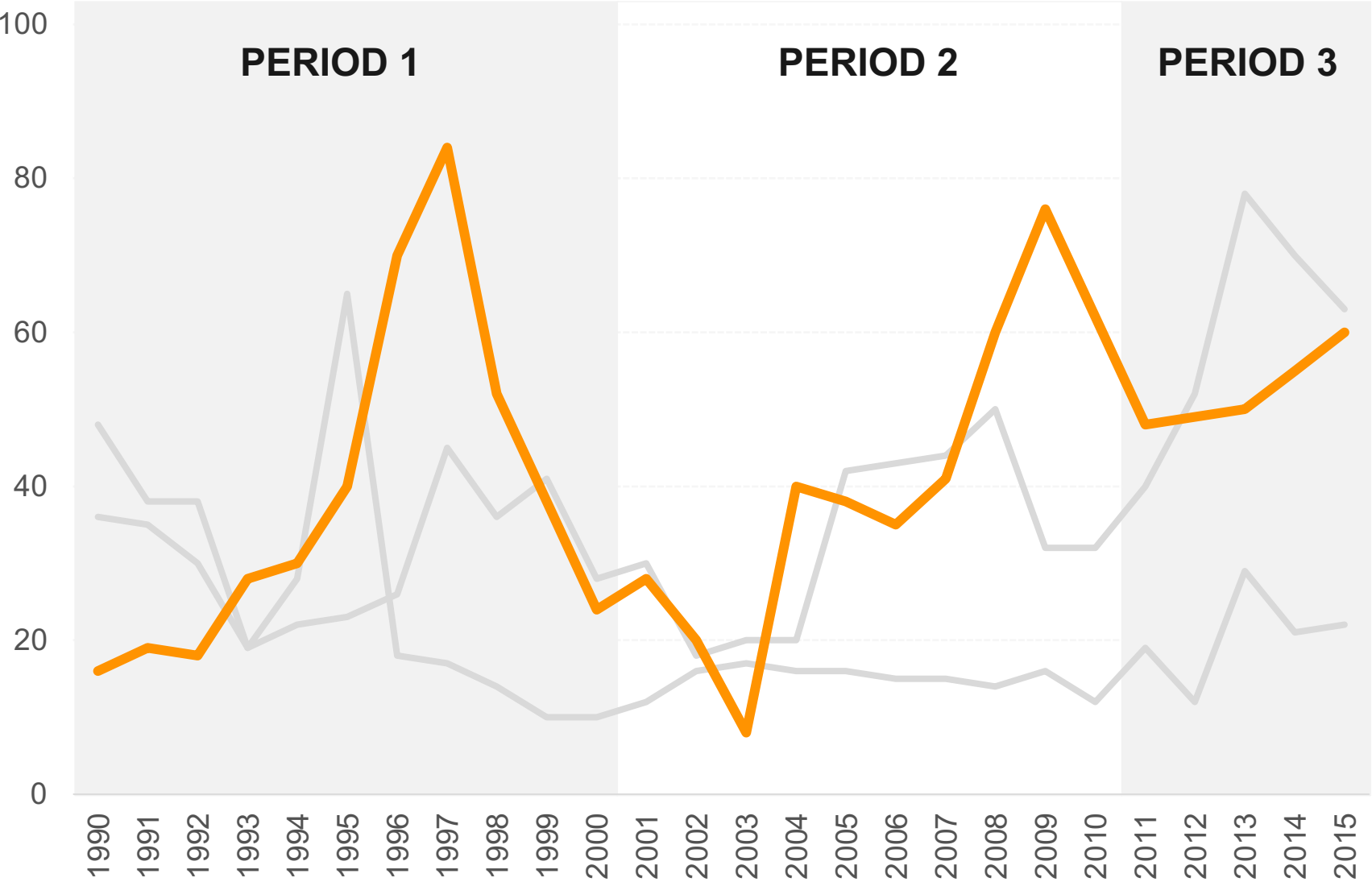
NHA's share sharply increased reaching 46.6% in **PERIOD 3**.

In the first two periods, **HDMF** accounted for the largest shares of households served.

SHFC's share was prominent in the first period, which dropped in 1996 and remained low with a sharp increase in 2013.

Households Provided with Housing Units

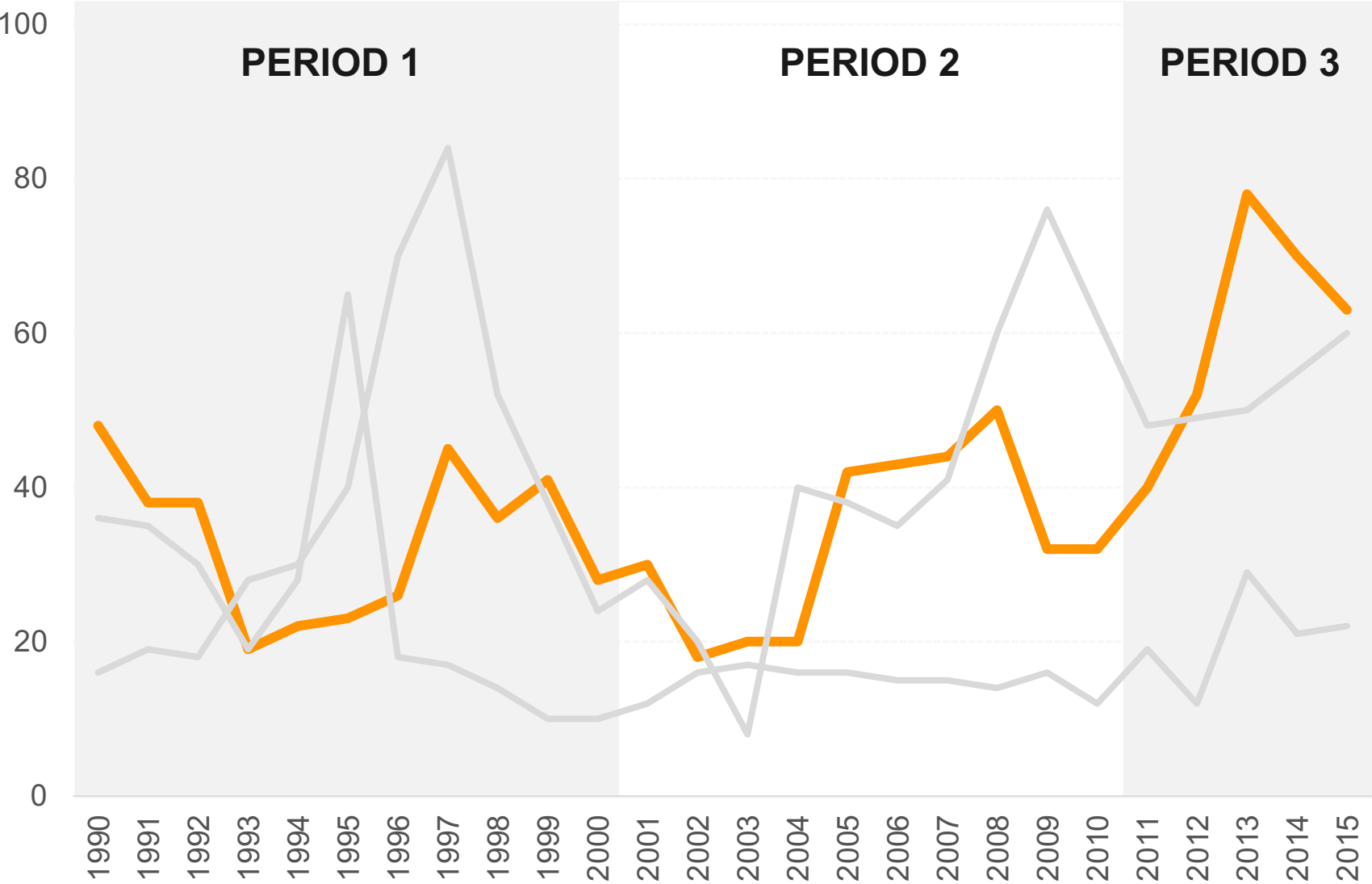
in thousands



In the first two periods, **HDMF** accounted for the largest shares of households served.

Households Provided with Housing Units

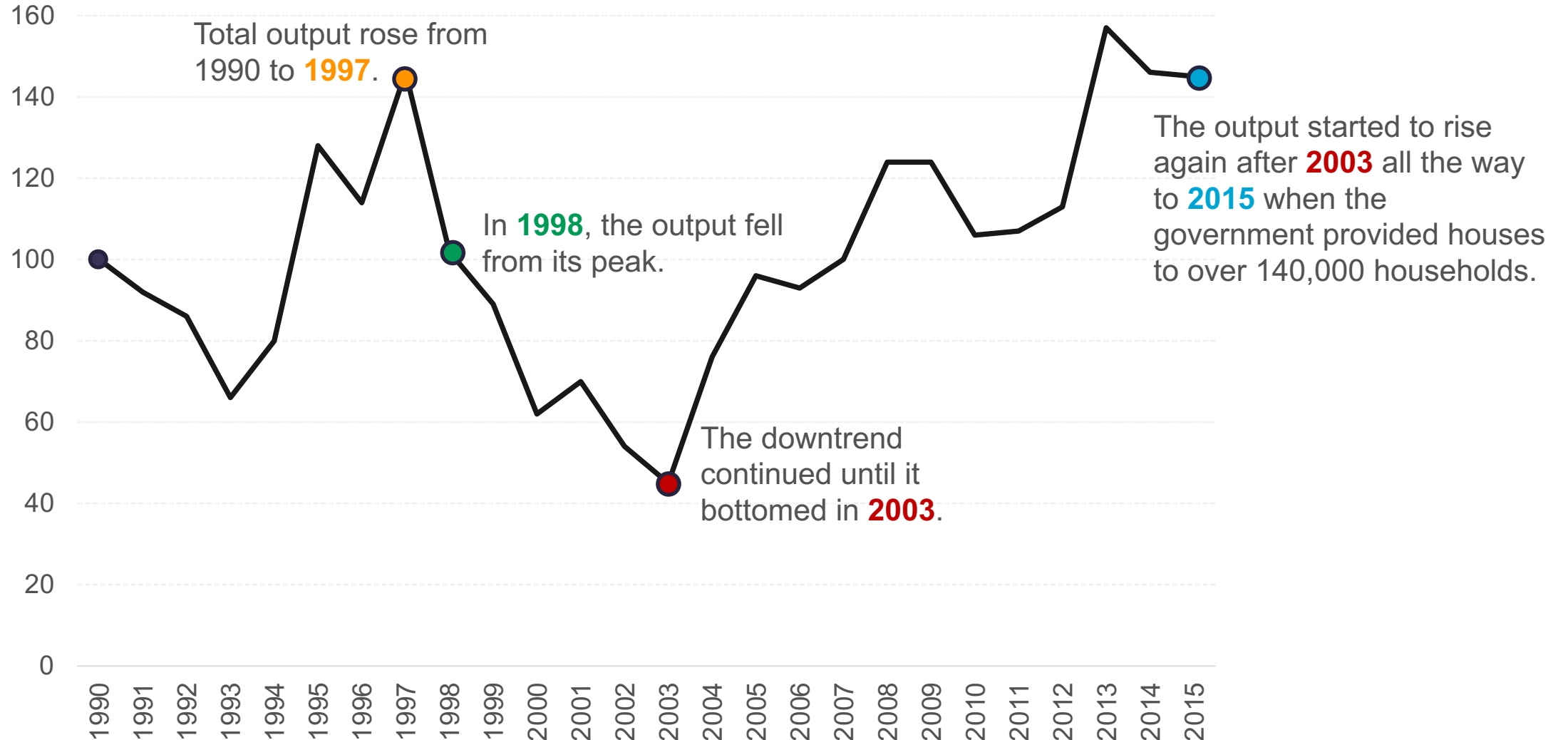
in thousands



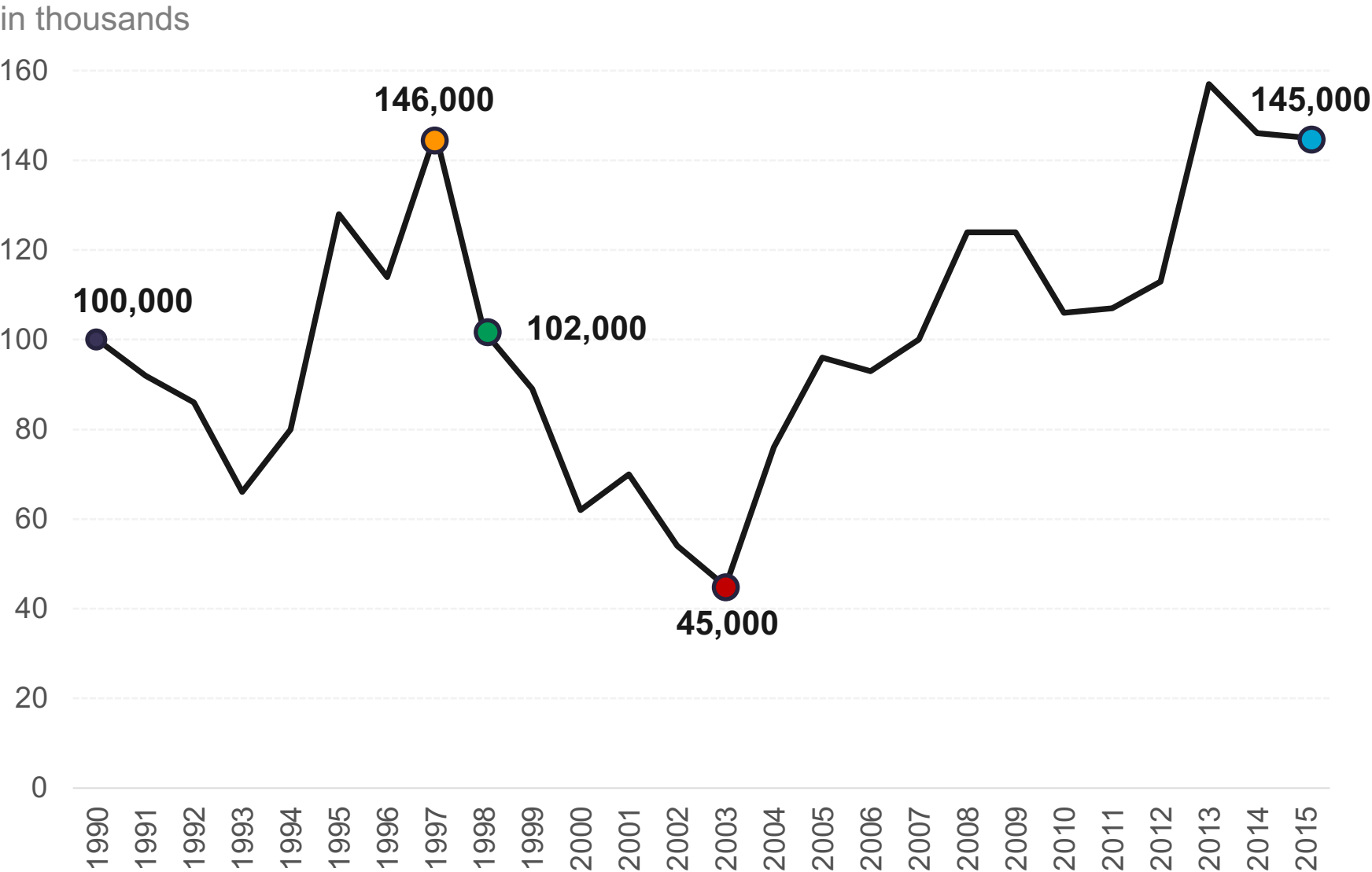
NHA's share sharply increased reaching 46.6% in **PERIOD 3**, from 2011.

Households Provided with Housing Units

in thousands



Households Provided with Housing Units



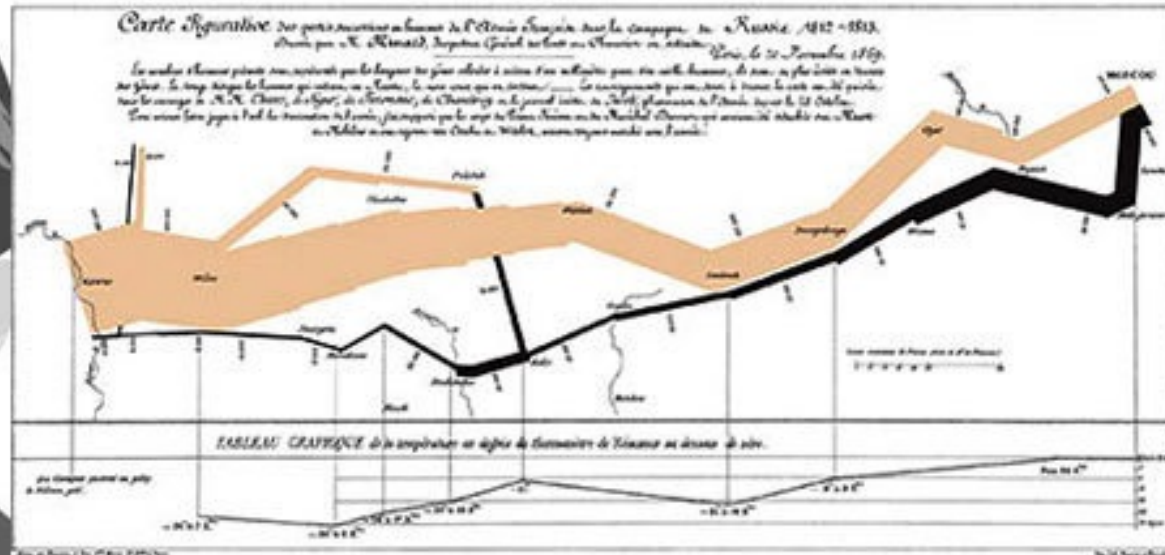
Total housing output rose from 1990 to **1997**. In **1998**, the output fell from its peak.

The downtrend continued until it bottomed in **2003**.

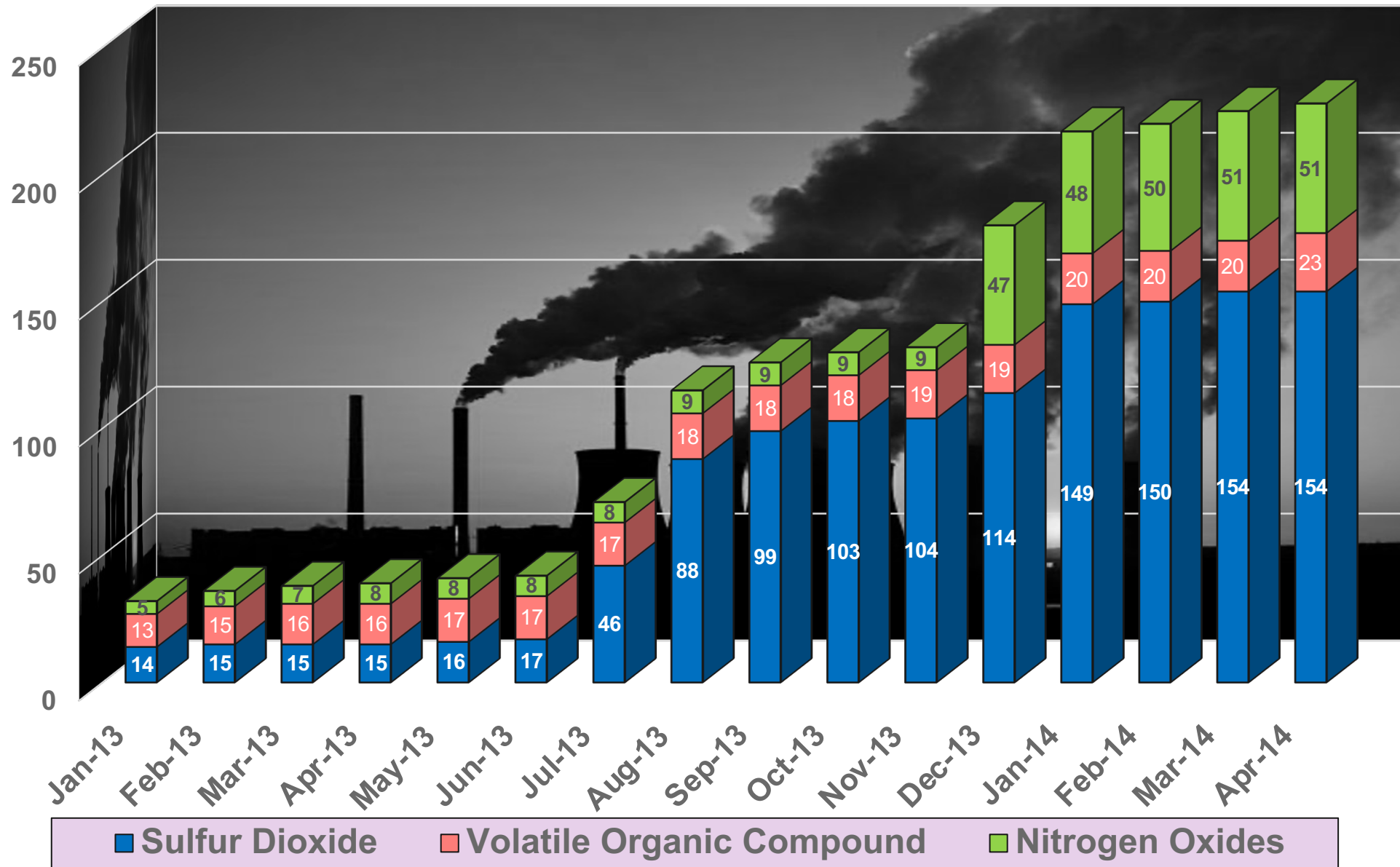
The output then started to rise again after **2003** all the way to **2015** when the government provided houses to over 140,000 households.

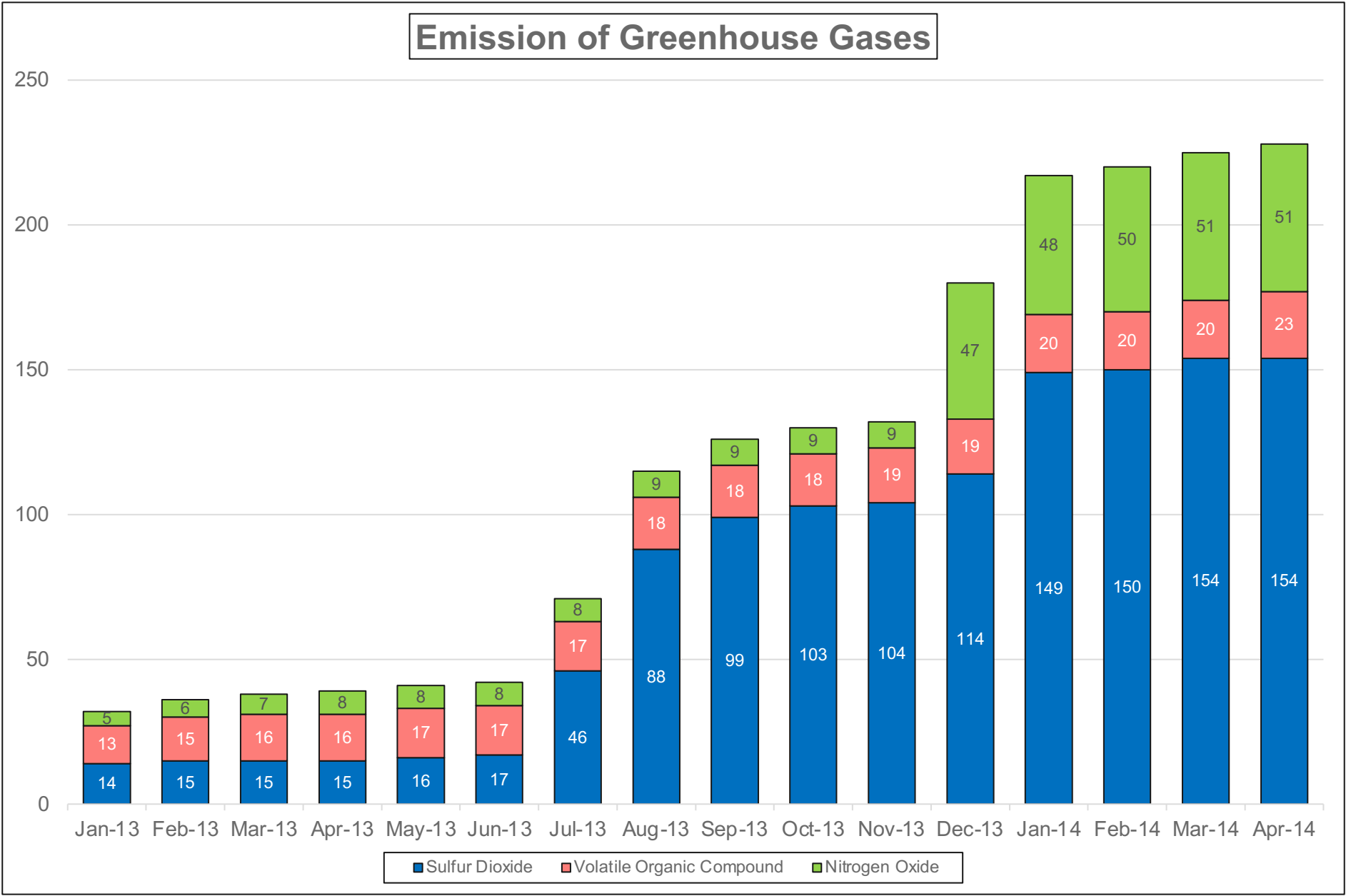
CASE 5

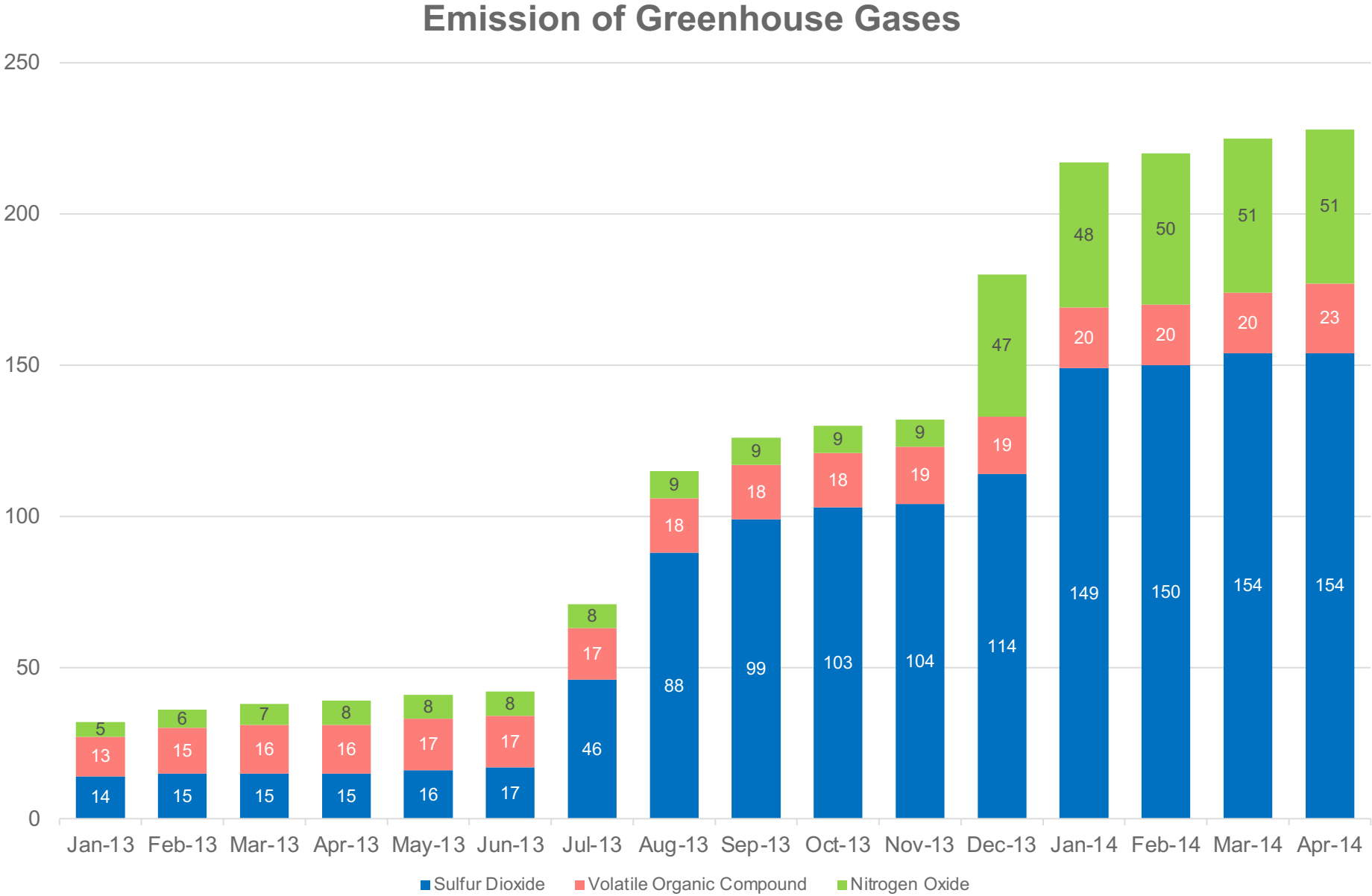
Data-ink

$$\text{Data-ink ratio} = \frac{\text{Data ink}}{\text{Total ink used to print graphic}}$$


Emission of Green House Gases

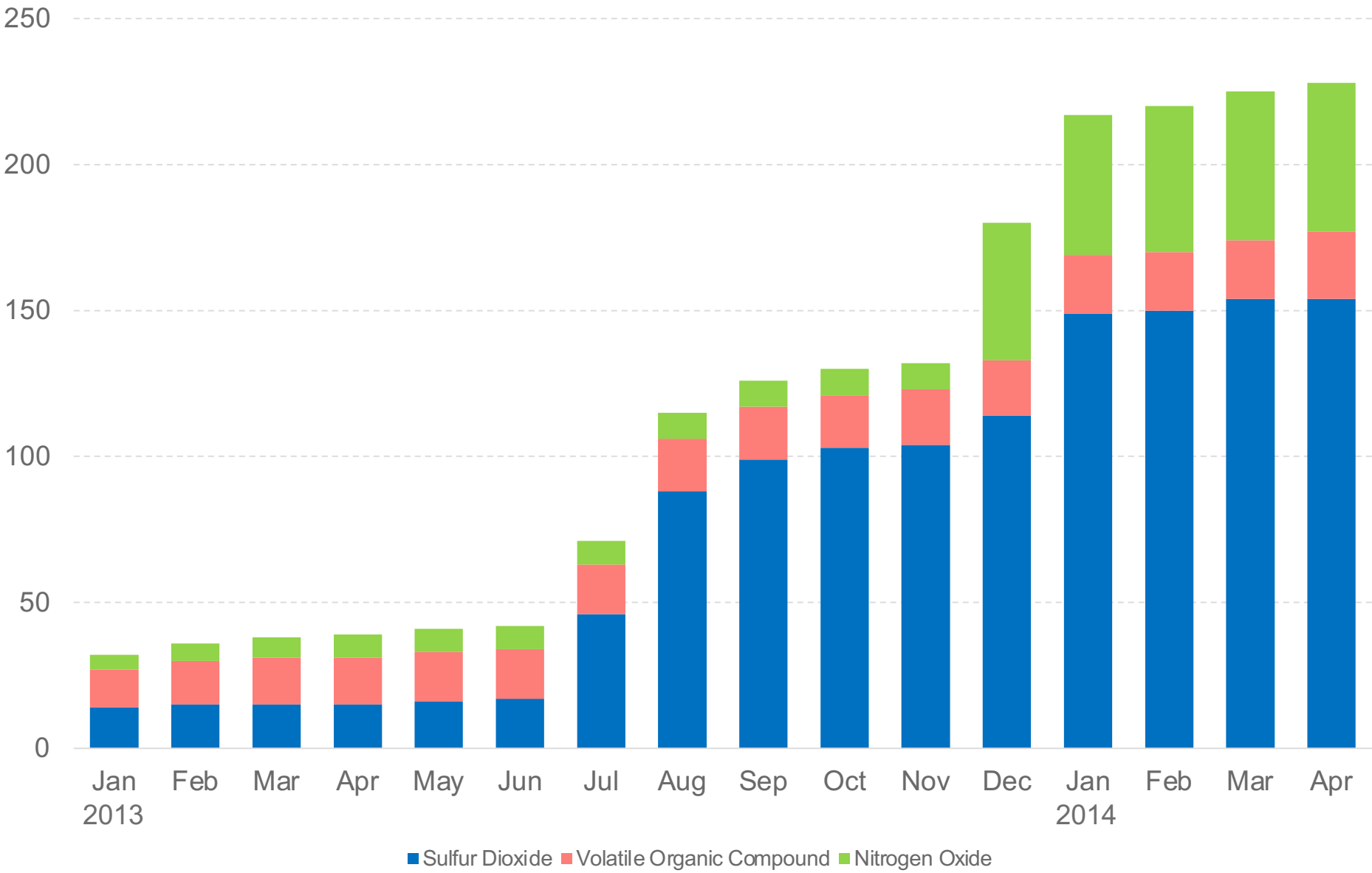






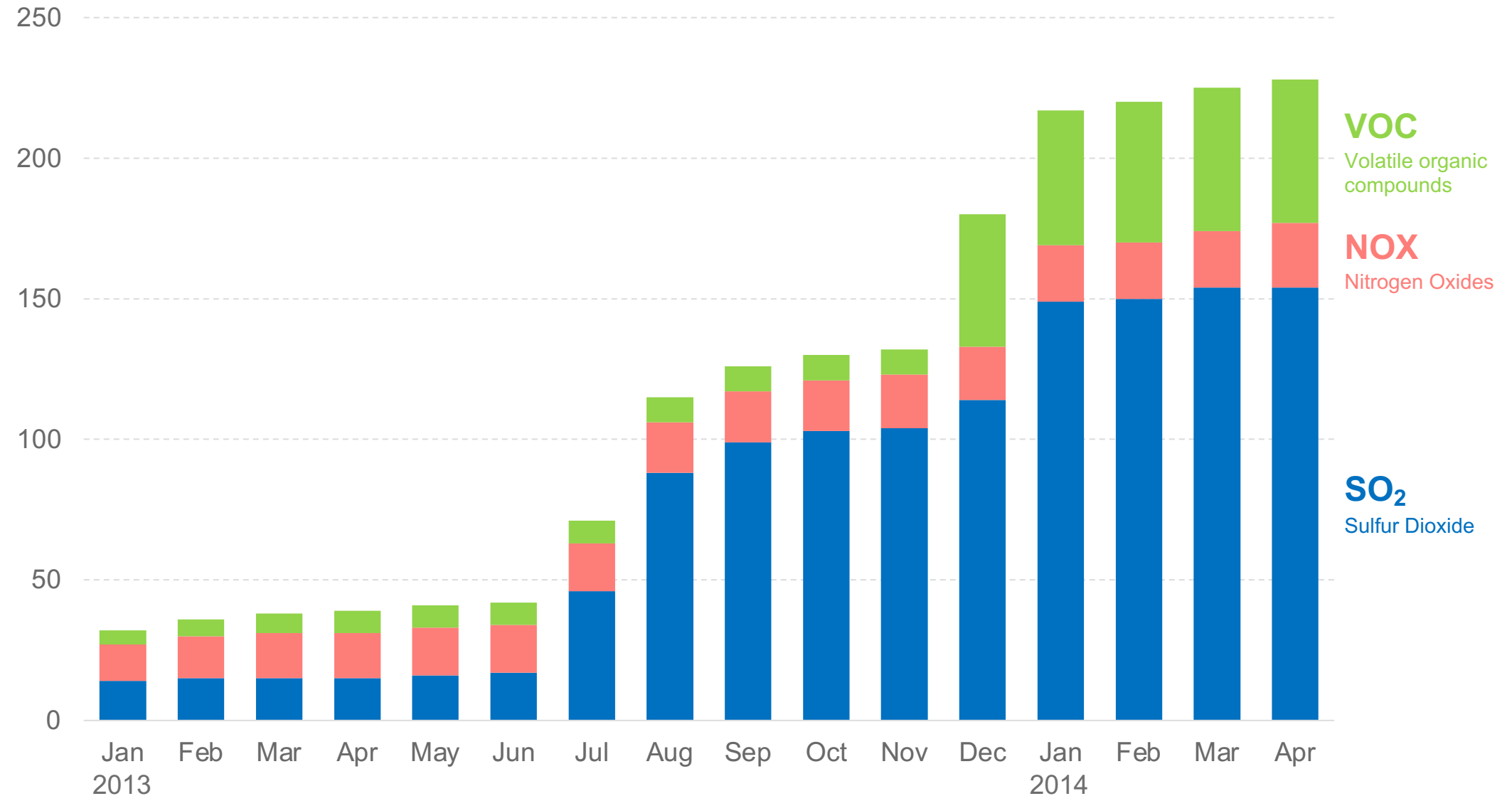
EMISSIONS OF GREENHOUSE GASES

'000 Tonnes



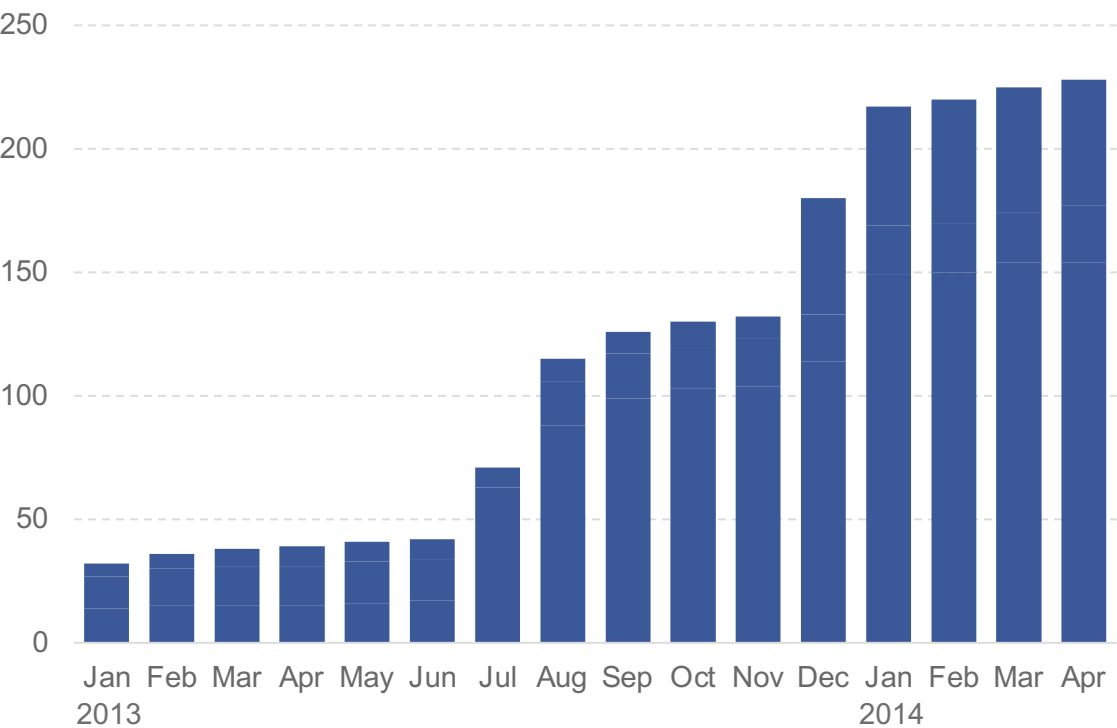
EMISSIONS OF GREENHOUSE GASES

'000 Tonnes



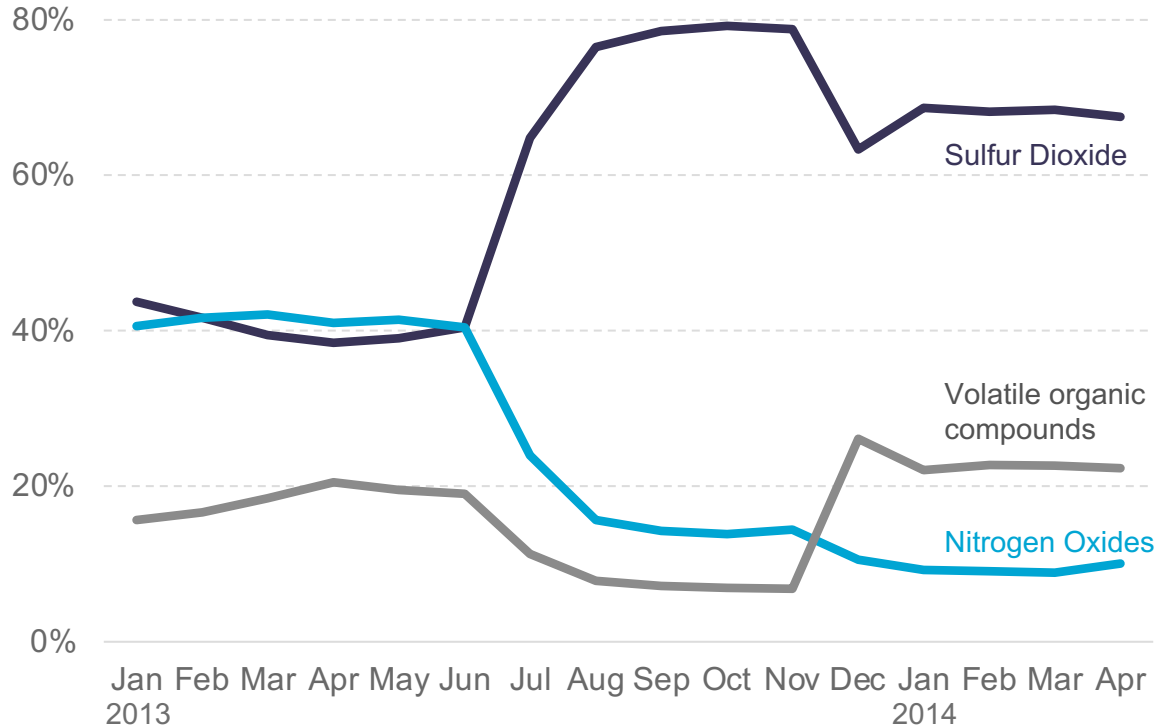
TOTAL EMISSION OF GREENHOUSE GASES

'000 Tonnes

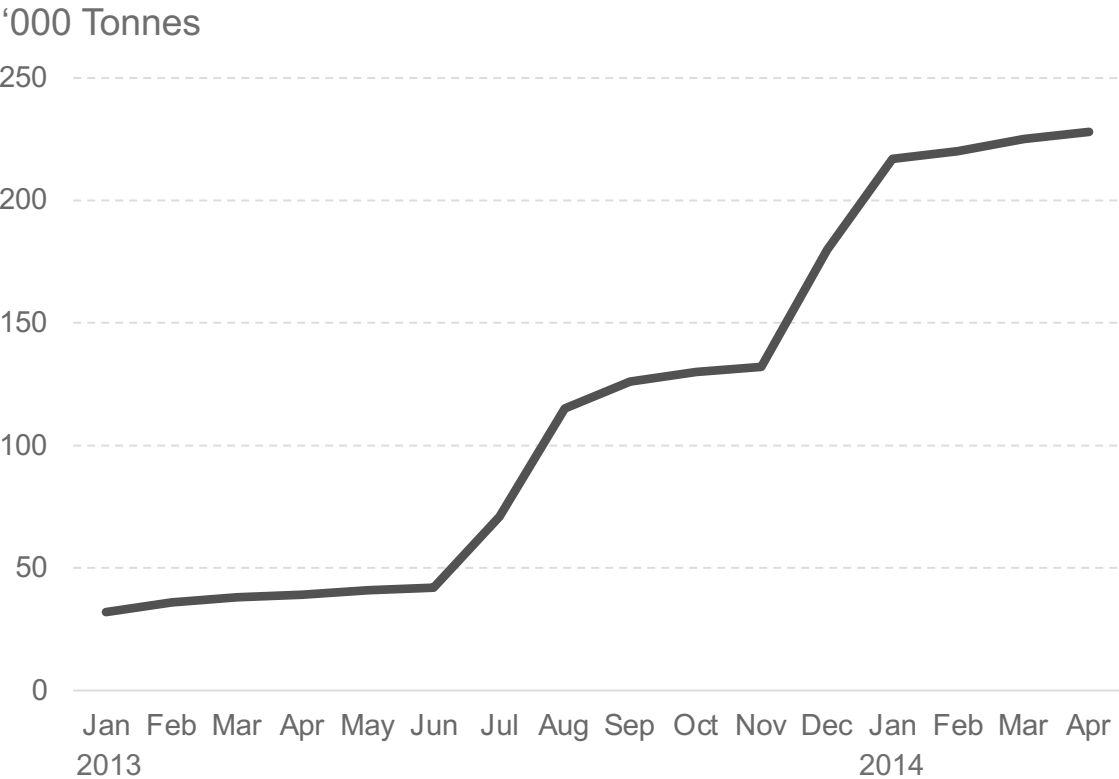


TOTAL EMISSION OF GREENHOUSE GASES

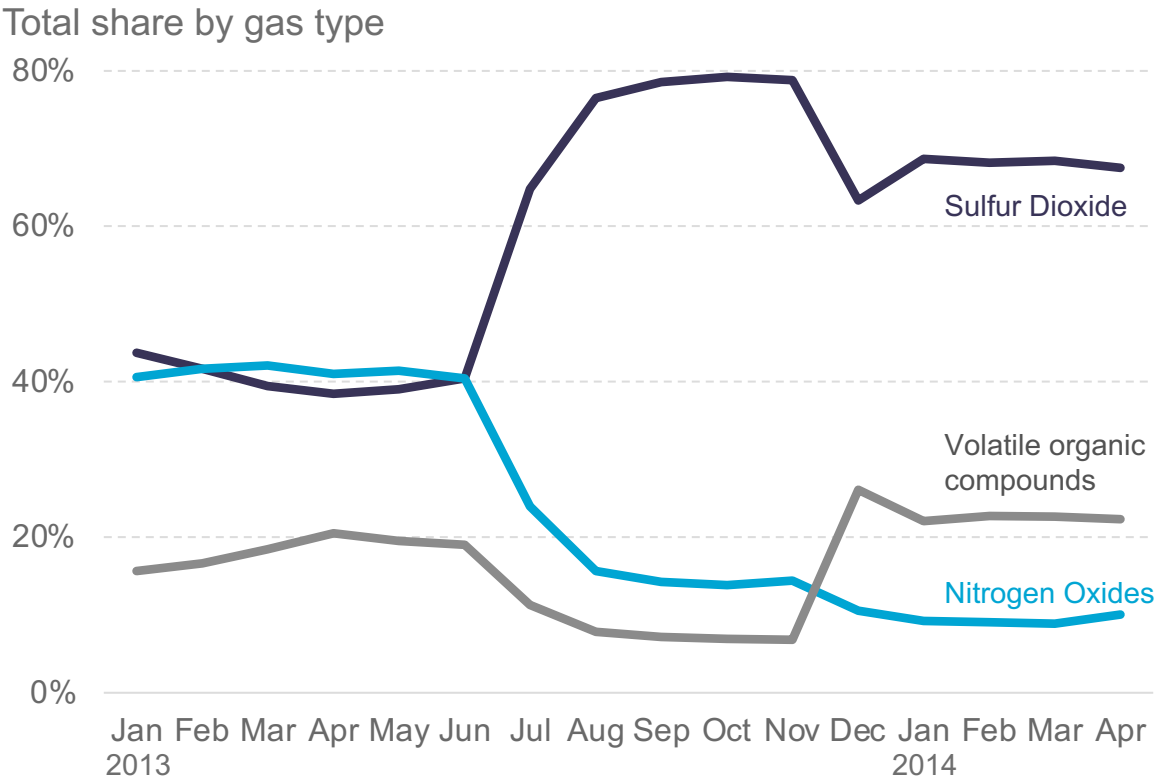
Total share by gas type



INCREASING TOTAL EMISSION OF GREENHOUSE GASES



TOTAL EMISSION OF GREENHOUSE GASES



What are
data visualizations
for?

FOUR IDEAS

Good Charts by Scott Berinato

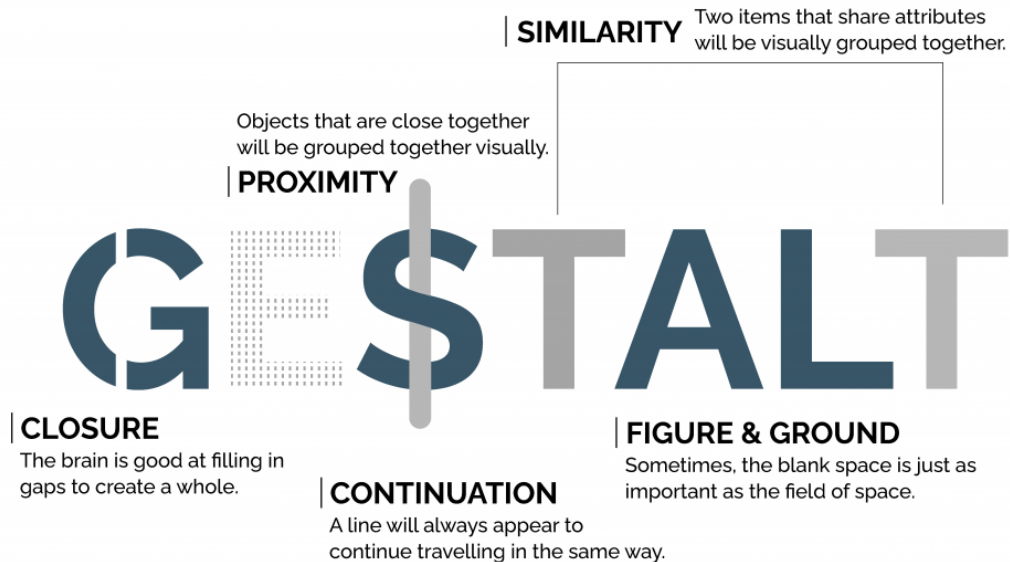
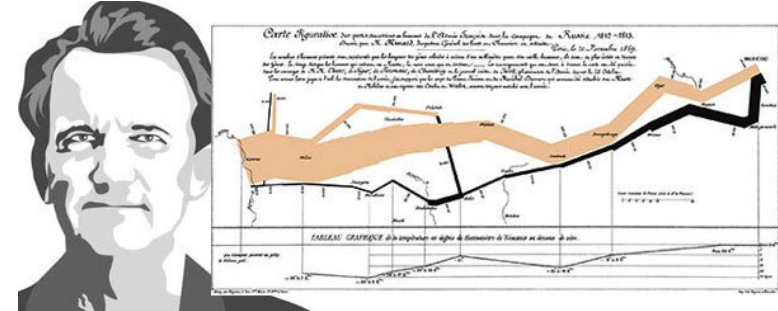
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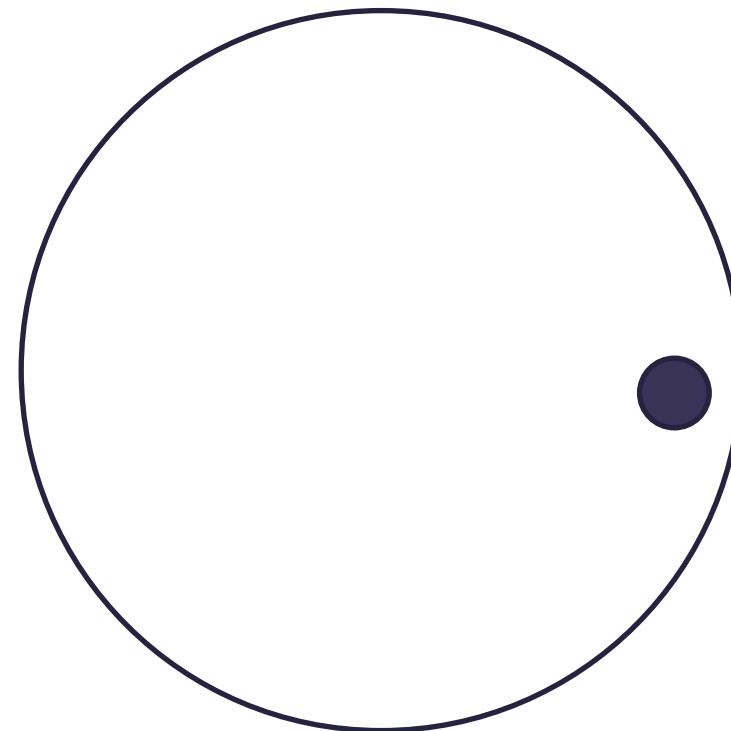
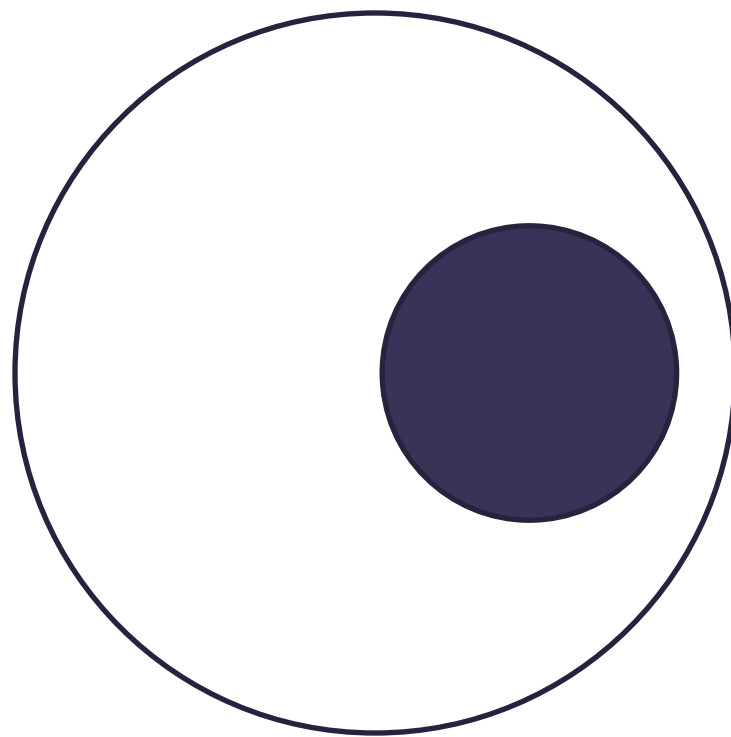
We seek meaning and make connections.

$$\text{Data-ink ratio} = \frac{\text{Data-ink}}{\text{Total ink used to print graphic}}$$



Know Your Audience





Who is your **AUDIENCE**?

What is **AT STAKE**?

Articulate your **BIG IDEA**.

Originally introduced by Nancy Duarte (2019).
Reformulated by Cole Knafllic.

Who is your **AUDIENCE**?

List the primary groups or individuals to whom you'll be communicating.

What does your audience care about?

If you had to narrow that to a *single person*, who would that be?

What action does your audience need to take?

Who is your **AUDIENCE**?

List the primary groups or individuals to whom you'll be communicating.

the whole IATF team

If you had to narrow that to a *single person*, who would that be?

the contact-tracing czar

What does your audience care about?

- *opening the economy*
- *minimize the number of infected individuals*
- *make contact tracing efficient and effective*

What action does your audience need to take?

- *mandate LGUs to have their own contact tracing platforms that are well-integrated with DOH's database, using the same network construction algorithms across platforms*
- *push for centralization of data*

What is **AT STAKE**?

What are the *benefits* if your audience acts in the way that you want them to?

What are the risks if they do not?

What is **AT STAKE**?

What are the *benefits* if your audience acts in the way that you want them to?

- strengthen one of the important pillars of a pandemic response
- improve contact tracing ratio
- dampen the spread of COVID-19 across communities

What are the risks if they do not?

- we'll always be reactionary
- virus will not be contained

Articulate your **BIG IDEA**.

- (1) Articulate your point of view.
- (2) Convey what is at stake.

Ask our LGUs to use contact tracing applications and ensure they're well-integrated with the DOH and DICT's systems with proper data centralization to improve our pandemic response performance.

PROJECT NAME

Strengthening and Centralizing Contact Tracing Efforts



REPUBLIC OF THE PHILIPPINES
NATIONAL ECONOMIC AND
DEVELOPMENT AUTHORITY

WEBINAR SESSION 10

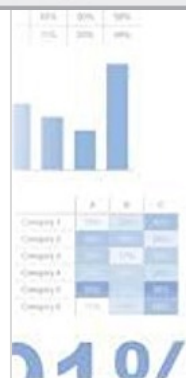
Data Visualization

Guiding Evidence-Based Decision/Polycymaking

Erika Fille T. Legara, PhD

Aboitiz Chair in Data Science

Asian Institute of Management



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storytelling with data

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