

Future of Colstrip lines

Presentation to Montana
ETIC

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State Environmental Policy Manager

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About PGE

Proud 128-year tradition of powering Oregon and serving our customers and communities



877,000
PGE customers

4,100
Square miles in our service territory



1,200 & 26,000
Miles of transmission & distribution lines

16 major generating assets
3,843 MW in total
Hydro, Wind, Natural Gas, Coal and Solar



50% and 75%
We serve 50% of Oregon's population and 75% of the commercial and industrial activity



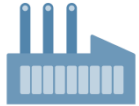
The Future Grid



116 ➔ **Over 220 MW_{DC}**
PV on distribution system



717 ➔ **Over 2,800 MW**
Renewable wind generation



18 / 121 ➔ **250 MW / 150 MW**
Enabled Demand Response &
Dispatchable Standby Generation



1.28 ➔ **100 MWh**
Available energy storage



10,000 ➔ **200,000**
EVs in service territory



865 ➔ **6,500**
Public EV charging stations



4,500 ➔ **100,000**
Integrated customer devices



180,000 ➔ **??**
Voluntary Renewable power
customers

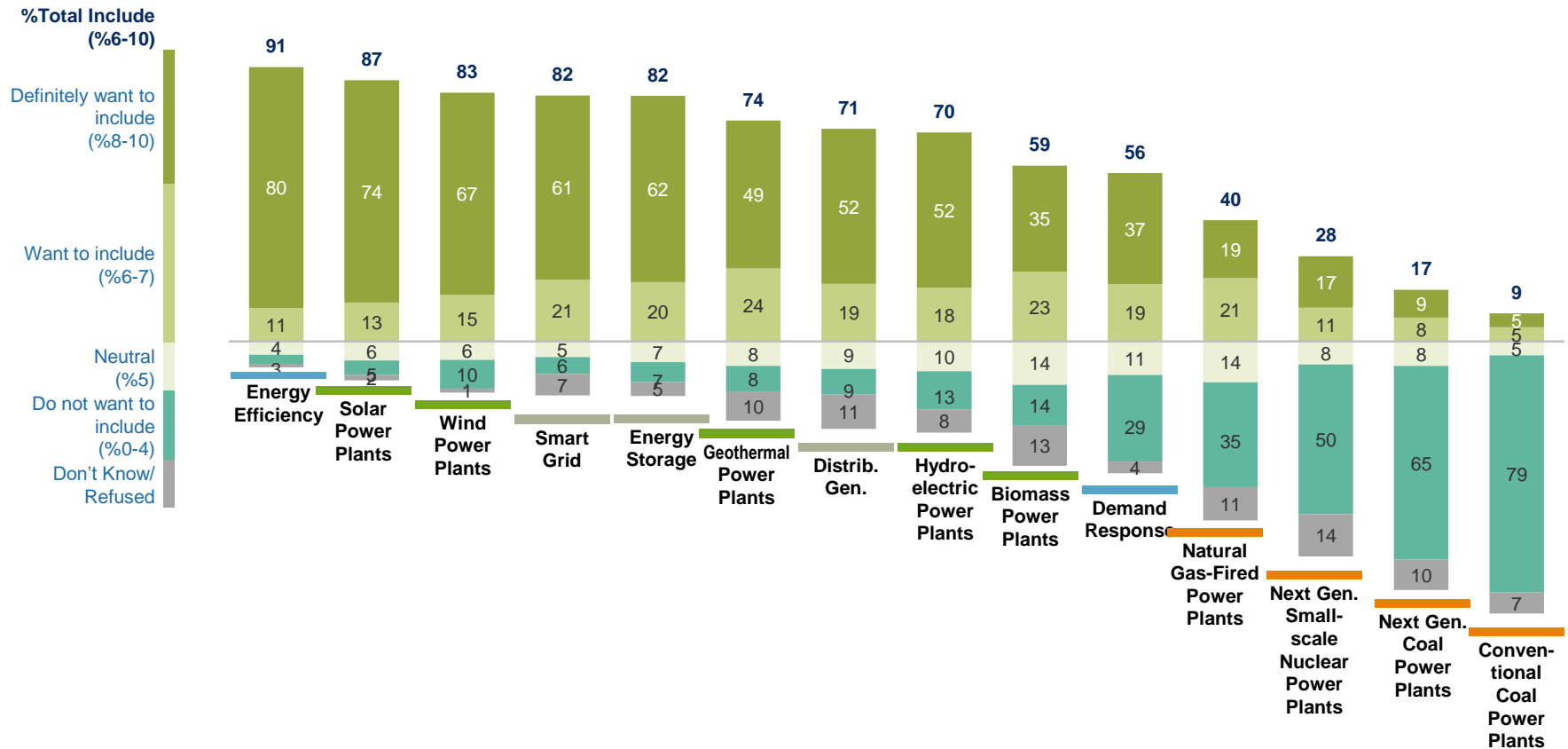


11 million ➔ **?**
Cyber intrusion attempts per week

TODAY ➔ **FUTURE**

Residential Customer Electricity Resource Preferences

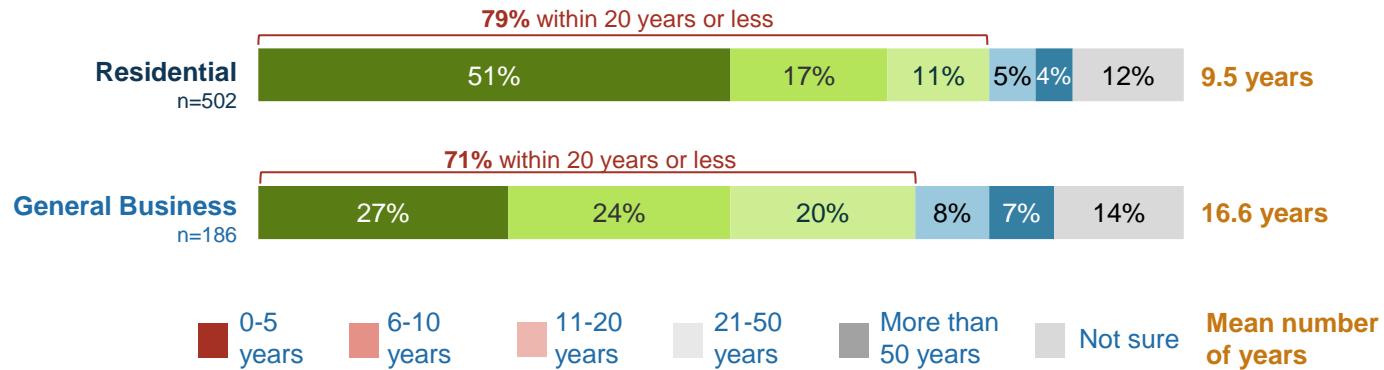
Before reviewing detailed information about each resource, PGE Residential customers indicated a strong preference for energy efficiency and renewable resources over conventional fossil-fuel resources for inclusion in Oregon's future energy supply.



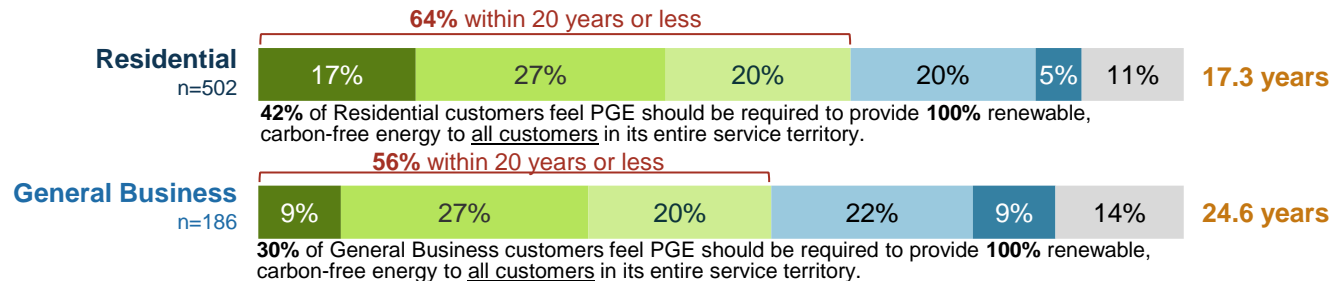
Expected Timeframe for PGE to Provide 100% Renewable Power

Majorities of Residential (64%) and General Business (56%) customers feel that PGE should achieve 100% renewable energy across its entire service territory within 20 years.

Desired Number of Years for PGE to Provide Your Home or Business with 100% Clean and Renewable Energy like Wind, Solar, Geothermal, and Hydropower



Expected Number of Years for PGE to Achieve 100% Renewable Energy Supply for Its Entire Service Territory



Responding to our changing market



Changing customer expectations

Building partnerships, programs and regulatory support to deliver energy solutions and great customer experiences



Pressure to decarbonize

Pursuing new strategies to support customers' desire for a cleaner energy future

***PORTLAND
MULTNOMAH COUNTY***

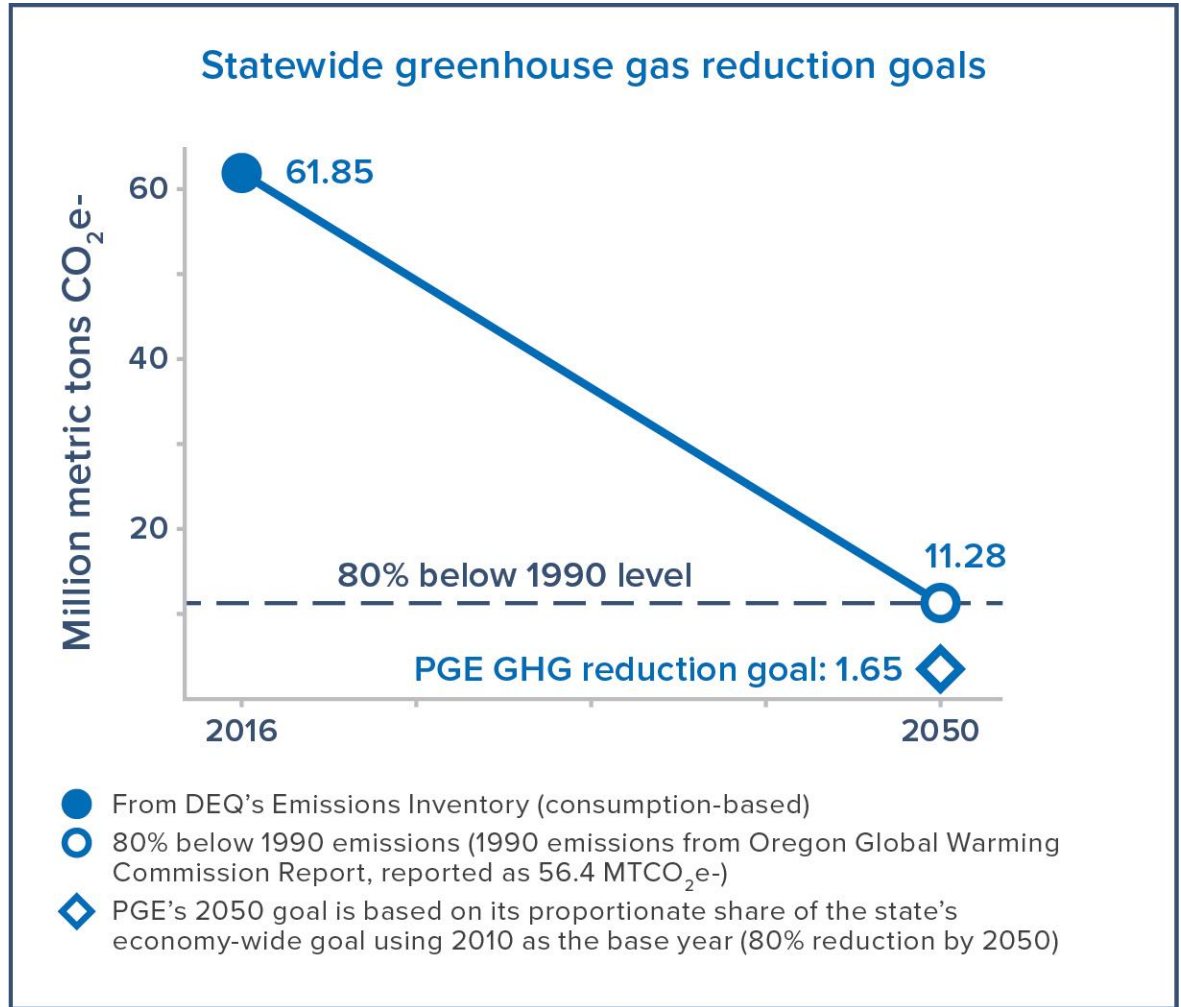


A more integrated Grid

Developing strategies and partnerships to address an increasingly complex system

PGE's Vision for the Future

We must do our part to reduce the threat of climate change

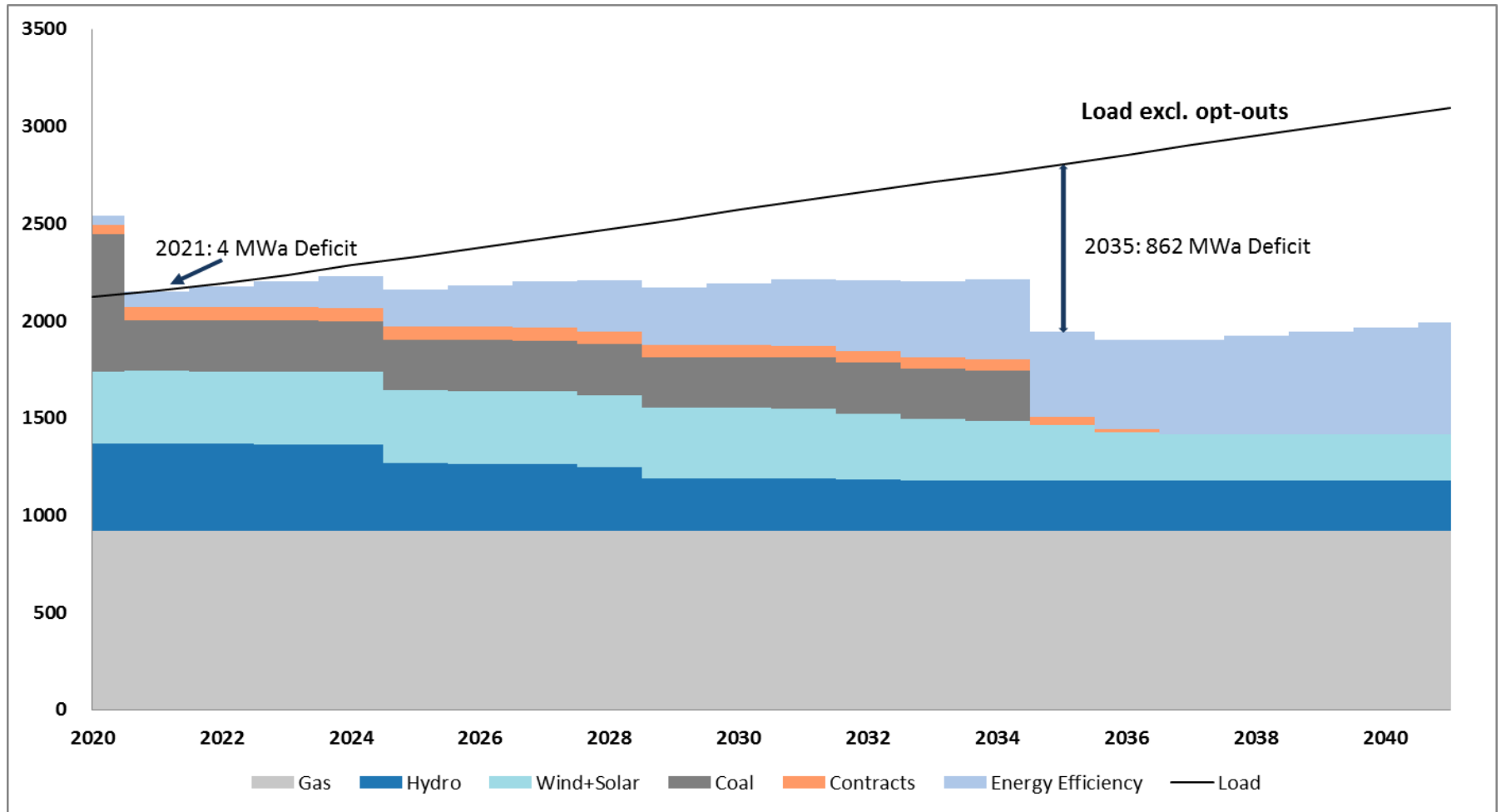


Senate Bill 1547 (2016) Oregon

- Coal provisions apply to Investor-owned utilities.
- “On or before January 1, 2030, an electric company shall eliminate coal-fired resources from its allocation of electricity”
- Fully depreciate coal-fired resources by 2030
- For PGE, we may ask the commission for authority to include coal resources in our portfolio through 2035.



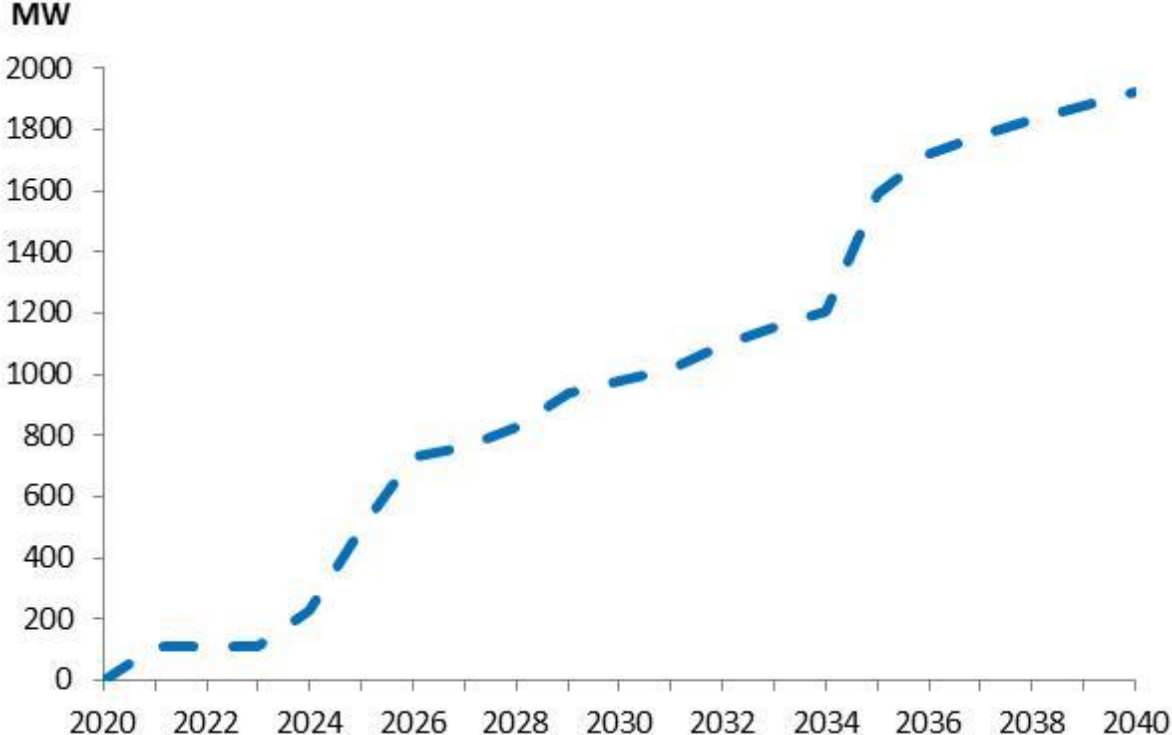
Colstrip remains in IRP planning through 2035



2016 IRP Update

Remaining Annual Capacity Need

PGE's remaining capacity need after actions for EE, DR, DSG, bilateral procurement, executed contracts, and spot market assumptions



Montana Renewables Development Action Plan

- PGE participating in the process and placed Larry Bekkedahl, our VP of transmission and distribution, on the steering committee; staff on other committees
- We are very interested to see what comes from the study of transmission capacity
- Must identify the *value* of renewables in Montana to build more value for transmission out of Montana
 - California is the Saudi Arabia of solar power. Oregon and Washington, the center of hydro. Montana = Wind

Awaiting results from study of transmission capacity

2016 IRP Update

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
5	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
6	0.13	0.11	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.28
7	0.47	0.37	0.32	0.04	0.00	0.00	0.01	0.02	0.03	0.09	0.54	1.13
8	1.88	1.01	0.68	0.09	0.00	0.00	0.03	0.10	0.10	0.16	1.17	2.48
9	3.20	1.73	0.77	0.05	0.01	0.01	0.13	0.39	0.12	0.13	2.12	3.97
10	2.55	1.16	0.53	0.04	0.01	0.04	0.38	0.83	0.17	0.07	1.72	3.60
11	1.88	0.80	0.34	0.02	0.02	0.09	0.81	1.52	0.23	0.05	1.27	2.89
12	1.58	0.51	0.17	0.01	0.03	0.18	1.35	2.33	0.36	0.04	0.99	2.41
13	1.46	0.31	0.09	0.01	0.06	0.33	2.10	3.36	0.53	0.03	0.86	1.79
14	1.19	0.16	0.05	0.00	0.08	0.50	3.08	4.57	0.82	0.02	0.72	1.34
15	0.91	0.13	0.04	0.00	0.11	0.66	3.91	5.57	1.22	0.03	0.62	1.05
16	0.79	0.14	0.03	0.00	0.12	0.86	4.59	6.36	1.65	0.04	0.76	1.40
17	1.27	0.25	0.06	0.00	0.16	1.00	4.78	6.69	1.99	0.09	1.32	3.22
18	3.14	0.66	0.15	0.01	0.16	0.84	4.51	6.71	2.11	0.26	3.01	5.66
19	5.04	1.47	0.40	0.01	0.15	0.58	3.72	6.26	1.96	0.41	4.62	7.40
20	4.86	1.74	0.58	0.02	0.12	0.36	2.84	5.09	1.75	0.35	4.22	6.62
21	3.55	1.23	0.40	0.02	0.06	0.19	1.75	3.75	1.42	0.14	3.01	4.63
22	2.01	0.65	0.12	0.01	0.02	0.07	0.72	2.01	0.38	0.02	1.62	2.60
23	1.08	0.33	0.02	0.00	0.00	0.01	0.03	0.22	0.01	0.00	0.54	1.27
24	0.16	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.08	0.22

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
8	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.06
9	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.06
10	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.03
11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.01
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.01	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.25	0.01	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.41	0.04	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.52	0.06	0.00	0.02	0.02
18	0.01	0.01	0.00	0.00	0.00	0.00	0.06	0.55	0.08	0.00	0.06	0.13
19	0.05	0.02	0.00	0.00	0.00	0.00	0.03	0.47	0.08	0.00	0.14	0.22
20	0.06	0.02	0.00	0.00	0.00	0.00	0.02	0.32	0.05	0.00	0.14	0.16
21	0.04	0.01	0.00	0.00	0.00	0.00	0.01	0.14	0.02	0.00	0.08	0.07
22	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.02	0.02
23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00



Questions?