TALL SOM FORTELLER

Experiences serving API to external users

International PX-meeting 2022

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Introduction

My experiences serving API to external users

1. Some real world API examples
2. Don't reinvent the wheel, open source tools for using our APIs
3. Tools examples
4. Other experiences

Why API?

- We use PxWeb and share the same API, PxWebApi
- API provides access to our statbanks and data through machine to machine communication
- The user can customise the query and data within their own software environment

What is API

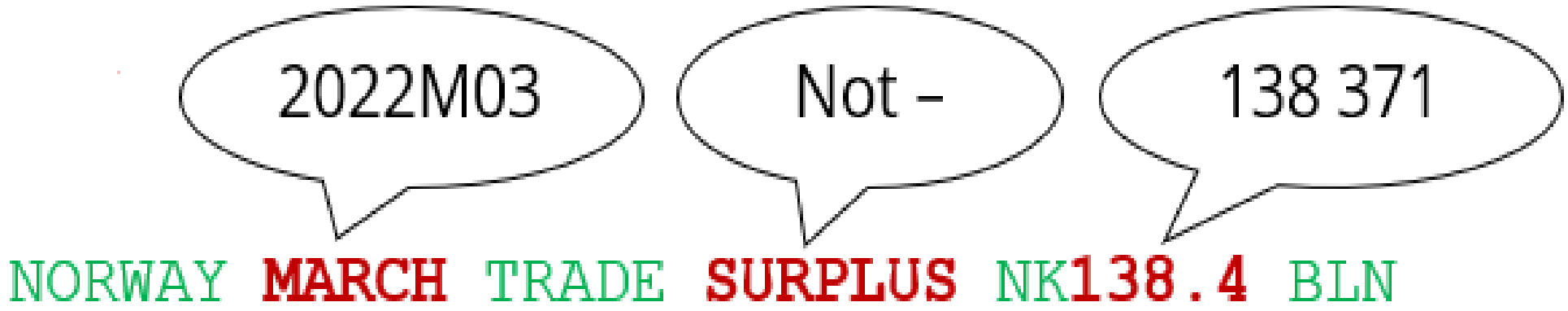
- «APIs enable applications to connect to other applications ***and to data, as well as engage developers and provide the foundations of business ecosystems***. »

Gartner, 2021

Why not just use Saved query?

- Saved query is simple, but not robust
  - Many users are better served with SQ
  - + Has got filter "from"
  - + Possible to pivot table before saving
  - - Hard to debug changes
- API gives much better control and flexiblity

Api example 1 - Bloomberg one-liner



- Data assisted economic journalism

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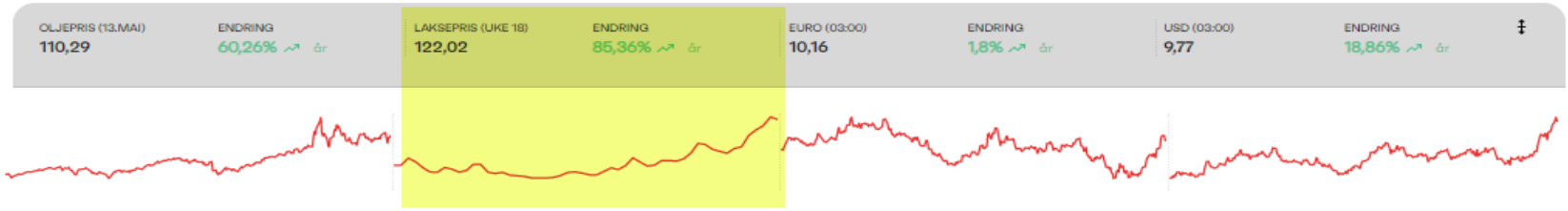
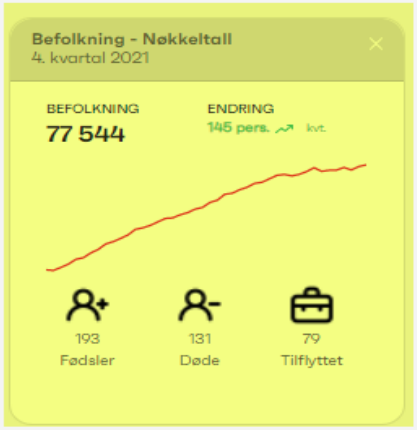
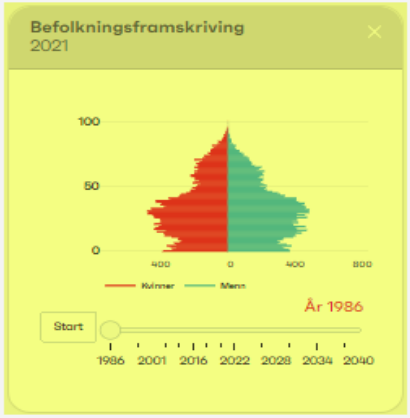
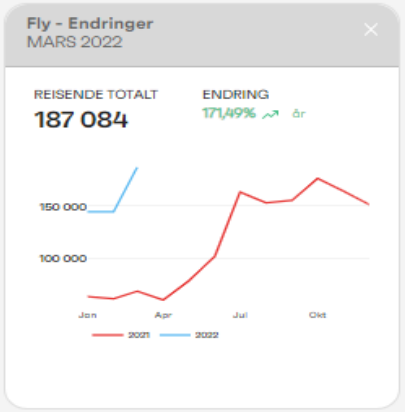
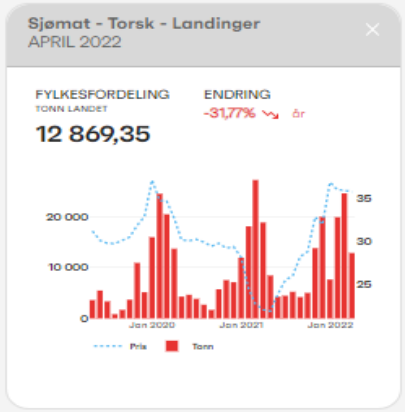
API-example 2 – Knowledge bank Northern Norway

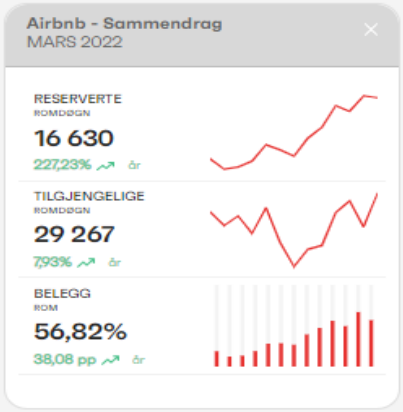












Yellow: SSB API data

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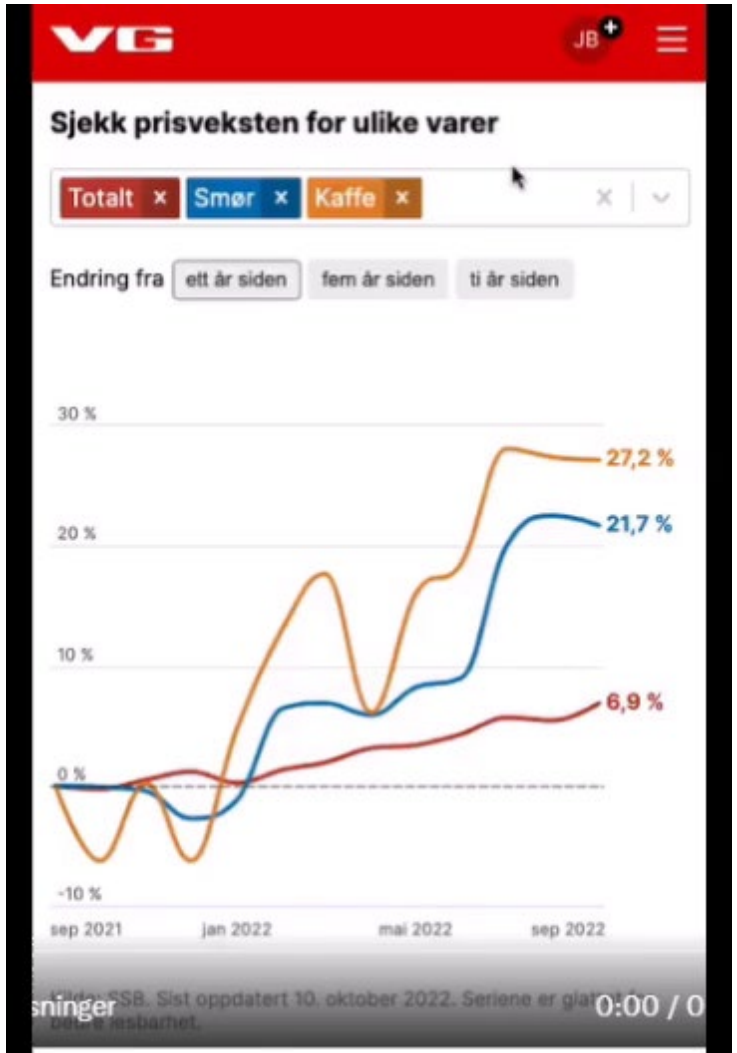
Example 3: CPI – by commodity group



[Link]

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Do not reinvent the wheel

- Reduce learning curve

- Use and improve the Statbank API-tools
  - [Xlsx link]

Annex

A list of tools for utilizing our APIs

Name	API output format	language
rjstat	JSON-stat	R
PxWebApiData	JSON-stat	R
JSON-stat Toolkit	JSON-stat	Javascript
Pyjstat	JSON-stat	Python
jsonstat.py	JSON-stat	Python
Tableau WDC	JSON-stat	Tableau
json-stat.java	JSON-stat	Java
JSONStat.jl	JSON-stat	Julia
Stats-to-pandas	JSON-stat	Python
SSB_API_helper	JSON-stat	Python
PxWebApiData call creator	JSON-stat	R
PxR	Px	R
pyaxis	Px	Python
PxWeb	SCB-JSON	R
pyscbwrapper	SCB-JSON	Python
Q4OpenData	SCB-JSON	Excel/PowerB
getstatbanktable	CSV	SAS

Other links

Name	format	language
Awesome official statistics software		
ERC (Economic RESTful Client)		JavaScript

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Tools example: From PxWeb via API to R

2022M06	Statbank table	0.9	6.3
2022M07			

Footnotes

API query for this table

Send (POST) the following JSON query to the URL belc

URL:

https://data.ssb.no/api/v0/en/table/03013/

JSON query:

```
{
  "query": [
    {
      "code": "Konsumgrp",
      "selection": {
        "filter": "vs:CoiCop2016niva1",
        "values": [
          "TOTAL"
        ]
      }
    },
    {
      "code": "ContentsCode",
      "selection": {
        "filter": "item",
        "values": [
          "KpiIndMnd",
          "Manedsendring",
          "Tolvmanedersendring"
        ]
```

PxWebApiData call creator

This app converts the URL and JSON provided by Statistics Norway into an `ApiData` function call.

The api endpoint URL

https://data.ssb.no/api/v0/en/table/13332/

The API request JSON

```
{
 "query": [
  {
   "code": "Alder",
   "selection": {
    "filter": "item",
    "values": [
     "15-24",
     "25-74"
    ]
```

Paste 1

```
ApiData("https://data.ssb.no/api/v0/en/table/13332/",
    Alder=list('item', c("15-24", "25-74")),
ContentsCode=list('item', c("Arbeidslause2")),
Kjonn=FALSE,
Tid=TRUE)
```

copy 2

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins

Source on Save | Run | Source

```
1  library(PxWebApiData)
2  ApiData("https://data.ssb.no/api/v0/en/table/13332/",
3          Alder=list('item', c("15-24", "25-74")),
4          ContentsCode=list('item', c("Arbeidslause2")),
5          Kjonn=FALSE,
6          Tid=TRUE)
7
```

paste

2:8 (Top Level) R Script

Console Terminal Jobs

R 4.1.1 · ~/

```
[Workspace loaded from ~/.RData]

> library(PxWebApiData)
> ApiData("https://data.ssb.no/api/v0/en/table/13332/",
+         Alder=list('item', c("15-24", "25-74")),
+         ContentsCode=list('item', c("Arbeidslause2")),
+         Kjonn=FALSE,
+         Tid=TRUE)
$`13332: Employment, unemployment, labour force and  break and man-weeks worked for person
s aged 15-74, by age, contents and month`
         age                                                    contents   month value
1   15-24 years Unemployment (LFS) (1 000 persons), seasonally adjusted 2006M02    40
2   15-24 years Unemployment (LFS) (1 000 persons), seasonally adjusted 2006M03    42
3   15-24 years Unemployment (LFS) (1 000 persons), seasonally adjusted 2006M04    42
4   15-24 years Unemployment (LFS) (1 000 persons), seasonally adjusted 2006M05    41
```

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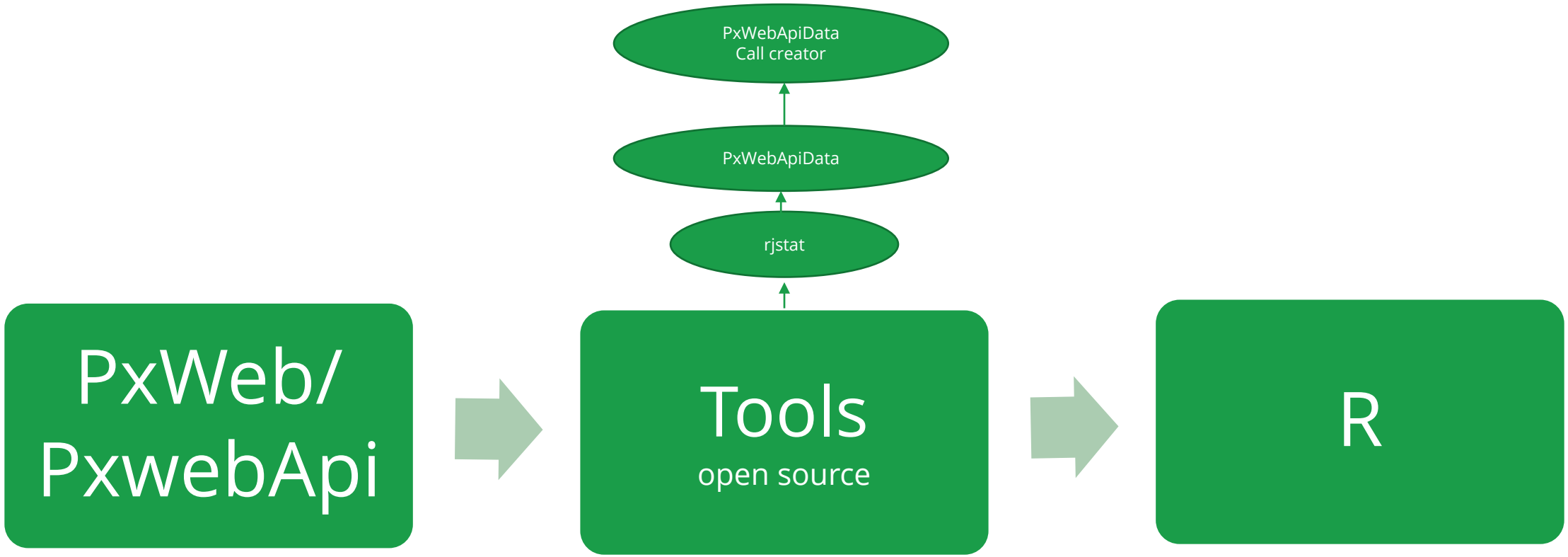
From Statbank via API to application



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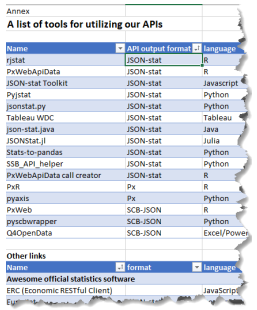
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[Xlsx link]

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Most API users are not professional developers

- To build competence we have done:
  - Help and resource pages.
  - Code examples in R, Python, JavaScript, also as Jupyter notebooks.
  - Half day courses (physical and online) 3-8 times a year, (400 participants)
  - Short and long videos
  - User support by statistikkbanken@ssb.no
  - Mailing list – a few times a year about news and big changes to the tables
  - Participation at user meetings, seminars etc.
  - Hacks – national and local at Statistics Norway
  - Social media (Twitter, LinkedIn)

API is vulnerable

- API is vulnerable both by:
  - API Vendor
  - API Receiver

Vulnerabilities – PxWebApi vendor

- Supplier competence

  - Aviod discontinued tables

  - Avoid unnessecary changes

  - Document breaking changes

Date of change	Statistics	Change
27.10.2022	Number of employments and earnings	Table 13161 is extended with a sector variable. Tables 11652, 11655, 11658 and 12315 are extended with the variables Average age (years) and Average contractual working hours per week (hours).
25.10.2022	Business statistics	Table 12817 is extended with employment groups and with industries P, Q and R plus corresponding sub divisions.
17.10.2022	External trade in goods	Table 08864 is extended with unadjusted figures and more detailed trade flows.
05.10.2022	Child welfare	In tables 13337, 13338 og 13339 the codes for subject have been changed.
28.09.2022	[illegible]	[illegible]

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Vulnerabilities API user

- Competence by user
  - How is the query set up?
  - How to handle breaking changes?
  - Acccuracy is cruical
  - Changes and improvements to tools and formats

Output formats

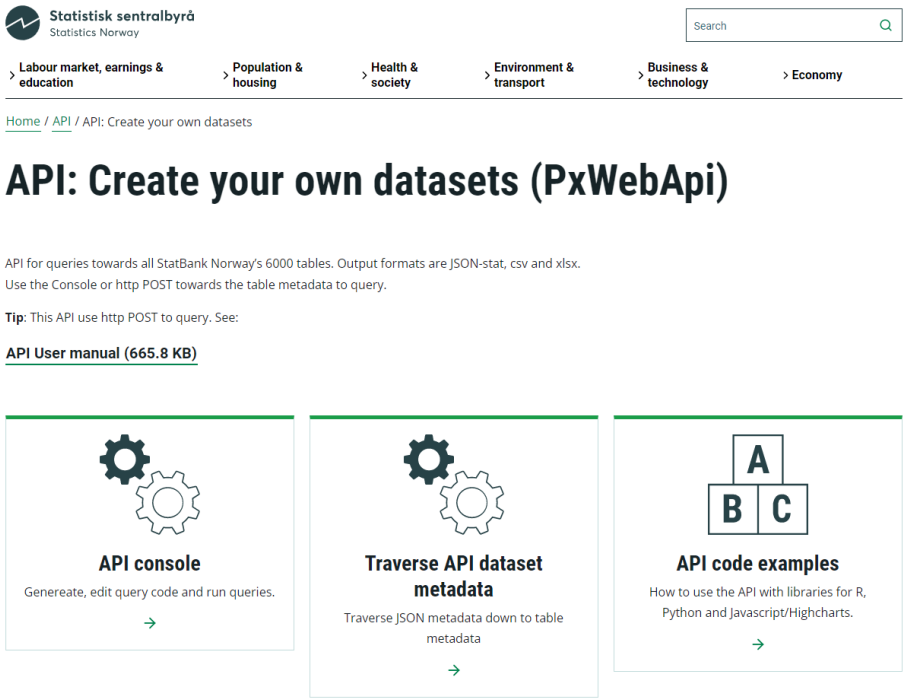
- What should be the main PxWebApi output formats?
  - Lack of agreement on which output formats to promote
  - Should we concentrate on fewer formats?
  - Too few improvements on the serializers / output formats

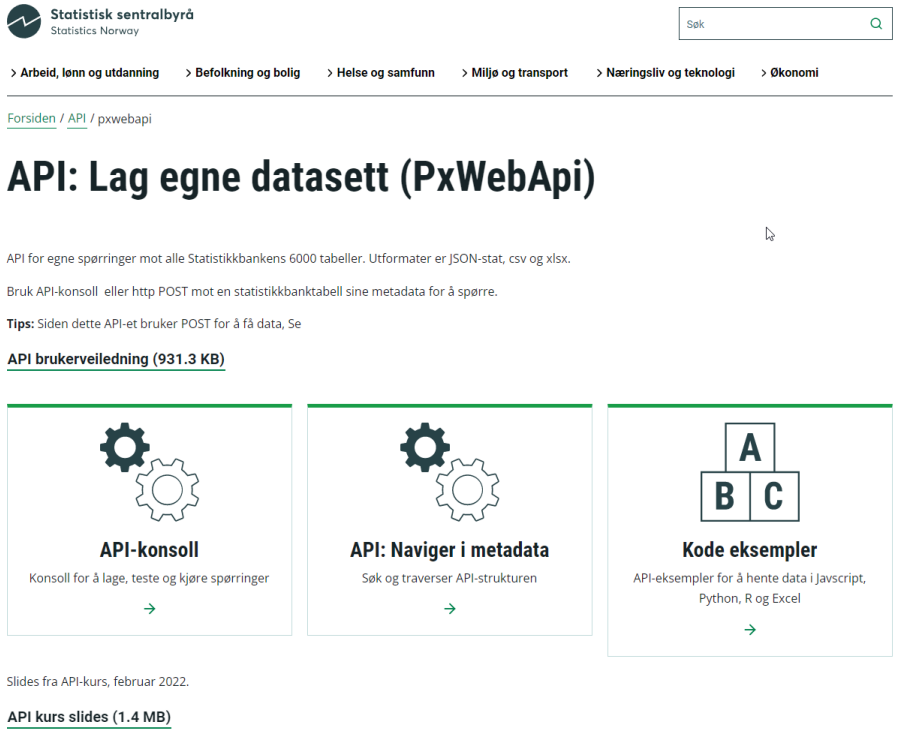
Statistics – use of API

- Figures without cache is best for comparison.
- API users are retrieving larger datasets than Statbank users.
- PxwebApi use without cache

	Number of downloads	Downloaded data cells	Cells pr request
2020	2 486 237	40 559 761 048	16 314
2021	2 638 398	62 208 113 961	23 578

Check out Statistics Norway's API pages, ssb.no/api





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PxWebApi2

1. http GET URL's
   - API query in a link
   - POST will still exist
2. Improved metadata
   1. Metadata also for groupings (agg, vs)

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Thank you!

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