2014-diciembre 2016 ?

In [341]:
```
import pandas as pd
import math
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

In [342]:
```
df = pd.read_csv('argentina merged - Arg_pt2 (1).csv')
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 271 entries, 0 to 270
Data columns (total 5 columns):
 #   Column   Non-Null Count  Dtype  
---  ------   --------------  -----  
 0   year     271 non-null    int64  
 1   month    271 non-null    int64  
 2   ncpi     236 non-null    float64
 3   ex_rate  271 non-null    float64
 4   m2       271 non-null    float64
dtypes: float64(3), int64(2)
memory usage: 10.7 KB
```

In [343]:
```
pd.set_option('display.max_rows', df.shape[0]+1)
print(df)
```

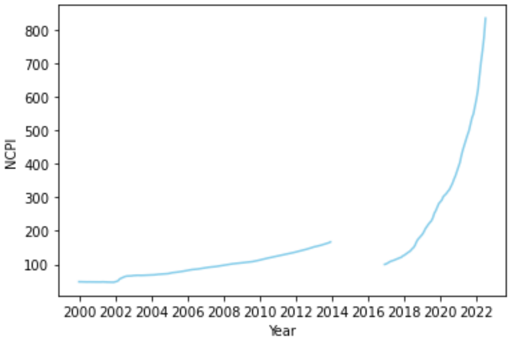
```
     year  month      ncpi    ex_rate            m2
0    2000      1  48.09879    0.99900  2.958935e+04
1    2000      2  48.10076    0.99900  2.877582e+04
2    2000      3  47.84662    0.99900  2.907953e+04
3    2000      4  47.79282    0.99900  2.876504e+04
4    2000      5  47.60705    0.99900  2.920590e+04
5    2000      6  47.51903    0.99900  3.001776e+04
6    2000      7  47.72541    0.99900  2.960987e+04
7    2000      8  47.62273    0.99900  2.914851e+04
8    2000      9  47.54960    0.99900  2.940293e+04
9    2000     10  47.63481    0.99900  2.845849e+04
10   2000     11  47.40065    0.99900  2.813883e+04
11   2000     12  47.34766    0.99900  3.004754e+04
12   2001      1  47.38574    0.99900  2.880066e+04
13   2001      2  47.27780    0.99900  2.912824e+04
14   2001      3  47.36788    0.99900  2.579778e+04
15   2001      4  47.68451    0.99900  2.691109e+04
16   2001      5  47.71537    0.99900  2.640372e+04
17   2001      6  47.37121    0.99900  2.634358e+04
18   2001      7  47.21637    0.99900  2.403303e+04
```

In [344]:
```
df['year'] = df['year'].astype(str)
df['month'] = df['month'].astype(str)

df['m2_usd'] = df['m2']/df['ex_rate']

df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 271 entries, 0 to 270
Data columns (total 6 columns):
 #   Column   Non-Null Count  Dtype  
---  ------   --------------  -----  
 0   year     271 non-null    object 
 1   month    271 non-null    object 
 2   ncpi     236 non-null    float64
 3   ex_rate  271 non-null    float64
 4   m2       271 non-null    float64
 5   m2_usd   271 non-null    float64
dtypes: float64(4), object(2)
memory usage: 12.8+ KB
```

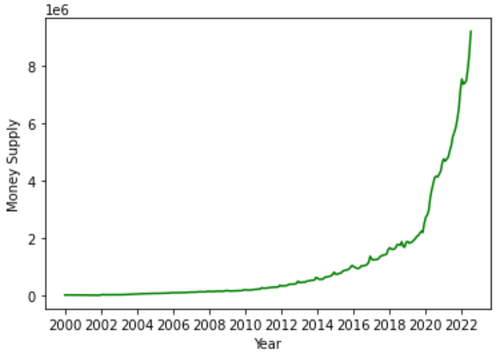
```
In [345]: plt.xticks([0,24,48,72,96,120,144,168,192,216,240,264], ['2000',"2002","2004","2006","2008","2010","2012","2014","2016","2018", '
          plt.xlabel("Year")
          plt.ylabel("NCPI")

          df["ncpi"].plot(color="skyblue")
```

```
Out[345]: <AxesSubplot:xlabel='Year', ylabel='NCPI'>
```



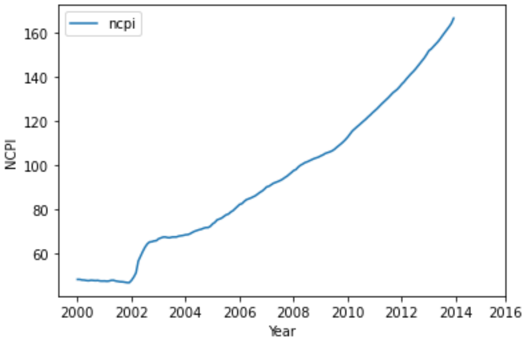
```
In [346]: plt.xticks([0,24,48,72,96,120,144,168,192,216,240,264], ['2000',"2002","2004","2006","2008","2010","2012","2014","2016","2018", '
          plt.xlabel("Year")
          plt.ylabel("Money Supply")


          df["m2"].plot(color='green')
```

```
Out[346]: <AxesSubplot:xlabel='Year', ylabel='Money Supply'>
```



```
In [347]: df["ncpi"].iloc[0:203].plot()
          plt.xticks([0,24,48,72,96,120,144,168,190], ['2000',"2002","2004","2006","2008","2010","2012","2014","2016"])
          plt.legend(loc='upper left')
          plt.xlabel("Year")
          plt.ylabel("NCPI")
```

```
Out[347]: Text(0, 0.5, 'NCPI')
```



In [348]:

```
df
```

Out[348]:

	year	month	ncpi	ex_rate	m2	m2_usd
0	2000	1	48.09879	0.99900	2.958935e+04	29618.972973
1	2000	2	48.10076	0.99900	2.877582e+04	28804.628218
2	2000	3	47.84662	0.99900	2.907953e+04	29108.641762
3	2000	4	47.79282	0.99900	2.876504e+04	28793.836897
4	2000	5	47.60705	0.99900	2.920590e+04	29235.134775
5	2000	6	47.51903	0.99900	3.001776e+04	30047.806036
6	2000	7	47.72541	0.99900	2.960987e+04	29639.510490
7	2000	8	47.62273	0.99900	2.914851e+04	29177.691832
8	2000	9	47.54960	0.99900	2.940293e+04	29432.364234
9	2000	10	47.63481	0.99900	2.845849e+04	28486.976937
10	2000	11	47.40065	0.99900	2.813883e+04	28166.993373

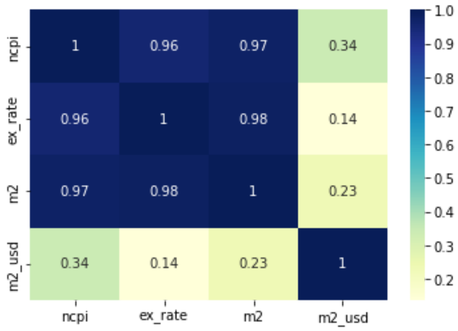
In [349]:

```
numeric_features = df.select_dtypes(include=[np.number])
corr = numeric_features.corr()
print (corr['ncpi'].sort_values(ascending=False)[:10], '\n')
```

```
ncpi       1.000000
m2         0.974690
ex_rate    0.955132
m2_usd     0.340189
Name: ncpi, dtype: float64
```

In [350]:

```
corr_matrix = df.corr()
sns.heatmap(corr_matrix, annot=True, cmap="YlGnBu")


plt.show()
```



In [358]:

```
df["m2_pctchange"]=df["m2"].pct_change()+1
df["inflation"]=100*df["ncpi"].pct_change()

df["inflation"]=df["inflation"].round(decimals = 2)
df["m2_pctchange"]=df["m2_pctchange"].round(decimals = 2)
df["ncpi"]=df["ncpi"].round(decimals = 2)
df["ncpi"]=df["ncpi"].round(decimals = 2)
```

In [359]:

```
while df['ncpi'].isna().sum() > 0:
    df.loc[df['ncpi'].isna(), 'ncpi'] = df['ncpi'].shift(1) * df['m2_pctchange']
```

In [360]:
```
df
```

```
235  2019   8  238.30  59.07500  2.092441e+06  35420.077190  1.02  3.88
236  2019   9  252.10  57.55830  2.171913e+06  37734.148333  1.04  5.79
237  2019  10  260.20  59.72670  2.238035e+06  37471.265950  1.03  3.21
238  2019  11  270.80  59.86330  2.198823e+06  36730.728677  0.98  4.07
239  2019  12  281.20  59.89500  2.512309e+06  41945.216462  1.14  3.84
240  2020   1  286.50  60.33120  2.728223e+06  45220.767364  1.09  1.88
241  2020   2  291.70  62.20800  2.804026e+06  45075.011413  1.03  1.82
242  2020   3  302.20  64.46970  2.970752e+06  46079.815324  1.06  3.60
243  2020   4  306.40  66.83500  3.399888e+06  50869.874617  1.14  1.39
244  2020   5  311.10  68.53500  3.682704e+06  53734.649303  1.08  1.53
245  2020   6  317.50  70.45500  3.910094e+06  55497.753176  1.06  2.06
246  2020   7  322.70  72.31500  4.113985e+06  56889.793957  1.05  1.64
247  2020   8  331.70  74.17500  4.151495e+06  55968.928345  1.01  2.79
```

In [361]:
```
df=df.replace([-67.92], 0)
```

In [362]:
```
#inf 2013
df["inflation"].iloc[156:168].sum()
```

Out[362]:
```
10.45
```

In [363]:
```
#Inf 2014
df["inflation"].iloc[168:180].sum()
```

Out[363]:
```
27.0
```

In [364]:
```
#inf 2015
df["inflation"].loc[180:191].sum()
```

Out[364]:
```
28.0
```

In [365]:
```
#inf 2016

df["inflation"].loc[192:202].sum()
```

Out[365]:
```
11.0
```

In [366]:
```
#inf 2017

df["inflation"].loc[203:215].sum().round(decimals = 2)
```

Out[366]:
```
22.55
```

In [367]:
```
#inf 2018

df["inflation"].loc[216:227].sum()
```

Out[367]:
```
39.36
```

In [368]:
```
#inf acumulada 2014-2016
df["inflation"].loc[156:202].sum().round(decimals = 2)
```

Out[368]:
```
76.45
```

In [369]:
```
df.loc[216:227]
```

Out[369]:

	year	month	ncpi	ex_rate	m2	m2_usd	m2_pctchange	inflation
216	2018	1	127.0	19.6525	1671370.26	85046.190561	1.04	1.60
217	2018	2	130.3	20.1150	1625844.54	80827.469053	0.97	2.60
218	2018	3	133.5	20.1433	1614610.84	80156.222665	0.99	2.46
219	2018	4	136.9	20.6917	1621338.59	78356.954238	1.00	2.55
220	2018	5	139.6	24.9475	1671509.20	67001.070248	1.03	1.97
221	2018	6	145.1	28.8617	1776575.23	61554.767391	1.06	3.94
222	2018	7	149.1	27.3425	1774779.85	64909.201792	1.00	2.76
223	2018	8	155.2	37.1250	1759405.38	47391.390707	0.99	4.09
224	2018	9	165.5	40.8967	1877613.23	45911.118256	1.07	6.64
225	2018	10	173.9	36.1967	1714007.75	47352.597060	0.91	5.08
226	2018	11	178.9	38.0217	1689885.17	44445.281773	0.99	2.88
227	2018	12	183.9	37.8083	1863685.87	49293.035392	1.10	2.79

In [370]:
```
df=df.replace([-67.92], 0)
```

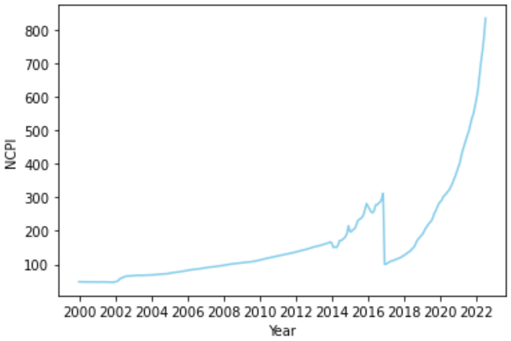
In [371]:
```
df
```

Out[371]:

	year	month	ncpi	ex_rate	m2	m2_usd	m2_pctchange	inflation
0	2000	1	48.10	0.99900	2.958935e+04	29618.972973	NaN	NaN
1	2000	2	48.10	0.99900	2.877582e+04	28804.628218	0.97	0.00
2	2000	3	47.85	0.99900	2.907953e+04	29108.641762	1.01	-0.52
3	2000	4	47.79	0.99900	2.876504e+04	28793.836897	0.99	-0.13
4	2000	5	47.61	0.99900	2.920590e+04	29235.134775	1.02	-0.38
5	2000	6	47.52	0.99900	3.001776e+04	30047.806036	1.03	-0.19
6	2000	7	47.73	0.99900	2.960987e+04	29639.510490	0.99	0.44
7	2000	8	47.62	0.99900	2.914851e+04	29177.691832	0.98	-0.23
8	2000	9	47.55	0.99900	2.940293e+04	29432.364234	1.01	-0.15
9	2000	10	47.63	0.99900	2.845849e+04	28486.976937	0.97	0.17
10	2000	11	47.40	0.99900	2.813883e+04	28166.993373	0.99	-0.48

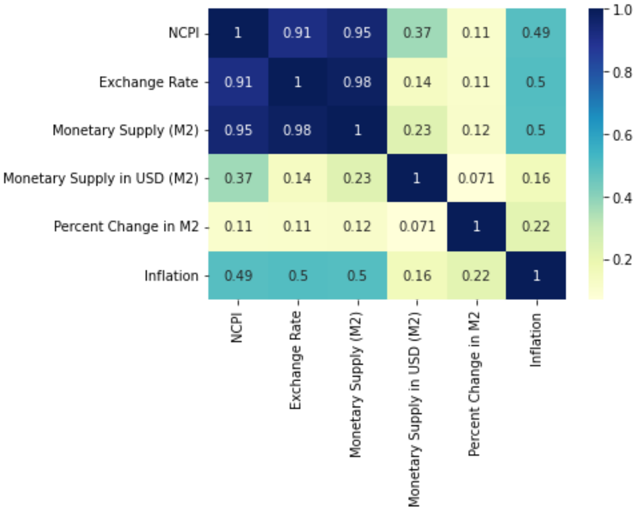
In [372]:
```
df["ncpi"].plot(color='skyblue')
plt.xticks([0,24,48,72,96,120,144,168,192,216,240,264], ['2000',"2002","2004","2006","2008","2010","2012","2014","2016","2018", '
plt.xlabel("Year")
plt.ylabel("NCPI")
```

Out[372]:
```
Text(0, 0.5, 'NCPI')
```



In [373]:

```
import matplotlib.pyplot as plt
import seaborn as sns

df = df.rename(columns={"ncpi": "NCPI", "ex_rate": "Exchange Rate", "m2": "Monetary Supply (M2)", "m2_usd": "Monetary Supply in U
corr_matrix = df.corr()
sns.heatmap(corr_matrix, annot=True, cmap="YlGnBu")
plt.show()
```

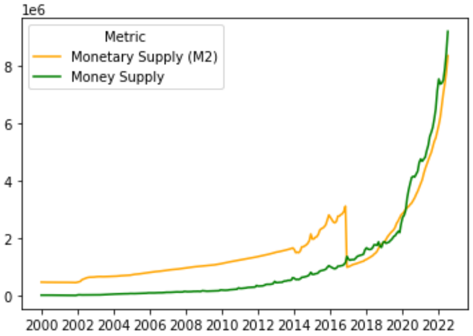


In [374]:

```
plt.plot(10000*df['NCPI'], label='Monetary Supply (M2)', color='orange')
plt.plot(df['Monetary Supply (M2)'], label='Money Supply', color='green')
plt.xticks([0,24,48,72,96,120,144,168,192,216,240,264], ['2000','2002',"2004","2006","2008","2010","2012","2014","2016","2018", '

plt.legend(loc='upper left', title='Metric')
```

Out[374]:

```
<matplotlib.legend.Legend at 0x25fa704d820>
```

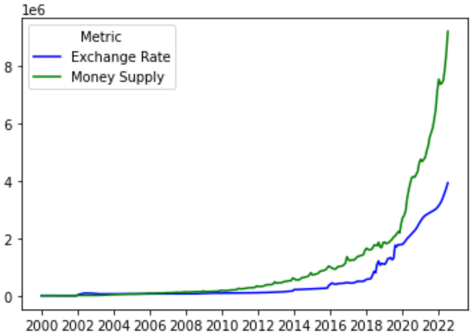


In [375]:

```
plt.plot(30000*df['Exchange Rate'], label='Exchange Rate', color='blue')
plt.plot(df['Monetary Supply (M2)'], label='Money Supply', color='green')
plt.xticks([0,24,48,72,96,120,144,168,192,216,240,264], ['2000','2002',"2004","2006","2008","2010","2012","2014","2016","2018", '

plt.legend(loc='upper left', title='Metric')
```

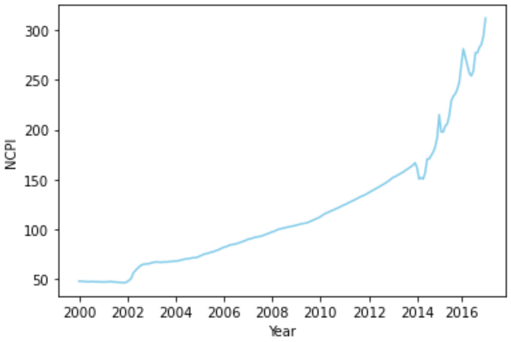
Out[375]:

```
<matplotlib.legend.Legend at 0x25fa705c0a0>
```



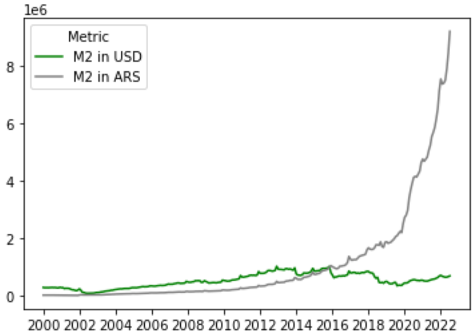
In [376]:
```
df["NCPI"].iloc[0:203].plot(color='skyblue')
plt.xticks([0,24,48,72,96,120,144,168,190], ['2000',"2002","2004","2006","2008","2010","2012","2014","2016"])
plt.xlabel("Year")
plt.ylabel("NCPI")
```

Out[376]:
```
Text(0, 0.5, 'NCPI')
```



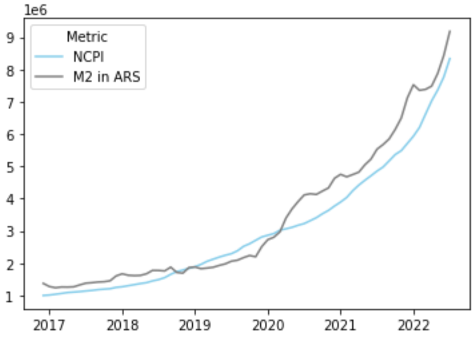
In [377]:
```
plt.plot(10*df['Monetary Supply in USD (M2)'], label='M2 in USD', color='green')
plt.plot(df['Monetary Supply (M2)'], label='M2 in ARS', color='grey')
plt.xticks([0,24,48,72,96,120,144,168,192,216,240,264], ['2000',"2002","2004","2006","2008","2010","2012","2014","2016","2018", '

plt.legend(loc='upper left', title='Metric')
```

Out[377]:
```
<matplotlib.legend.Legend at 0x25fa6f526a0>
```



In [378]:
```
plt.plot(10000*df["NCPI"].iloc[203:], label='NCPI', color='skyblue')
plt.plot(df['Monetary Supply (M2)'].iloc[203:], label='M2 in ARS', color='grey')
plt.xticks([204,216,228,240,252,264], ["2017","2018","2019", "2020","2021","2022"])
plt.legend(loc='upper left', title='Metric')
```

Out[378]:
```
<matplotlib.legend.Legend at 0x25fa7141490>
```


1e6
Metric
NCPI
M2 in ARS