Introduction to gganimate

Unemployment in Europe

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Getting Started

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Showing the steps to create an animated bar chart can be tricky.In order to demonstrate the steps required to build this animated plot we will:

- Build the skeleton of the plot (declare aesthetics and build the theme and annotations)
- Then use facet_wrap() and declare the geoms to show the different bar lengths at each time period

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Showing the steps to create an animated bar chart can be tricky.In order to demonstrate the steps required to build this animated plot we will:

- Build the skeleton of the plot (declare aesthetics and build the theme and annotations)
- Then use facet_wrap() and declare the geoms to show the different bar lengths at each time period
- Finally we will combine the plots and add the animation

Data Manipulation

```
unemployment
```

```
## # A tibble: 810 x 5
##    LOCATION Country SUBJECT  TIME Value
##    <chr>    <chr>   <chr>   <dbl> <dbl>
##  1 AUT      Austria TOT      1999  4.97
##  2 AUT      Austria TOT      2000  5.15
##  3 AUT      Austria TOT      2001  5.7
##  4 AUT      Austria TOT      2002  6.18
##  5 AUT      Austria TOT      2003  7.05
##  6 AUT      Austria TOT      2004 10.5
##  7 AUT      Austria TOT      2005 11.0
##  8 AUT      Austria TOT      2006  9.8
##  9 AUT      Austria TOT      2007  9.38
## 10 AUT      Austria TOT      2008  8.48
## # … with 800 more rows
```

Data Manipulation

```
unemployment %>%
  filter(SUBJECT == "TOT")
```

```
## # A tibble: 271 x 5
##    LOCATION Country SUBJECT  TIME Value
##    <chr>    <chr>   <chr>   <dbl> <dbl>
##  1 AUT      Austria TOT      1999  4.97
##  2 AUT      Austria TOT      2000  5.15
##  3 AUT      Austria TOT      2001  5.7
##  4 AUT      Austria TOT      2002  6.18
##  5 AUT      Austria TOT      2003  7.05
##  6 AUT      Austria TOT      2004 10.5
##  7 AUT      Austria TOT      2005 11.0
##  8 AUT      Austria TOT      2006  9.8
##  9 AUT      Austria TOT      2007  9.38
## 10 AUT      Austria TOT      2008  8.48
## # … with 261 more rows
```

Data Manipulation

```
unemployment %>%
  filter(SUBJECT == "TOT") %>%
  filter(TIME>=2007)
```

```
## # A tibble: 164 x 5
##    LOCATION Country SUBJECT  TIME Value
##    <chr>    <chr>   <chr>   <dbl> <dbl>
##  1 AUT      Austria TOT      2007  9.38
##  2 AUT      Austria TOT      2008  8.48
##  3 AUT      Austria TOT      2009 10.6
##  4 AUT      Austria TOT      2010  9.48
##  5 AUT      Austria TOT      2011  8.95
##  6 AUT      Austria TOT      2012  9.4
##  7 AUT      Austria TOT      2013  9.68
##  8 AUT      Austria TOT      2014 10.3
##  9 AUT      Austria TOT      2015 10.6
## 10 AUT      Austria TOT      2016 11.2
## # … with 154 more rows
```

Data Manipulation

```
unemployment %>%
  filter(SUBJECT == "TOT") %>%
  filter(TIME>=2007) %>%
  filter(Country!= "Estonia")
```

```
## # A tibble: 154 x 5
##    LOCATION Country SUBJECT  TIME Value
##    <chr>    <chr>   <chr>   <dbl> <dbl>
##  1 AUT      Austria TOT      2007  9.38
##  2 AUT      Austria TOT      2008  8.48
##  3 AUT      Austria TOT      2009 10.6
##  4 AUT      Austria TOT      2010  9.48
##  5 AUT      Austria TOT      2011  8.95
##  6 AUT      Austria TOT      2012  9.4
##  7 AUT      Austria TOT      2013  9.68
##  8 AUT      Austria TOT      2014 10.3
##  9 AUT      Austria TOT      2015 10.6
## 10 AUT      Austria TOT      2016 11.2
## # … with 144 more rows
```

Data Manipulation

```
unemployment %>%
  filter(SUBJECT == "TOT") %>%
  filter(TIME>=2007) %>%
  filter(Country!= "Estonia")%>%
  select(-LOCATION)
```

```
## # A tibble: 154 x 4
##    Country SUBJECT  TIME Value
##    <chr>   <chr>   <dbl> <dbl>
##  1 Austria TOT      2007  9.38
##  2 Austria TOT      2008  8.48
##  3 Austria TOT      2009 10.6
##  4 Austria TOT      2010  9.48
##  5 Austria TOT      2011  8.95
##  6 Austria TOT      2012  9.4
##  7 Austria TOT      2013  9.68
##  8 Austria TOT      2014 10.3
##  9 Austria TOT      2015 10.6
## 10 Austria TOT      2016 11.2
## # … with 144 more rows
```

Data Manipulation

```
unemployment %>%
  filter(SUBJECT == "TOT") %>%
  filter(TIME>=2007) %>%
  filter(Country!= "Estonia")%>%
  select(-LOCATION) %>%
  select(-SUBJECT)
```

```
## # A tibble: 154 x 3
##    Country  TIME Value
##    <chr>   <dbl> <dbl>
##  1 Austria  2007  9.38
##  2 Austria  2008  8.48
##  3 Austria  2009 10.6
##  4 Austria  2010  9.48
##  5 Austria  2011  8.95
##  6 Austria  2012  9.4
##  7 Austria  2013  9.68
##  8 Austria  2014 10.3
##  9 Austria  2015 10.6
## 10 Austria  2016 11.2
## # … with 144 more rows
```

Data Manipulation

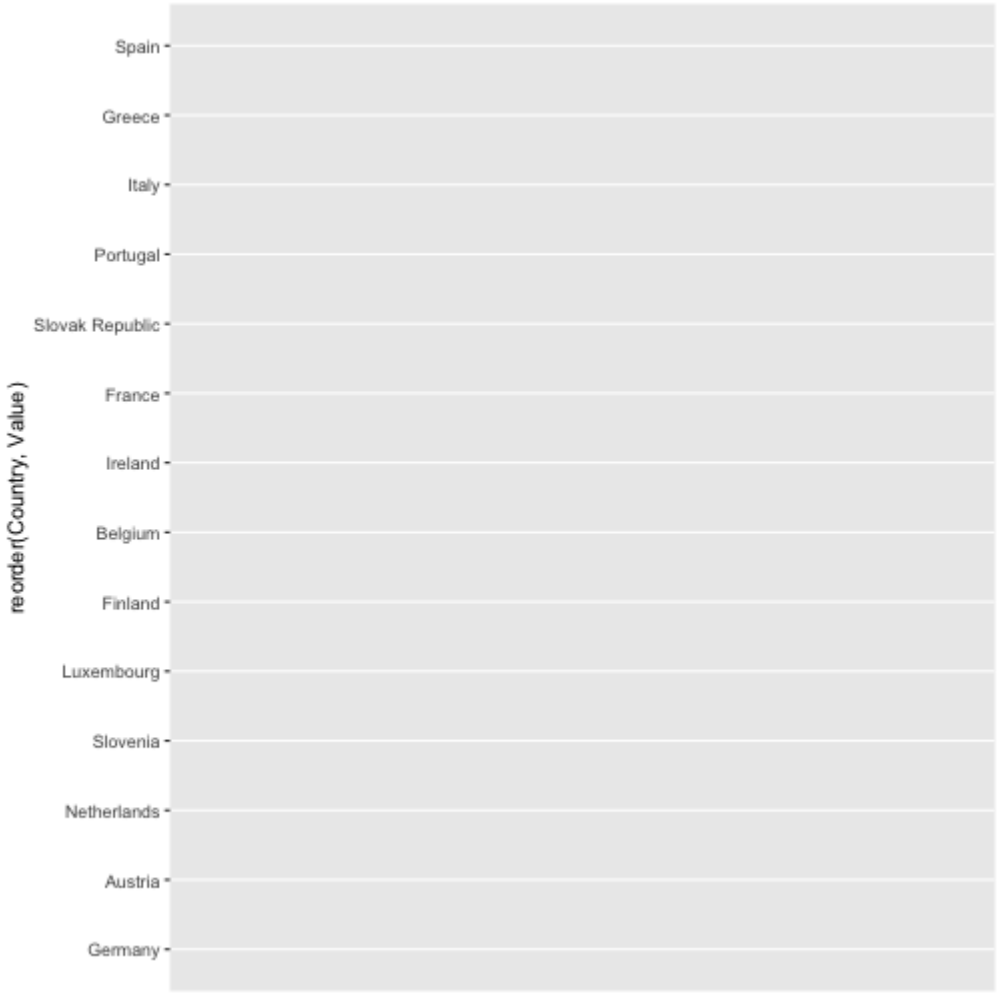
```
unemployment %>%
  filter(SUBJECT == "TOT") %>%
  filter(TIME>=2007) %>%
  filter(Country!= "Estonia")%>%
  select(-LOCATION) %>%
  select(-SUBJECT) ->
  plotdata
```

Building the Plot

```
ggplot(data = plotdata)
```

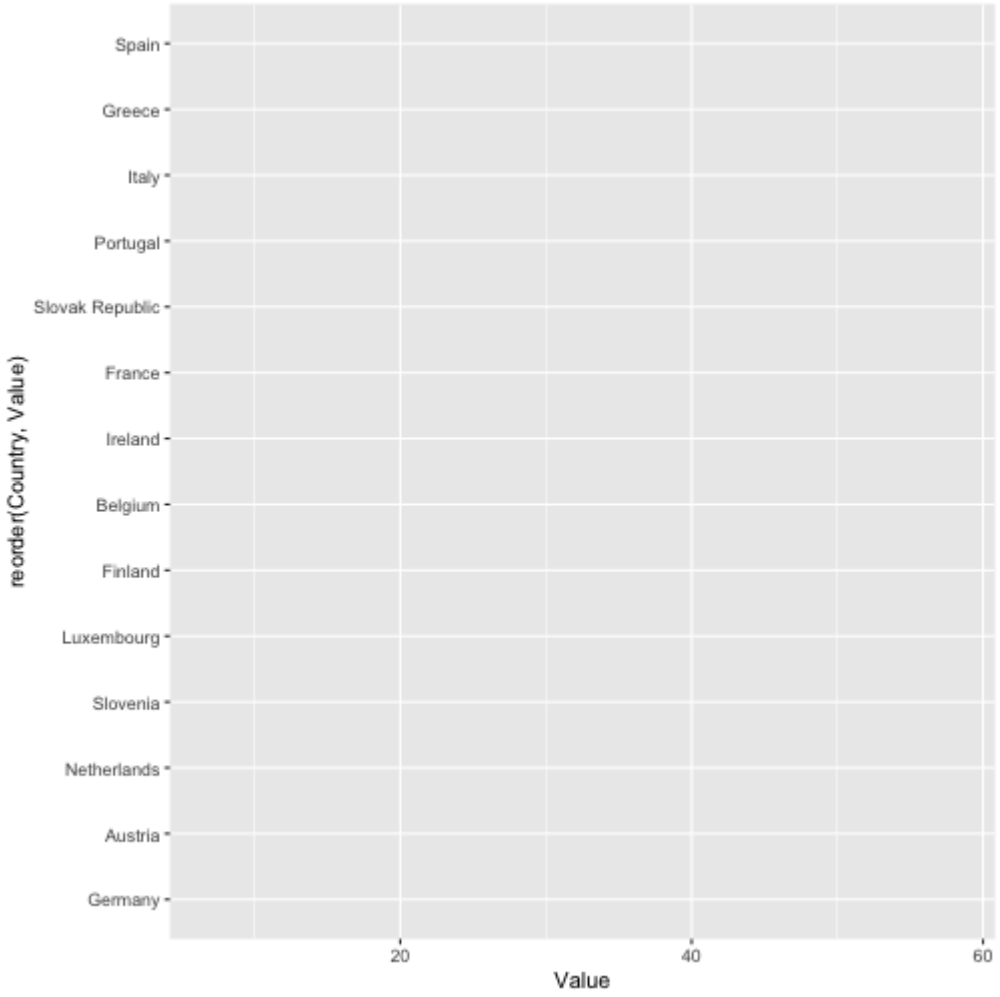
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))
```



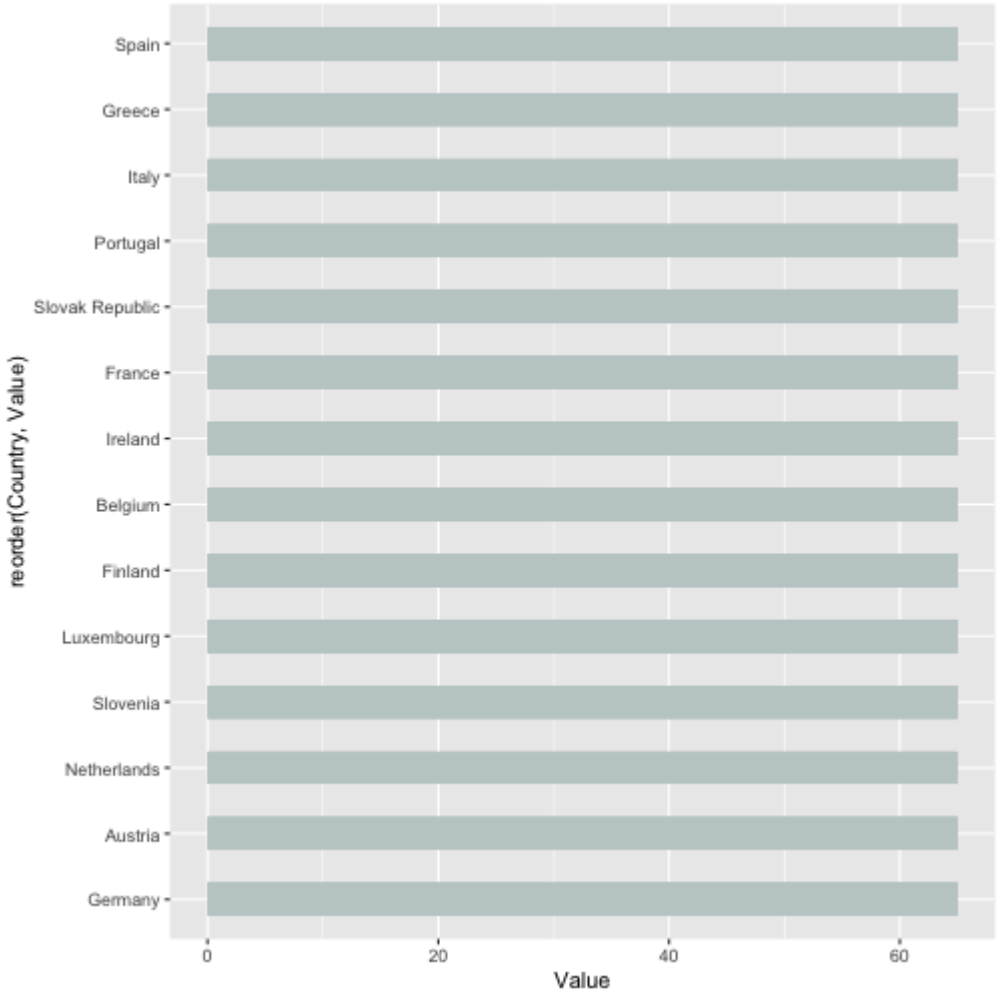
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)
```



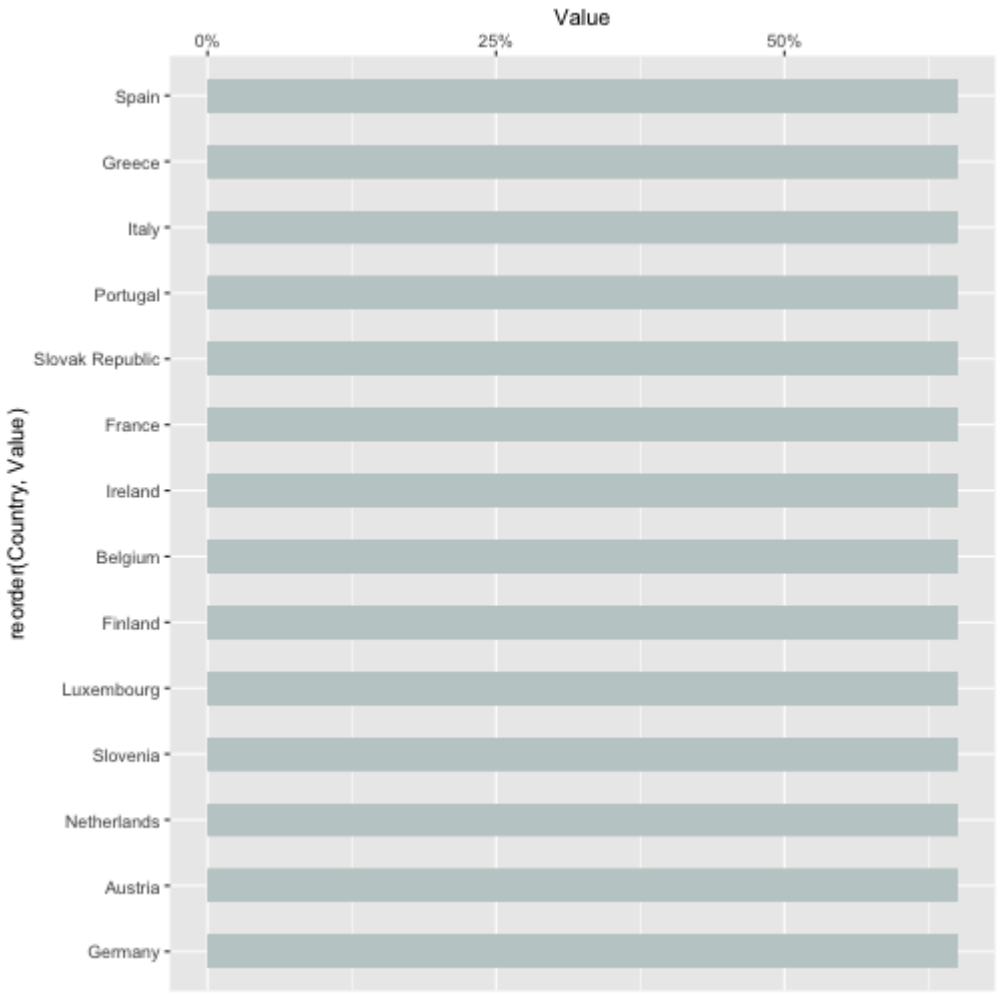
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")
```



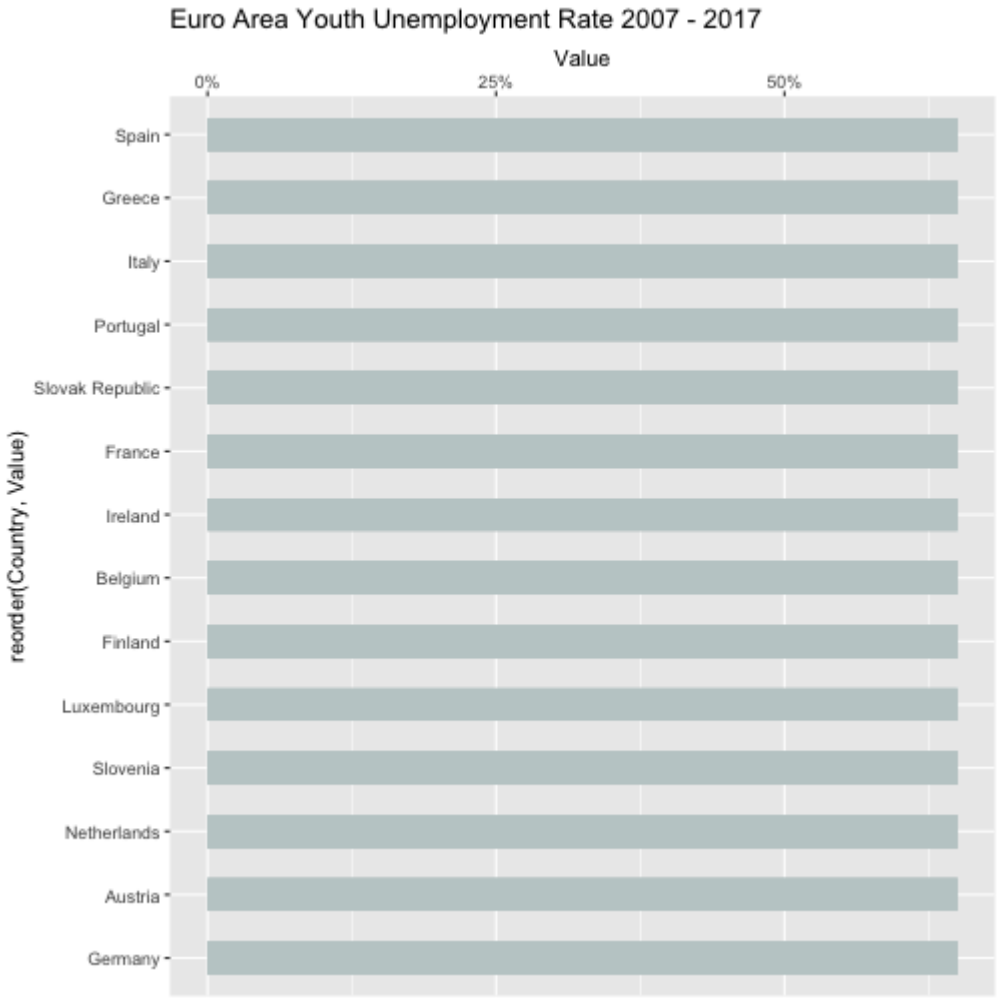
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")+
  scale_x_continuous(position = "top",
                     breaks = c(0, 25, 50),
                     labels=
                       function(x) paste0(x,"%"))
```



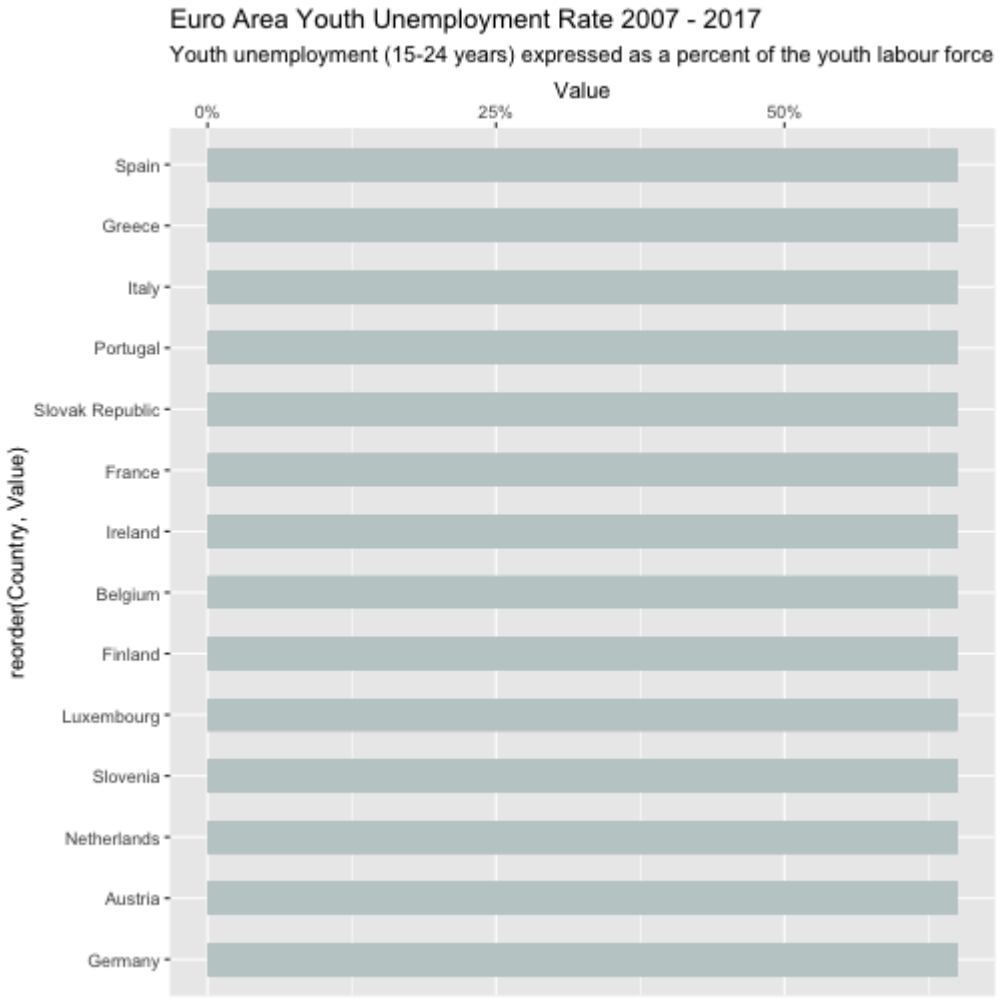
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")+
  scale_x_continuous(position = "top",
                     breaks = c(0, 25, 50),
                     labels=
                       function(x) paste0(x,"%"))+
  labs(title = "Euro Area Youth Unemployment Rate
```



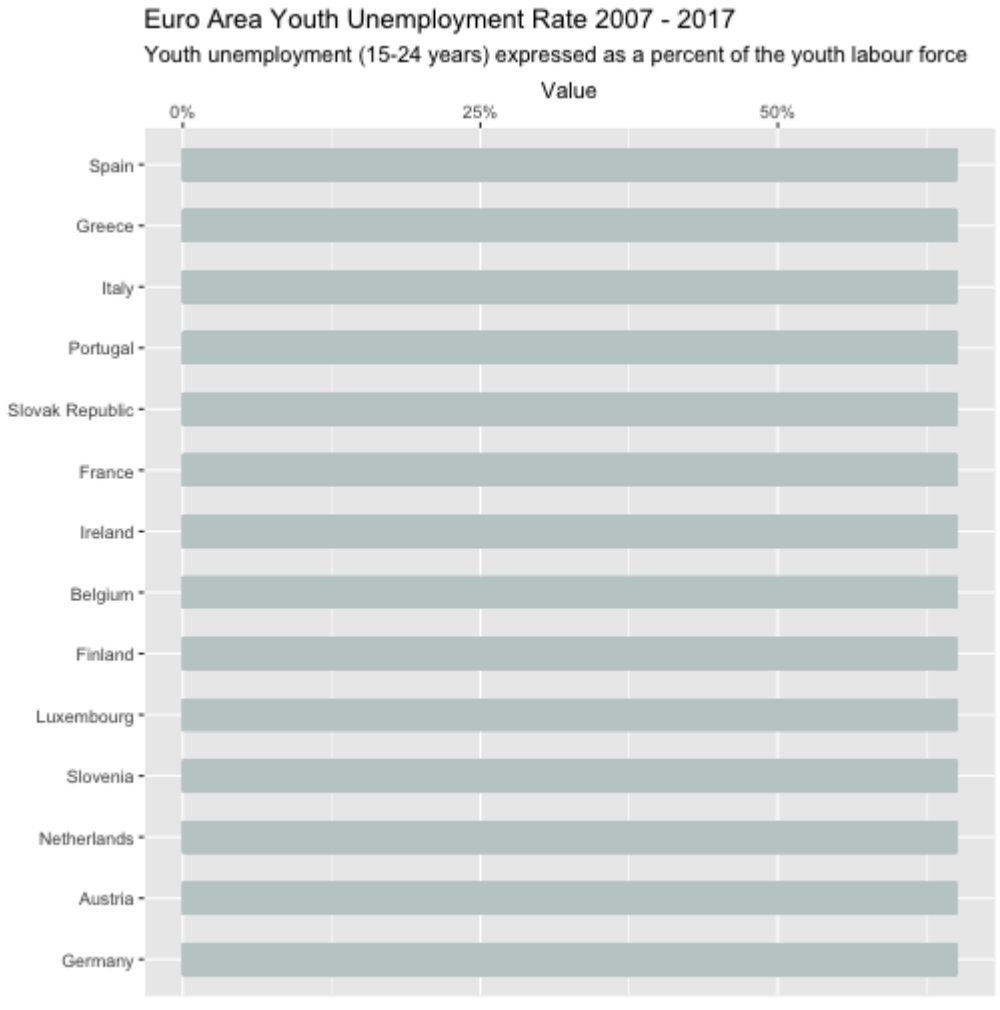
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")+
  scale_x_continuous(position = "top",
                     breaks = c(0, 25, 50),
                     labels=
                       function(x) paste0(x,"%"))+
  labs(title = "Euro Area Youth Unemployment Rate 2
  labs(subtitle = "Youth unemployment (15-24 years)
```



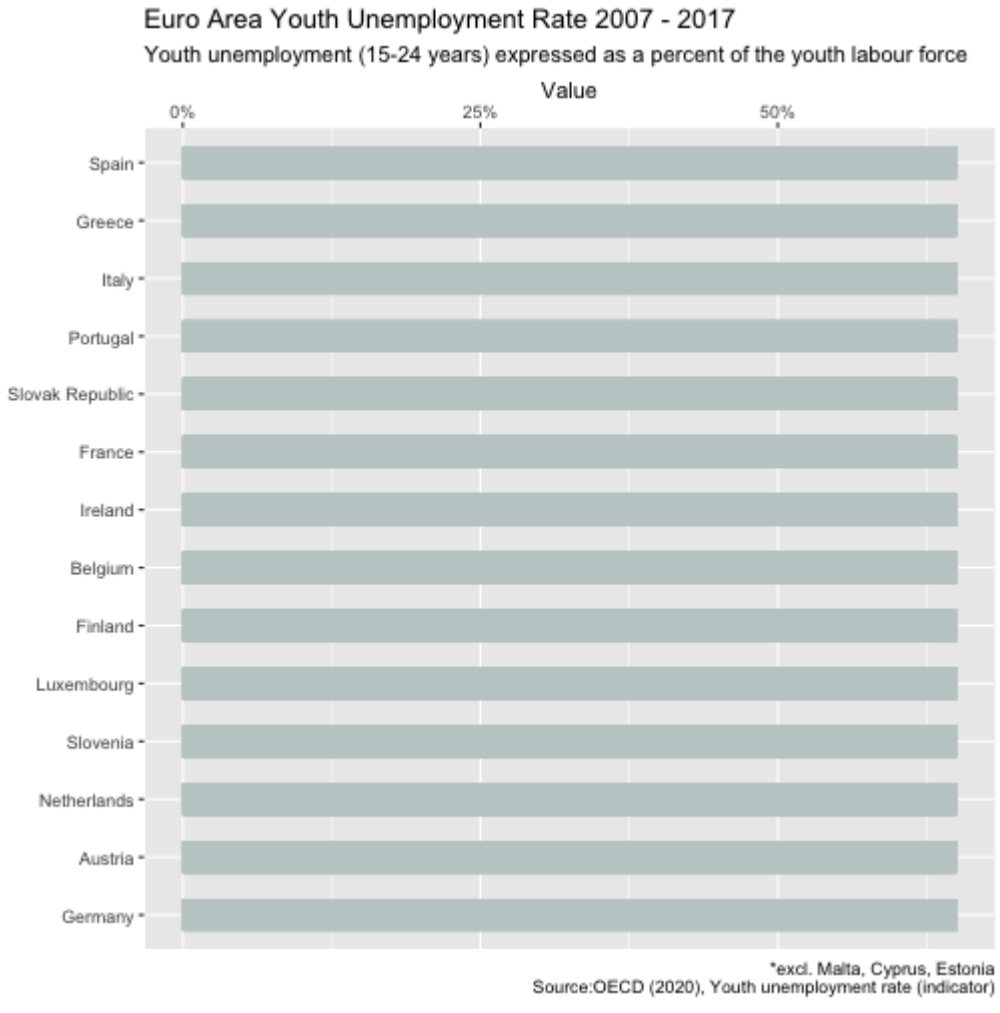
Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")+
  scale_x_continuous(position = "top",
                     breaks = c(0, 25, 50),
                     labels=
                       function(x) paste0(x,"%"))+
  labs(title = "Euro Area Youth Unemployment Rate 2
  labs(subtitle = "Youth unemployment (15-24 years)
  labs(y = NULL)
```



Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")+
  scale_x_continuous(position = "top",
                     breaks = c(0, 25, 50),
                     labels=
                       function(x) paste0(x,"%"))+
  labs(title = "Euro Area Youth Unemployment Rate 2
  labs(subtitle = "Youth unemployment (15-24 years)
  labs(y = NULL)+
  labs(caption = "*excl. Malta, Cyprus, Estonia\nS
```



Building the Plot

```
ggplot(data = plotdata) +
  aes(y = reorder(Country, Value))+
  aes(x = Value)+
  geom_segment(aes(x = 0, xend = 65,
                   yend = Country),
               size = 7.5,
               color = "azure3")+
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                     labels=
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  labs(y = NULL)+
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  plot
```

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ggplot(data = plotdata) +
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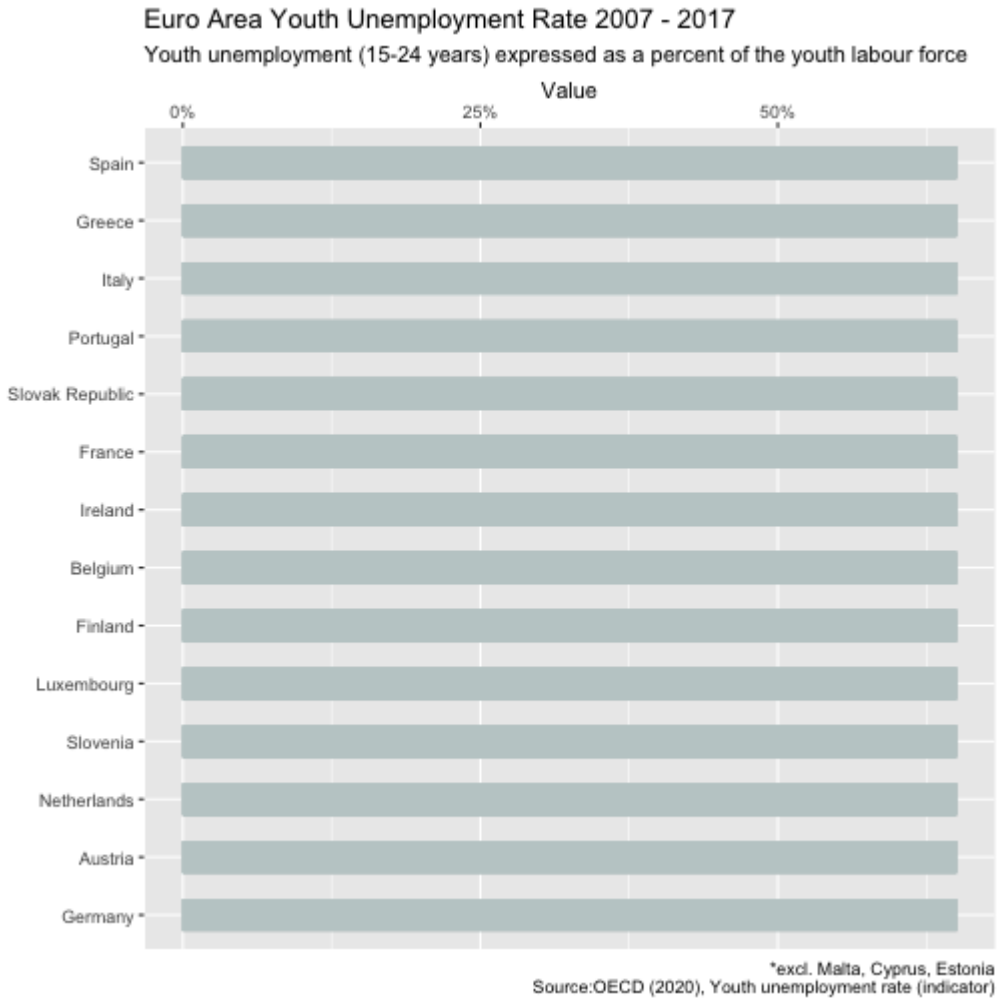
```

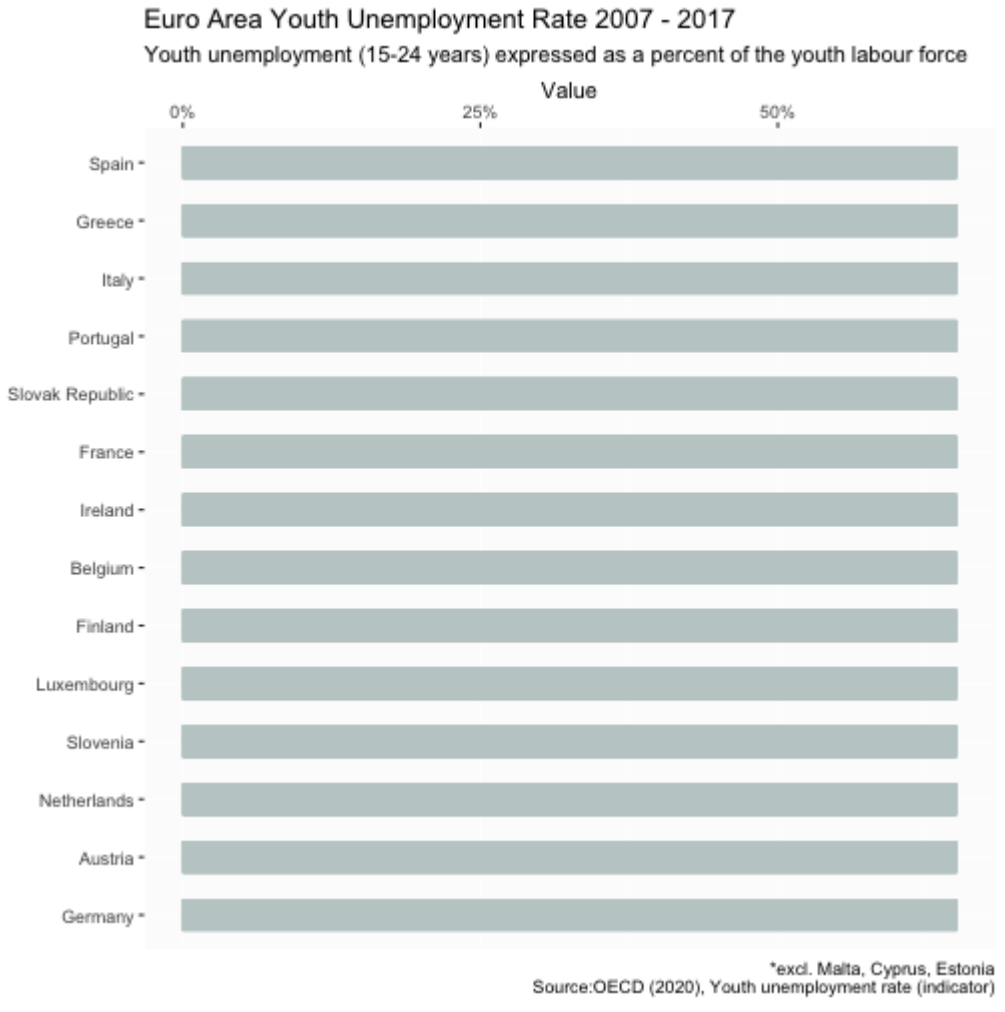
Building the Theme

```
plot
```



Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))
```



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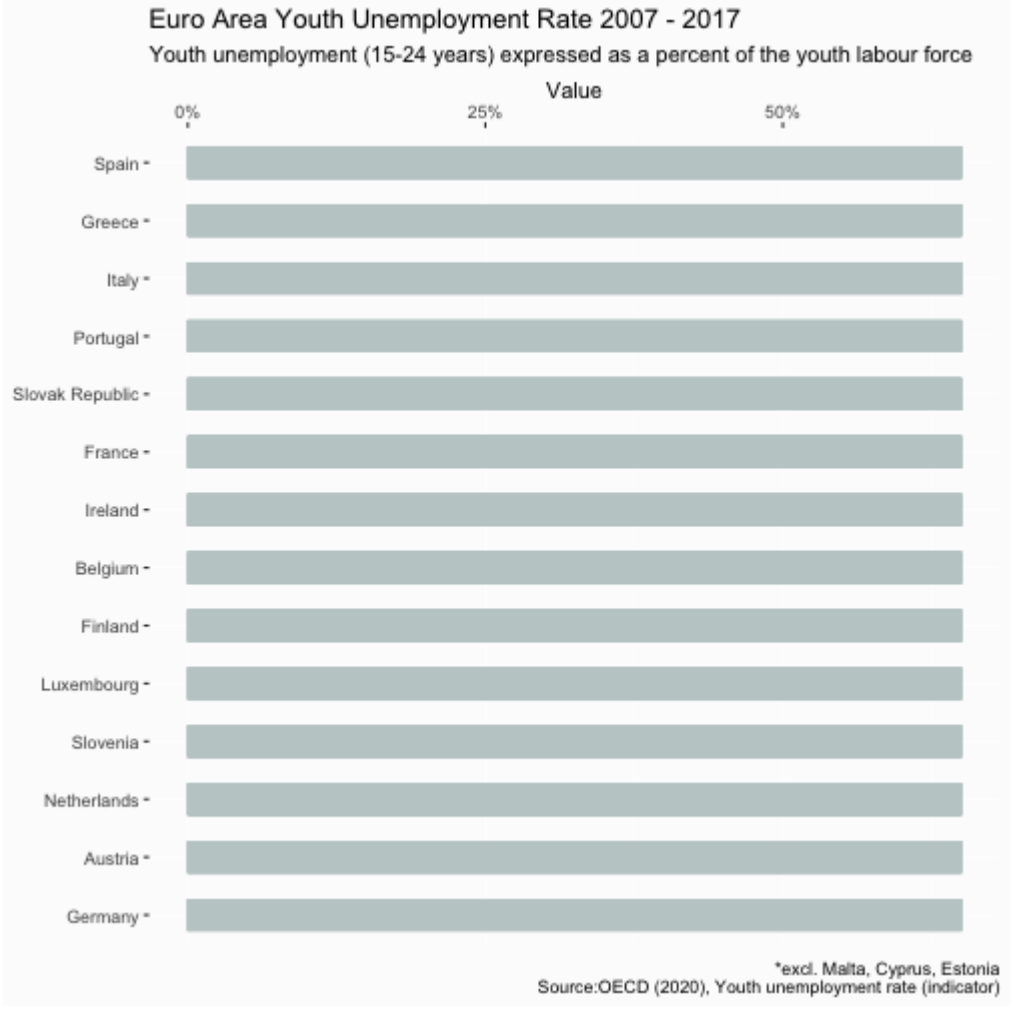
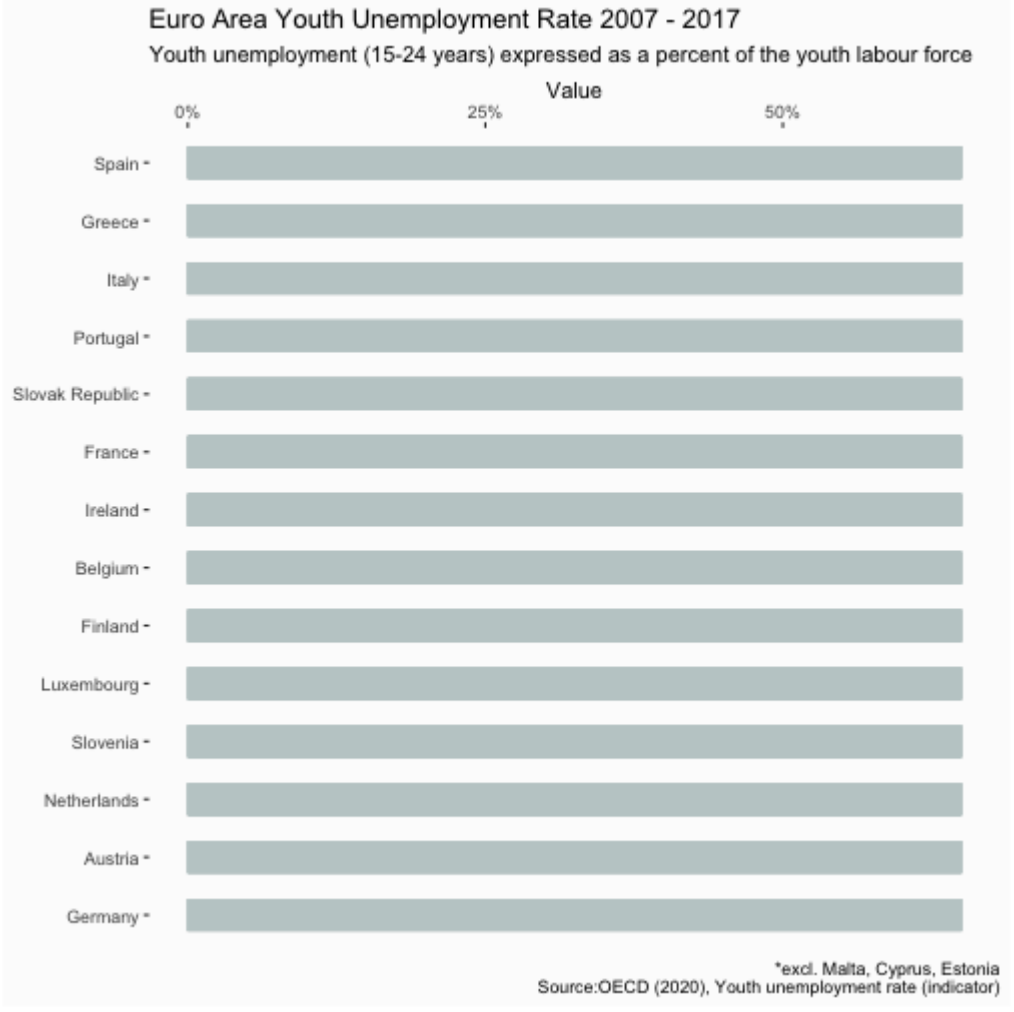
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))
```



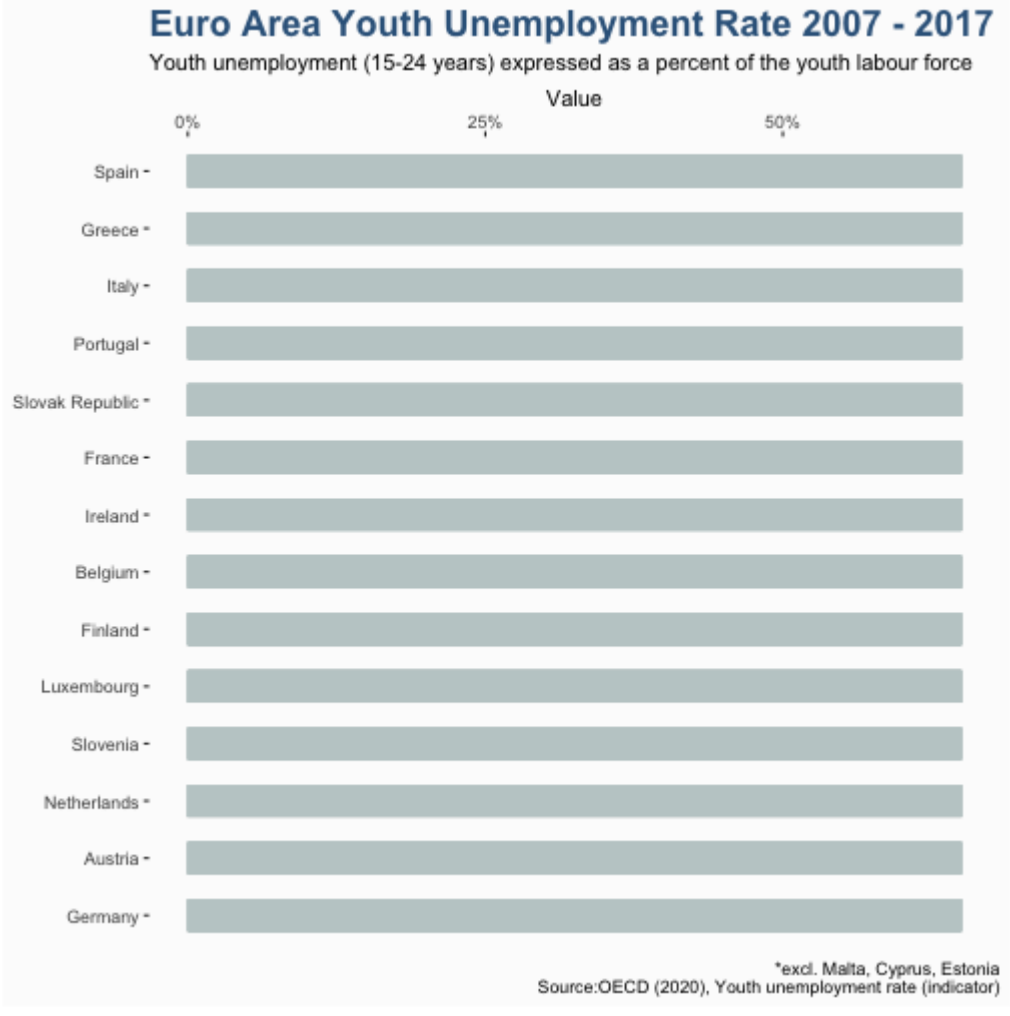
Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())
```



Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))
```



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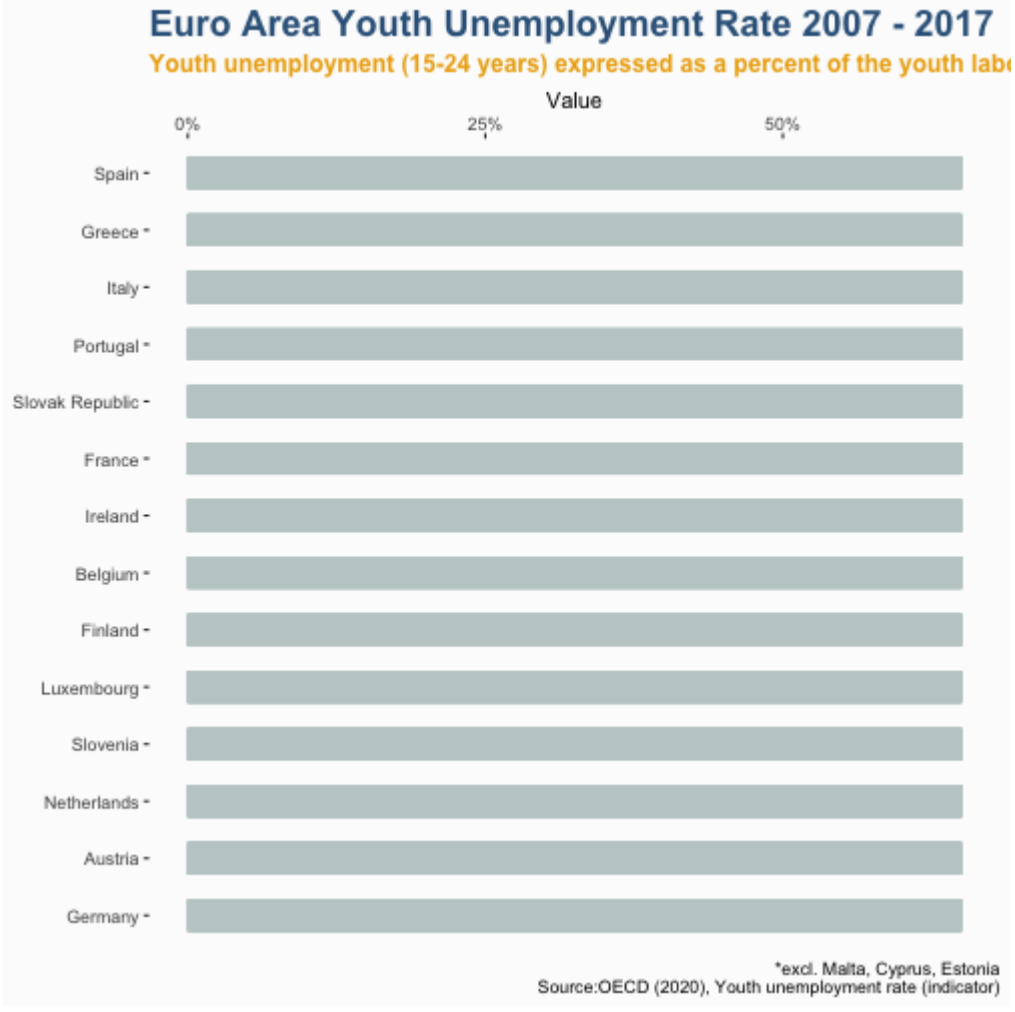
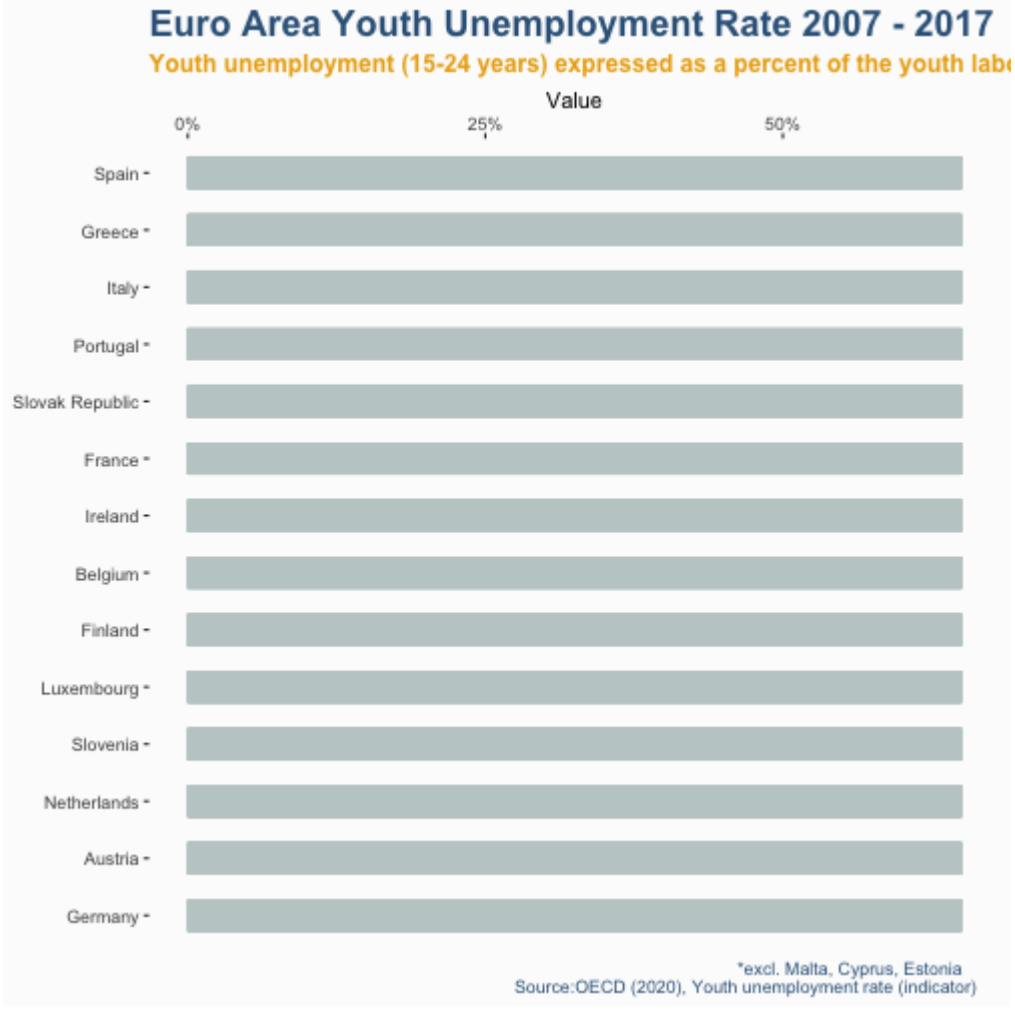
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(plot.subtitle =
      element_text(size = 12,
                   color = "darkgoldenrod2",
                   hjust = 0, face = "bold"))
```



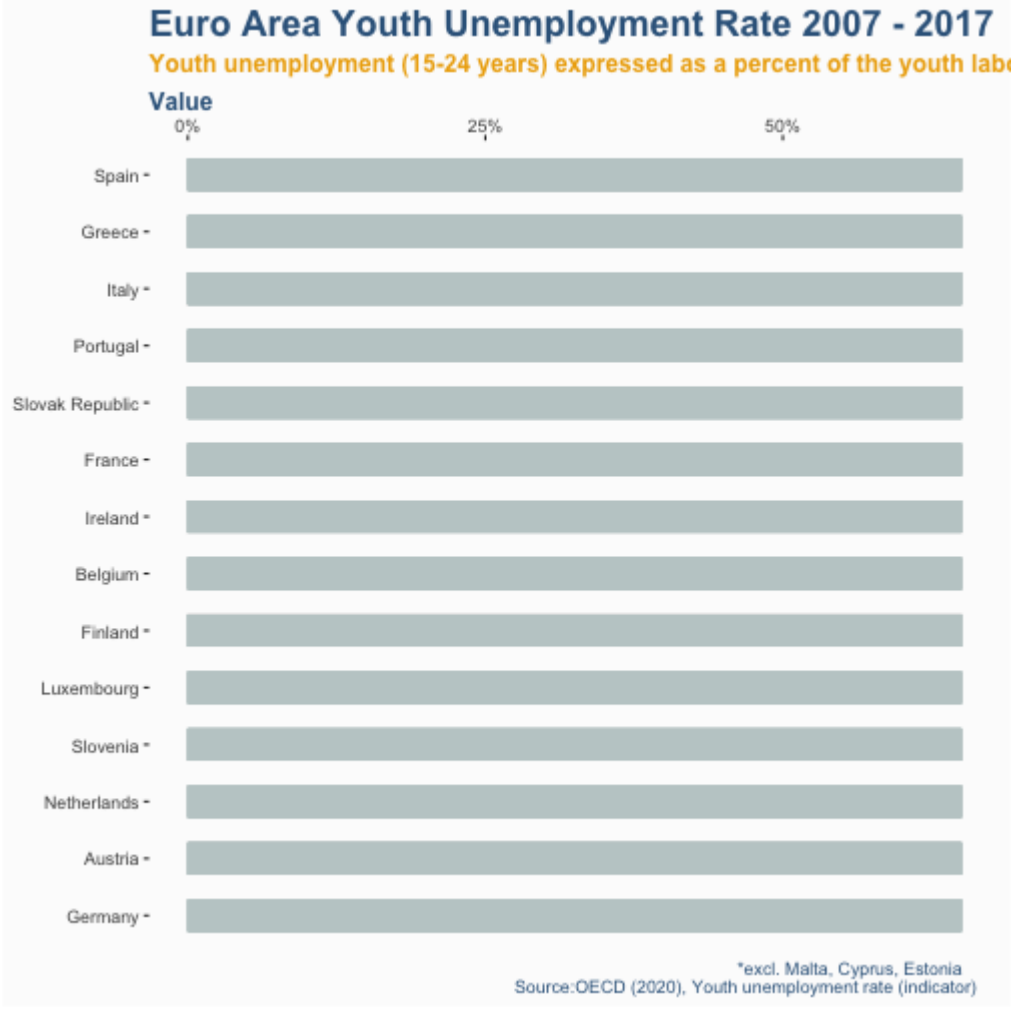
Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(plot.subtitle =
      element_text(size = 12,
                   color = "darkgoldenrod2",
                   hjust = 0, face = "bold"))+
  theme(plot.caption =
      element_text(color = "steelblue4",
                   hjust = 0.94))
```



Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(plot.subtitle =
      element_text(size = 12,
                   color = "darkgoldenrod2",
                   hjust = 0, face = "bold"))+
  theme(plot.caption =
      element_text(color = "steelblue4",
                   hjust = 0.94))+
  theme(axis.title.x =
      element_text(size = 12, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))
```



Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(plot.subtitle =
      element_text(size = 12,
                   color = "darkgoldenrod2",
                   hjust = 0, face = "bold"))+
  theme(plot.caption =
      element_text(color = "steelblue4",
                   hjust = 0.94))+
  theme(axis.title.x =
      element_text(size = 12, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(axis.text.x =
      element_text(size = 10,
                   color = "steelblue4",
                   hjust = 0.5))
```

Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(plot.subtitle =
      element_text(size = 12,
                   color = "darkgoldenrod2",
                   hjust = 0, face = "bold"))+
  theme(plot.caption =
      element_text(color = "steelblue4",
                   hjust = 0.94))+
  theme(axis.title.x =
      element_text(size = 12, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(axis.text.x =
      element_text(size = 10,
                   color = "steelblue4",
                   hjust = 0.5))+
  theme(
    axis.line.y = element_blank(),
    axis.text.y = element_blank(),
    axis.ticks.y= element_blank(),
    axis.ticks.x = element_blank(),
    axis.line.x = element_blank())
```

Building the Theme

```
plot+
  theme(panel.background =
      element_rect(fill = "grey99"))+
  theme(plot.background =
      element_rect(fill = "grey99"))+
  theme(panel.grid = element_blank())+
  theme(plot.title =
      element_text(size = 18, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(plot.subtitle =
      element_text(size = 12,
                   color = "darkgoldenrod2",
                   hjust = 0, face = "bold"))+
  theme(plot.caption =
      element_text(color = "steelblue4",
                   hjust = 0.94))+
  theme(axis.title.x =
      element_text(size = 12, hjust = 0,
                   color = "steelblue4",
                   face = "bold"))+
  theme(axis.text.x =
      element_text(size = 10,
                   color = "steelblue4",
                   hjust = 0.5))+
  theme(
    axis.line.y = element_blank(),
    axis.text.y = element_blank(),
    axis.ticks.y= element_blank(),
    axis.ticks.x = element_blank(),
    axis.line.x = element_blank())->
  plot2
```

Faceting

This intermediate step is not necessary, but in order to demostrate clearly how the plot will be built, we will facet by year using facet_wrap() to create an individual plot for each year. This will allow us to see how the bar lengths vary and add annotations before adding animations

Faceting

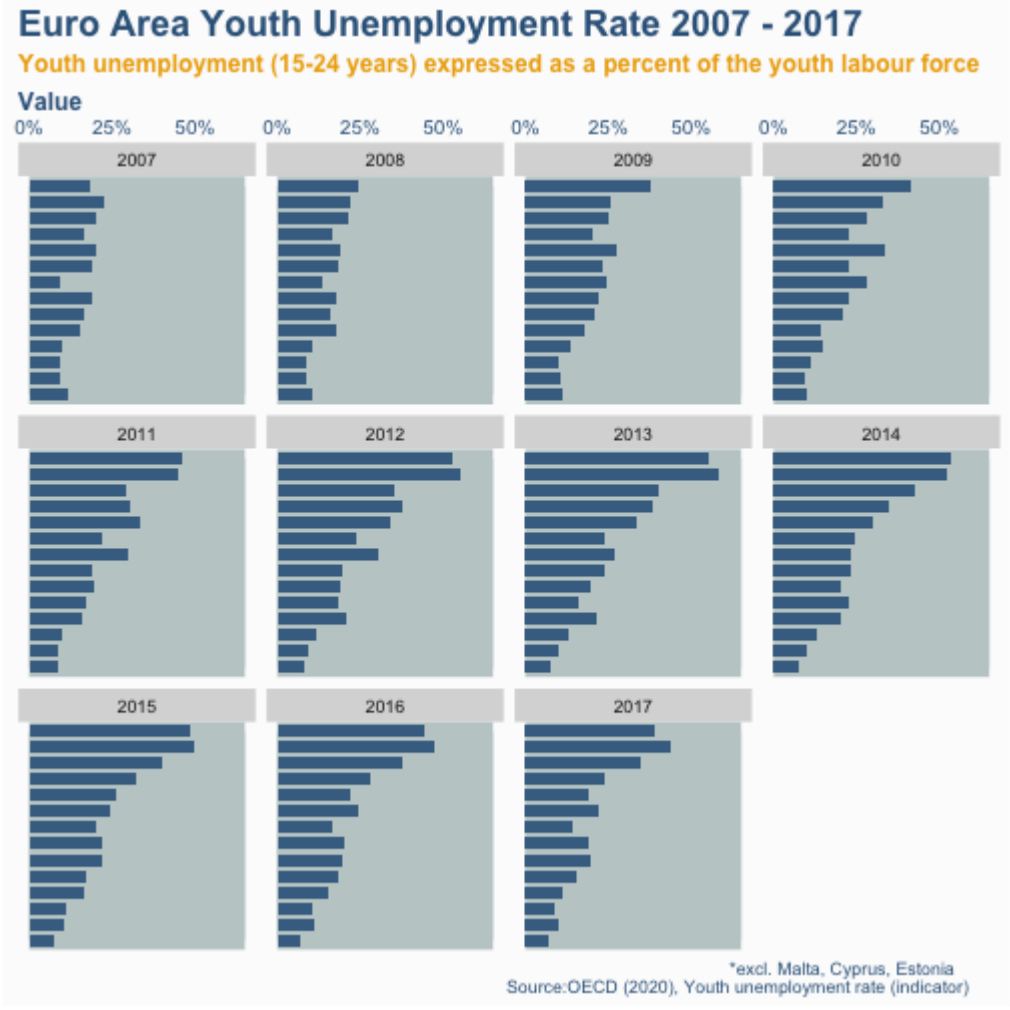
```
plot2
```

Faceting

```
plot2+
  facet_wrap(~ TIME, nrow=3)
```

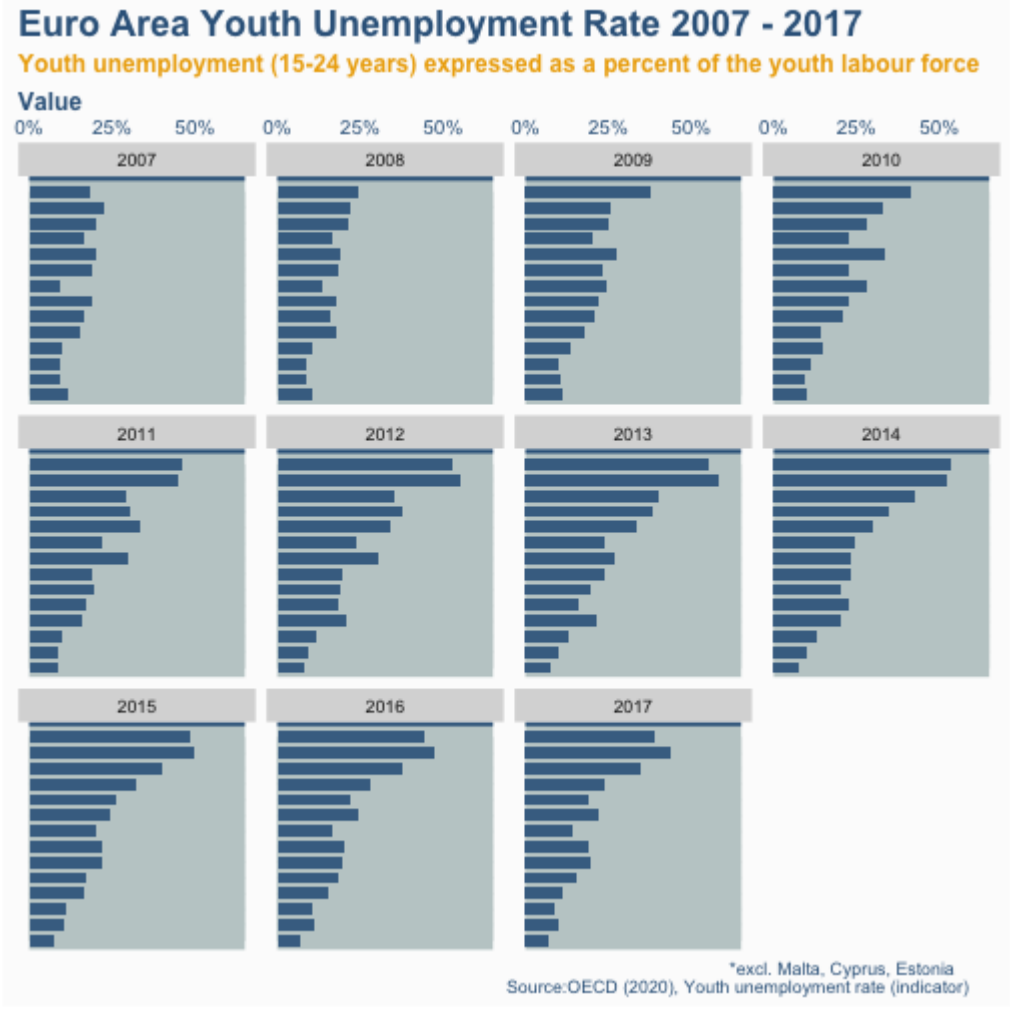
Faceting

```
plot2+
  facet_wrap(~ TIME, nrow=3)+
  geom_col(fill = "steelblue4",
           width = 0.75,
           alpha = 0.9)
```



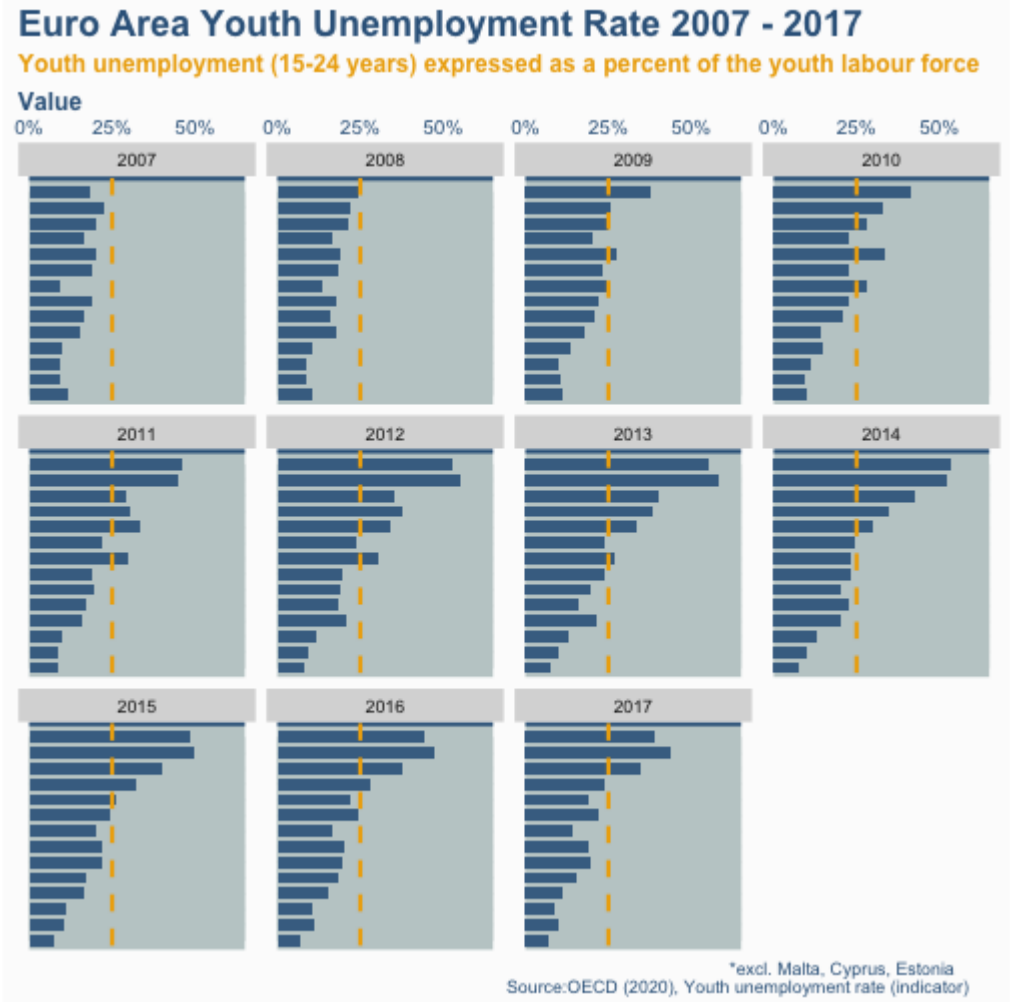
Faceting

```
plot2+
  facet_wrap(~ TIME, nrow=3)+
  geom_col(fill = "steelblue4",
           width = 0.75,
           alpha = 0.9)+
  annotate(x=0, xend=65,
           y=15, yend=15,
           colour="steelblue4",
           geom="segment",
           size = 2)
```



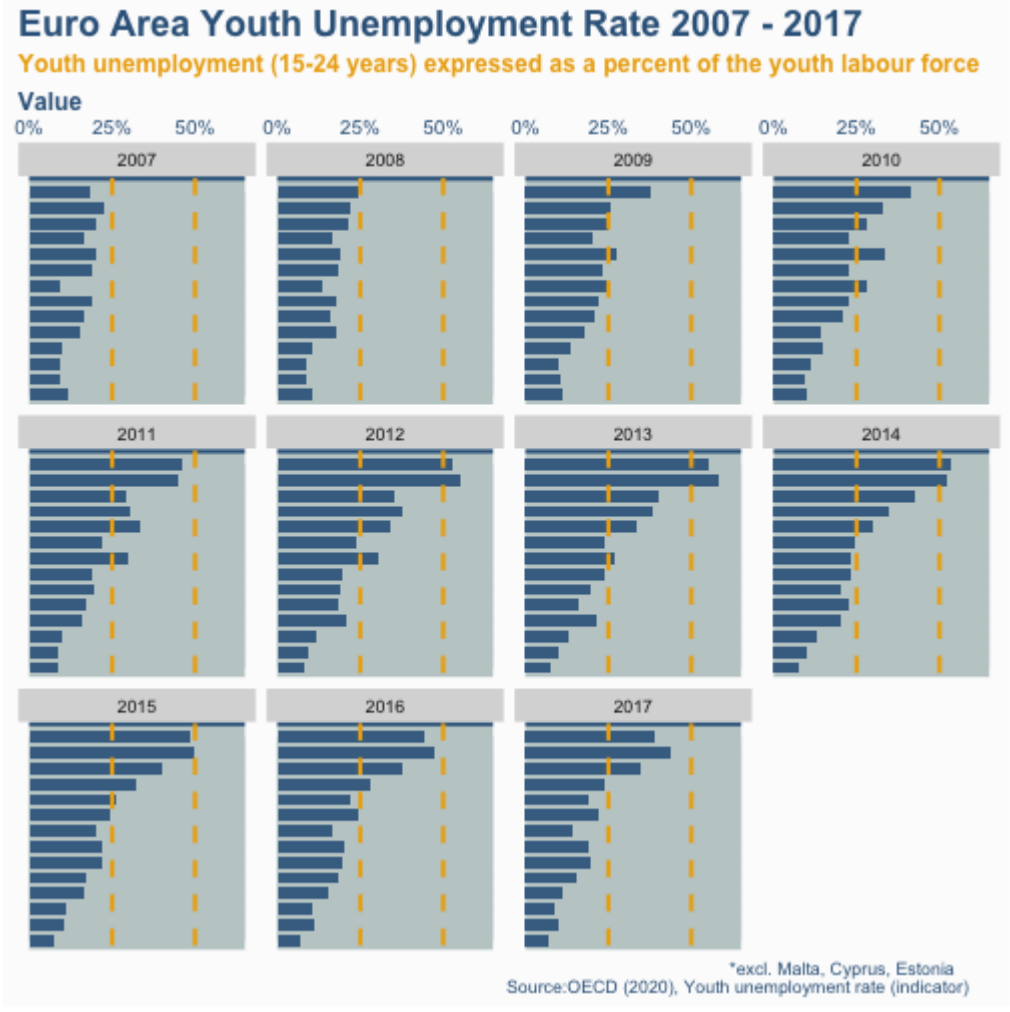
Faceting

```
plot2+
  facet_wrap(~ TIME, nrow=3)+
  geom_col(fill = "steelblue4",
           width = 0.75,
           alpha = 0.9)+
  annotate(x=0, xend=65,
           y=15, yend=15,
           colour="steelblue4",
           geom="segment",
           size = 2)+
  annotate(x = 25, xend = 25,
           y = 14.9, yend = 0.5,
           size = 1, geom="segment",
           color = "darkgoldenrod2",
           linetype = "dashed")
```



Faceting

```
plot2+
  facet_wrap(~ TIME, nrow=3)+
  geom_col(fill = "steelblue4",
           width = 0.75,
           alpha = 0.9)+
  annotate(x=0, xend=65,
           y=15, yend=15,
           colour="steelblue4",
           geom="segment",
           size = 2)+
  annotate(x = 25, xend = 25,
           y = 14.9, yend = 0.5,
           size = 1, geom="segment",
           color = "darkgoldenrod2",
           linetype = "dashed")+
  annotate(x = 50, xend = 50,
           y = 14.9, yend = 0.5,
           size = 1, geom="segment",
           color = "darkgoldenrod2",
           linetype = "dashed")
```

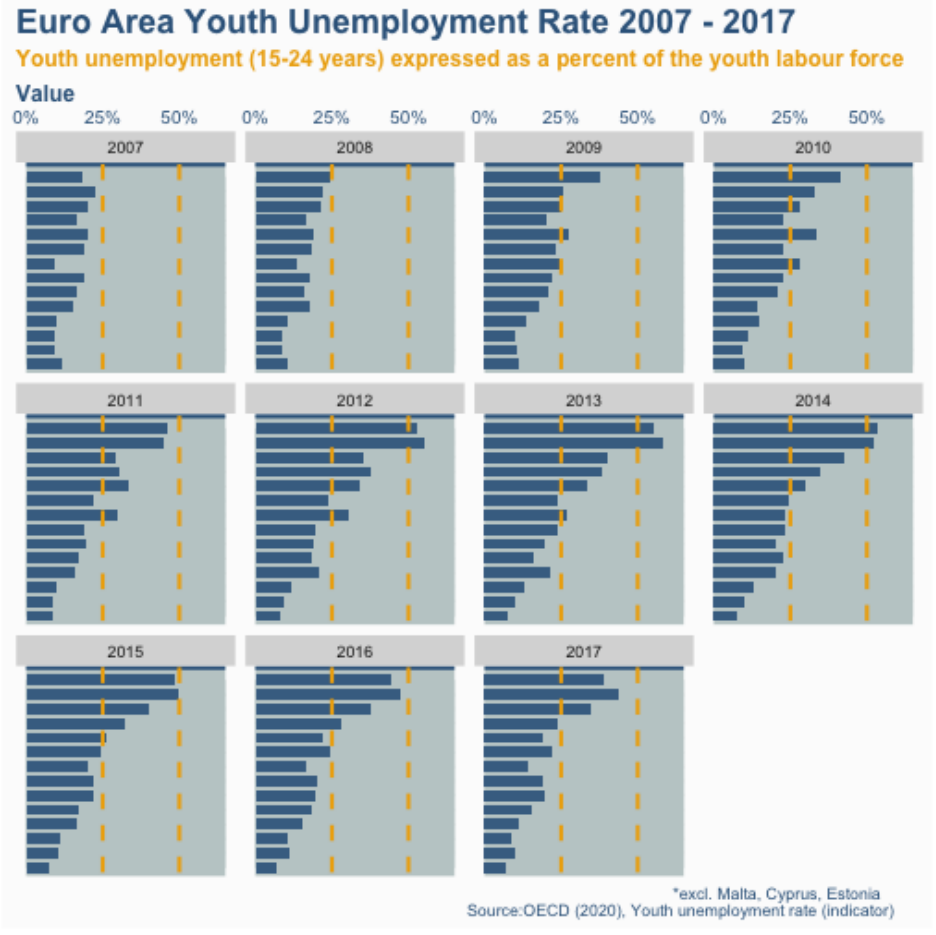


Faceting

```
plot2+
  facet_wrap(~ TIME, nrow=3)+
  geom_col(fill = "steelblue4",
           width = 0.75,
           alpha = 0.9)+
  annotate(x=0, xend=65,
           y=15, yend=15,
           colour="steelblue4",
           geom="segment",
           size = 2)+
  annotate(x = 25, xend = 25,
           y = 14.9, yend = 0.5,
           size = 1, geom="segment",
           color = "darkgoldenrod2",
           linetype = "dashed")+
  annotate(x = 50, xend = 50,
           y = 14.9, yend = 0.5,
           size = 1, geom="segment",
           color = "darkgoldenrod2",
           linetype = "dashed")->
  plot3
```

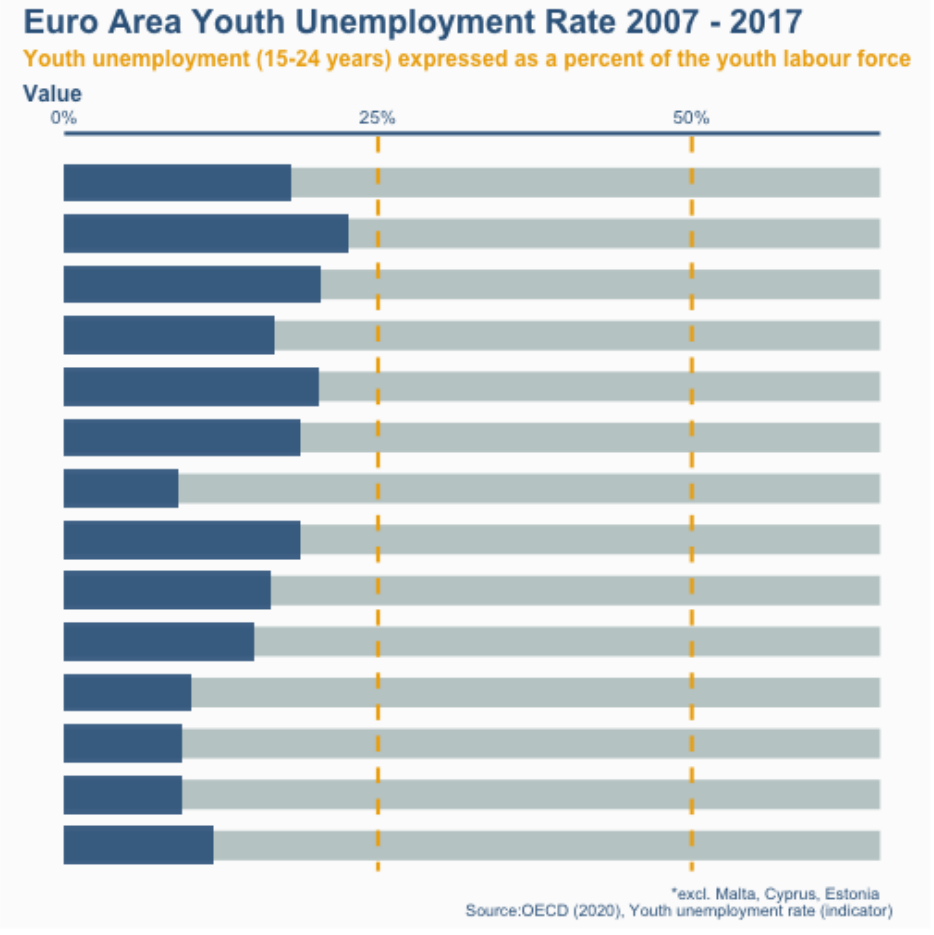
Adding the Animation

```
plot3
```



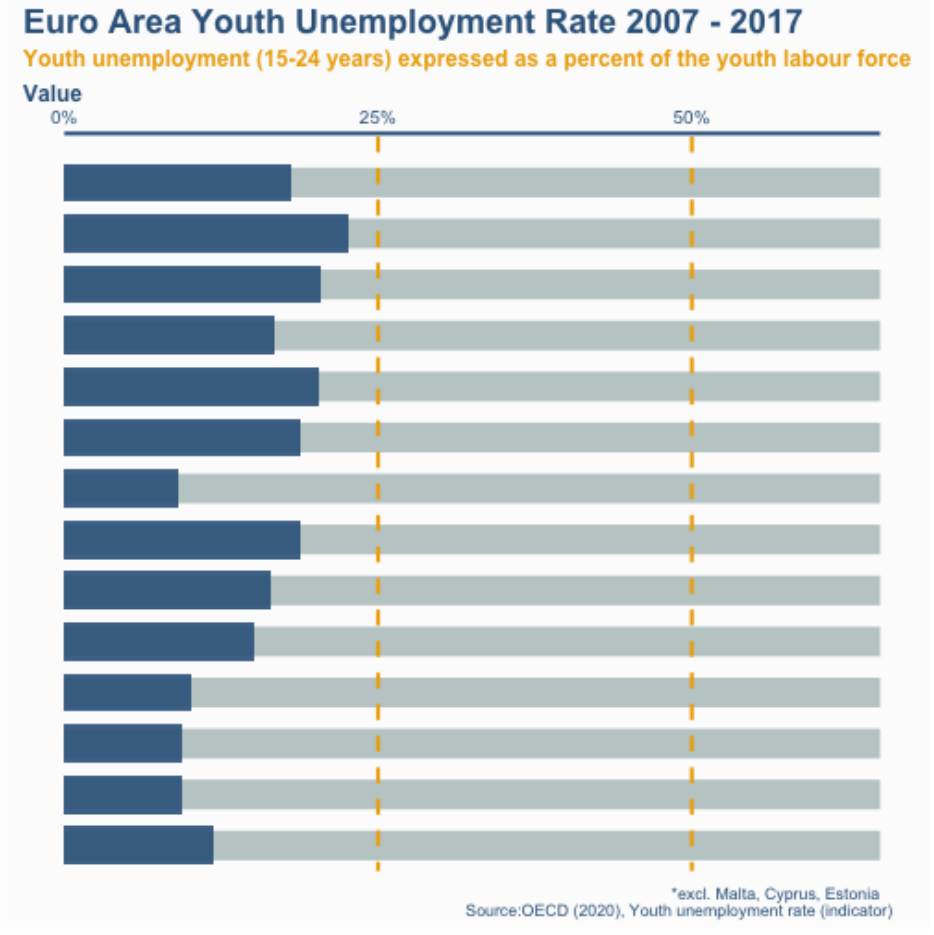
Adding the Animation

```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)
```



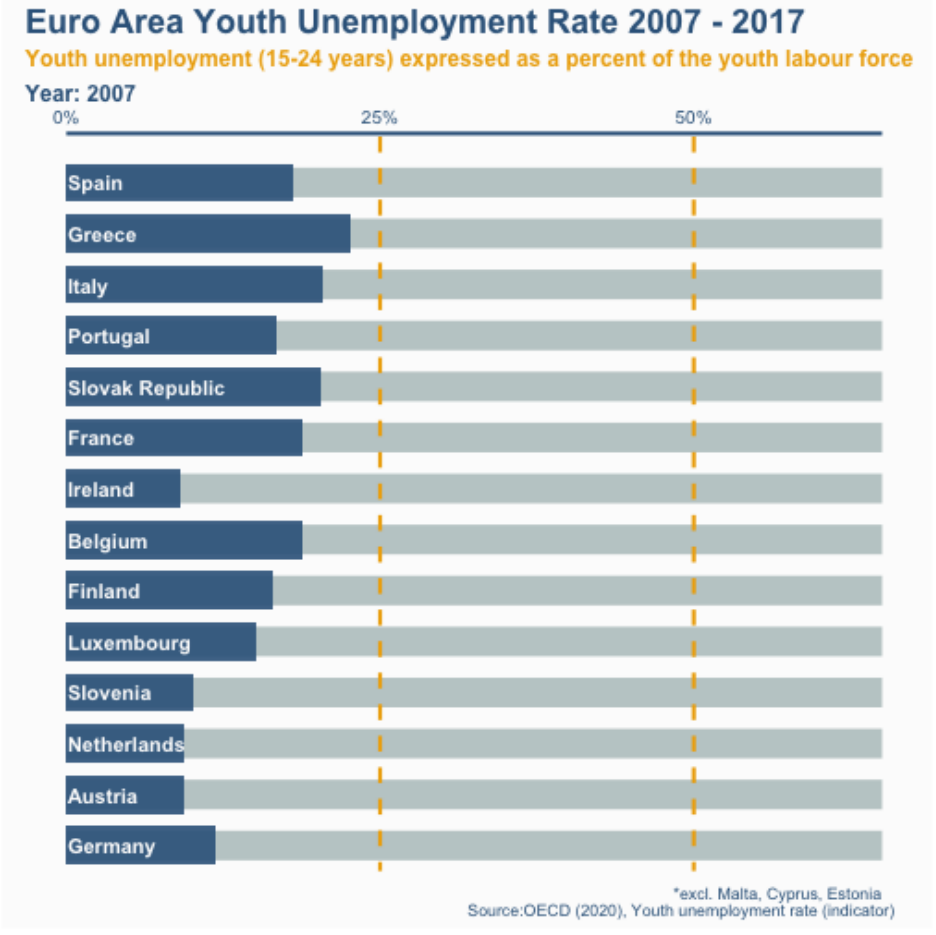
Adding the Animation

```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)+
  ease_aes('linear')
```



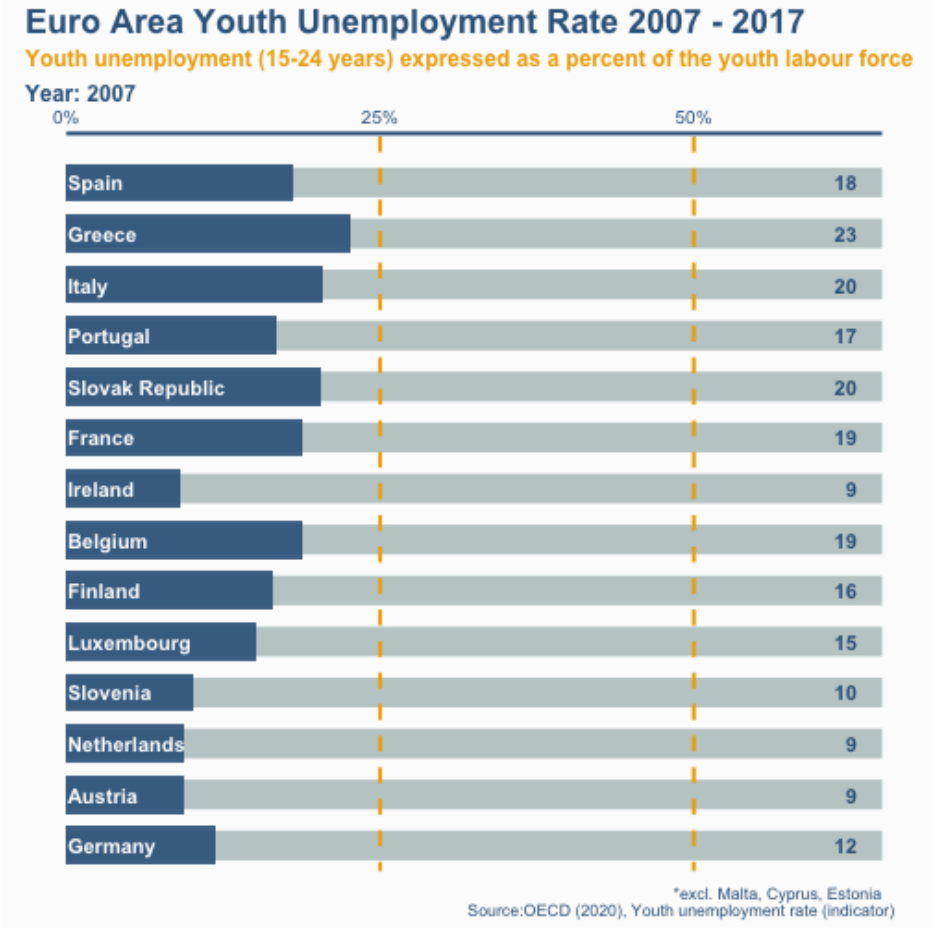
Adding the Animation

```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)+
  ease_aes('linear')+
  labs(x = 'Year: {format(round(frame_time, digits = 0))}')+
  geom_text(aes(label = reorder(Country, Value)),
            x = 0.1, hjust = 0, color = "grey99",
            fontface = "bold")
```



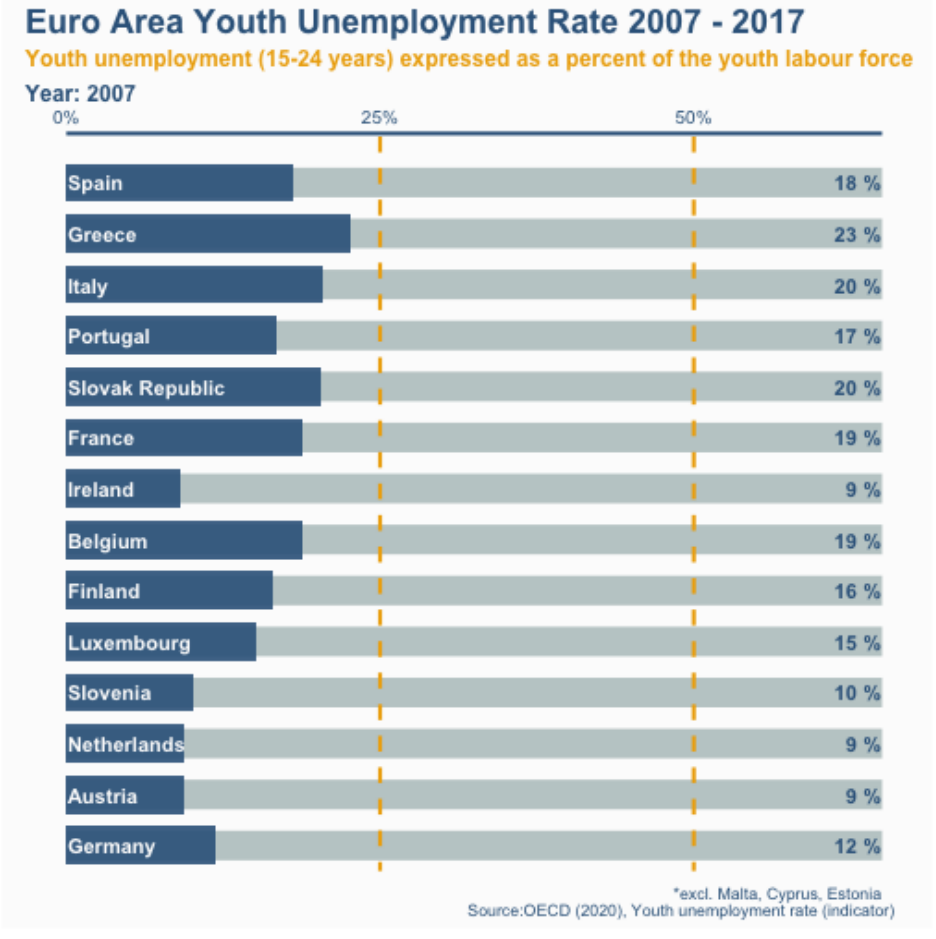
Adding the Animation

```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)+
  ease_aes('linear')+
  labs(x = 'Year: {format(round(frame_time, digits = 0))}')+
  geom_text(aes(label = reorder(Country, Value)),
            x = 0.1, hjust = 0, color = "grey99",
            fontface = "bold")+
  geom_text(aes(label =
                  format(round(Value, digits = 0))),
            x = 63, color = "steelblue4",
            fontface = "bold", hjust = 1)
```



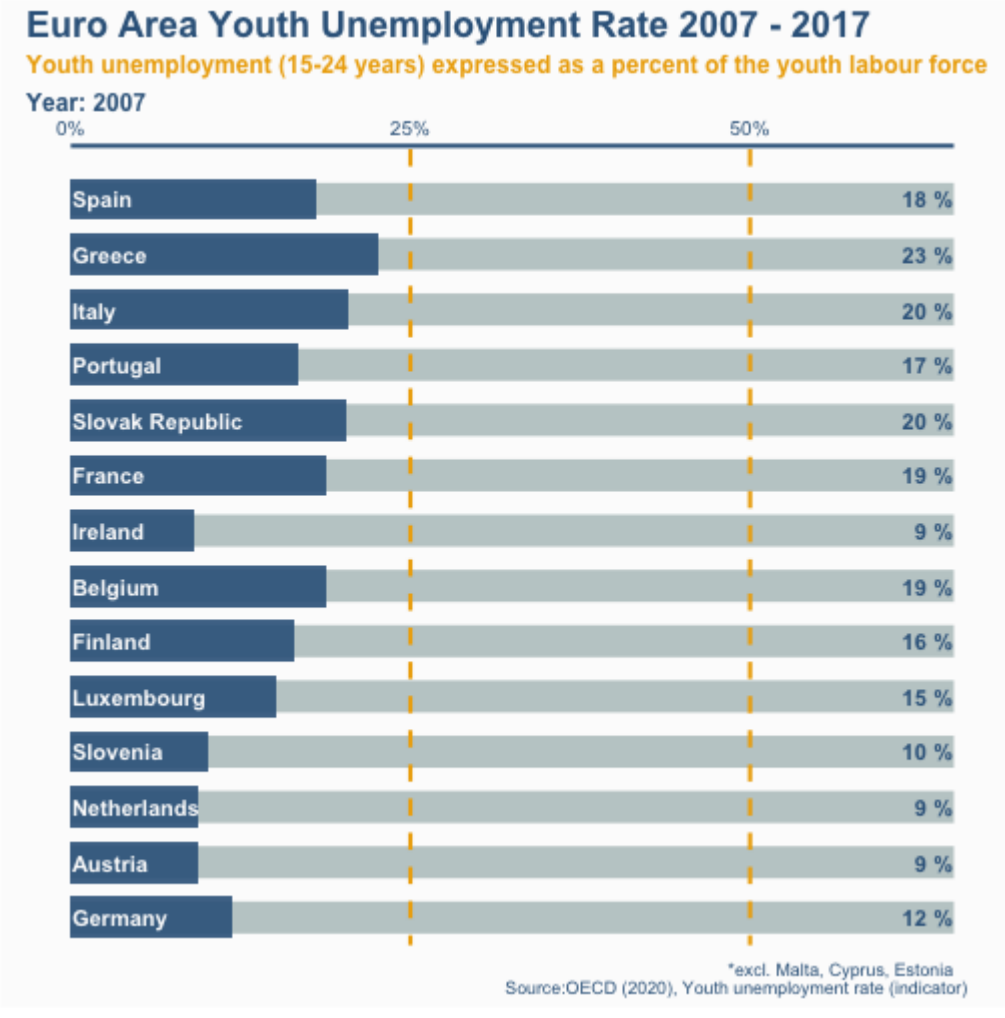
Adding the Animation

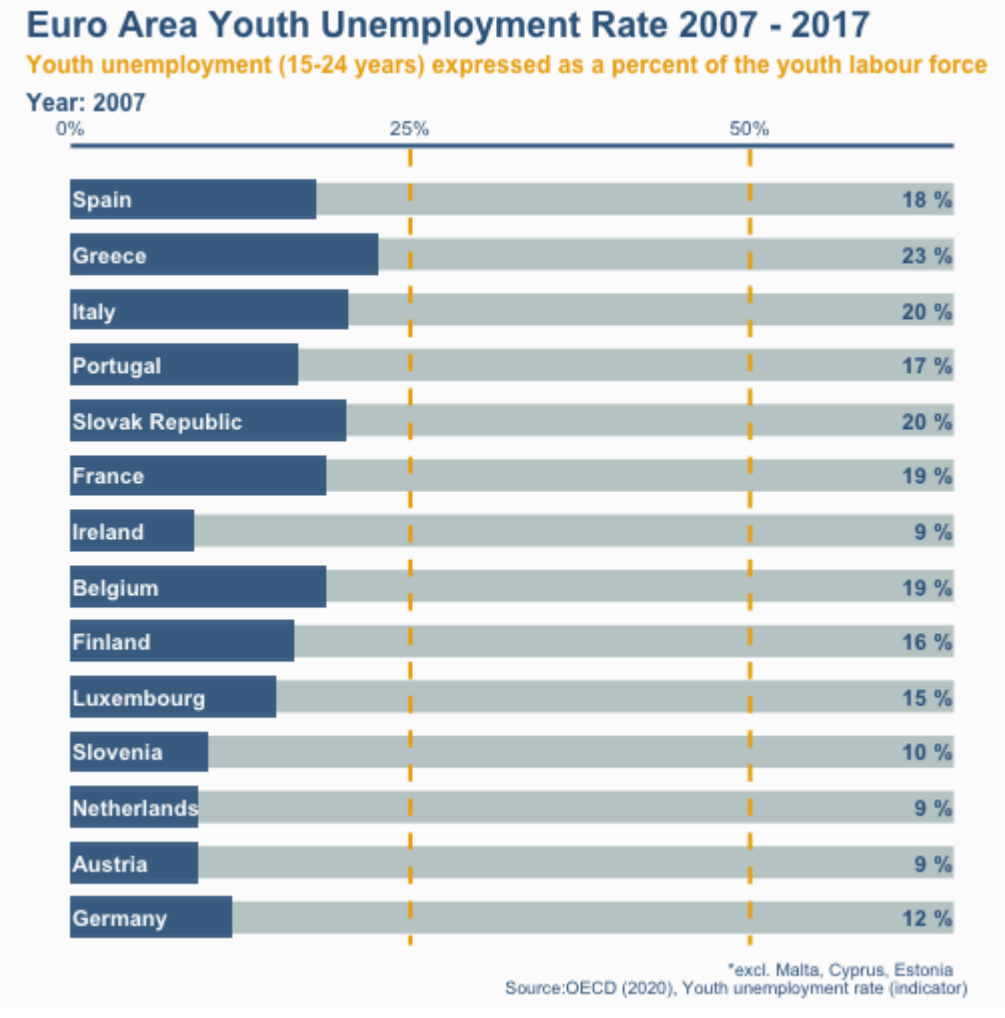
```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)+
  ease_aes('linear')+
  labs(x = 'Year: {format(round(frame_time, digits = 0))}')+
  geom_text(aes(label = reorder(Country, Value)),
            x = 0.1, hjust = 0, color = "grey99",
            fontface = "bold")+
  geom_text(aes(label =
                  format(round(Value, digits = 0))),
            x = 63, color = "steelblue4",
            fontface = "bold", hjust = 1)+
  geom_text(x=63.5, label = "%", color = "steelblue4",
            fontface = "bold", hjust = 0)
```



Adding the Animation

```
plot3+
  facet_null()+
  gganimate::transition_time(TIME)+
  ease_aes('linear')+
  labs(x = 'Year: {format(round(frame_time, digits = 0))}')+
  geom_text(aes(label = reorder(Country, Value)),
            x = 0.1, hjust = 0, color = "grey99",
            fontface = "bold")+
  geom_text(aes(label =
                  format(round(Value, digits = 0))),
            x = 63, color = "steelblue4",
            fontface = "bold", hjust = 1)+
  geom_text(x=63.5, label = "%", color = "steelblue4",
            fontface = "bold", hjust = 0)->
  finalplot
```


Euro Area Youth Unemployment Rate 2007 - 2017
Youth unemployment (15-24 years) expressed as a percent of the youth labour force
Year: 2007
0%
25%
50%
Spain
18 %
Greece
23 %
Italy
20 %
Portugal
17 %
Slovak Republic
20 %
France
19 %
Ireland
9 %
Belgium
19 %
Finland
16 %
Luxembourg
15 %
Slovenia
10 %
Netherlands
9 %
Austria
9 %
Germany
12 %
*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)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0%
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19 %
Finland
16 %
Luxembourg
15 %
Slovenia
10 %
Netherlands
9 %
Austria
9 %
Germany
12 %
*excl. Malta, Cyprus, Estonia
Source:OECD (2020), Youth unemployment rate (indicator)