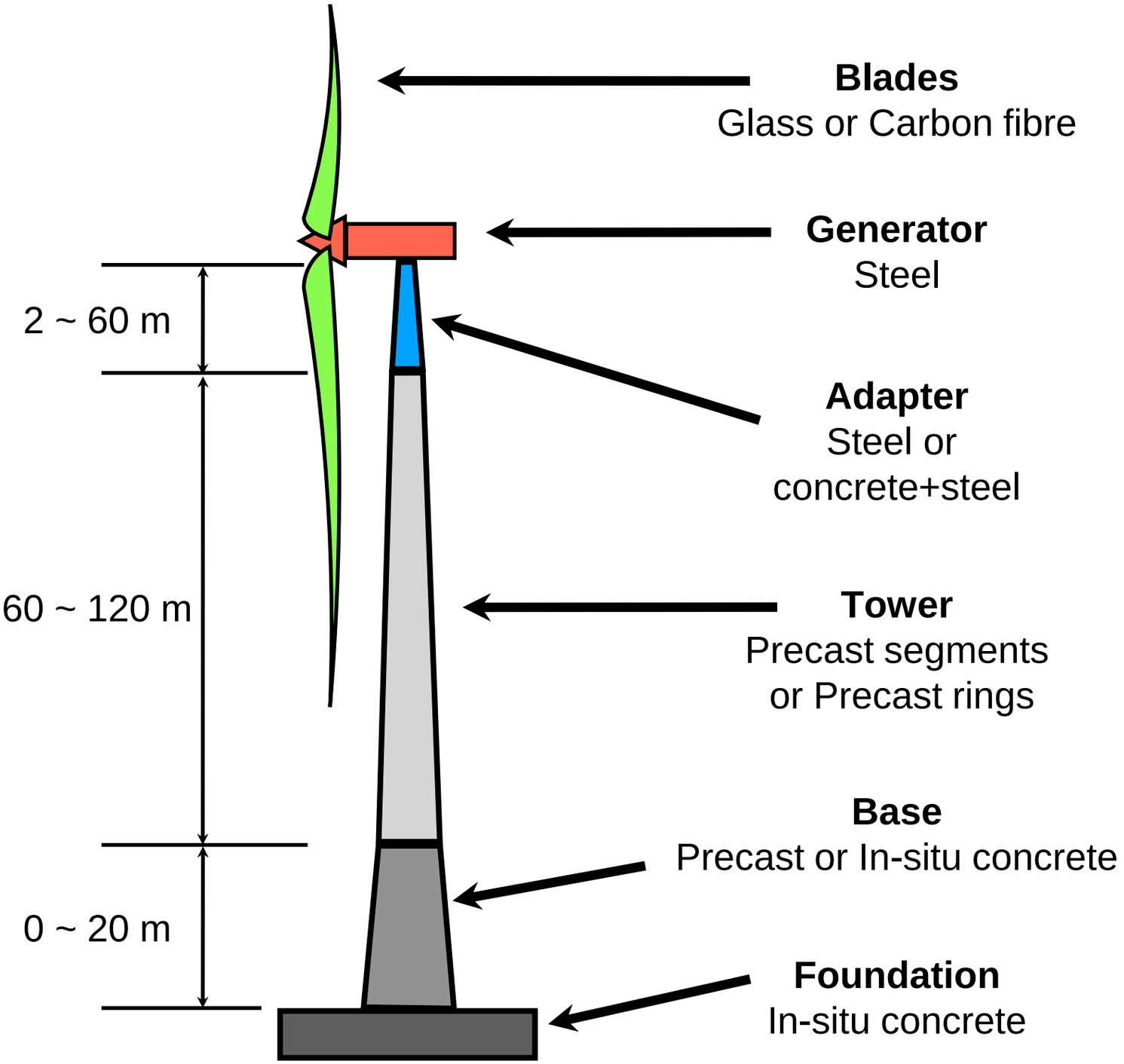
***fib*/CNI International Seminar on Precast Concrete in Seismic Regions and International Perspectives**

# fib Commission 6 Prefabrication

## TG 6.4 Wind Towers

# WTG Tower Structure




**Blades**
Glass or Carbon fibre

**Generator**
Steel

**Adapter**
Steel or
concrete+steel

**Tower**
Precast segments
or Precast rings

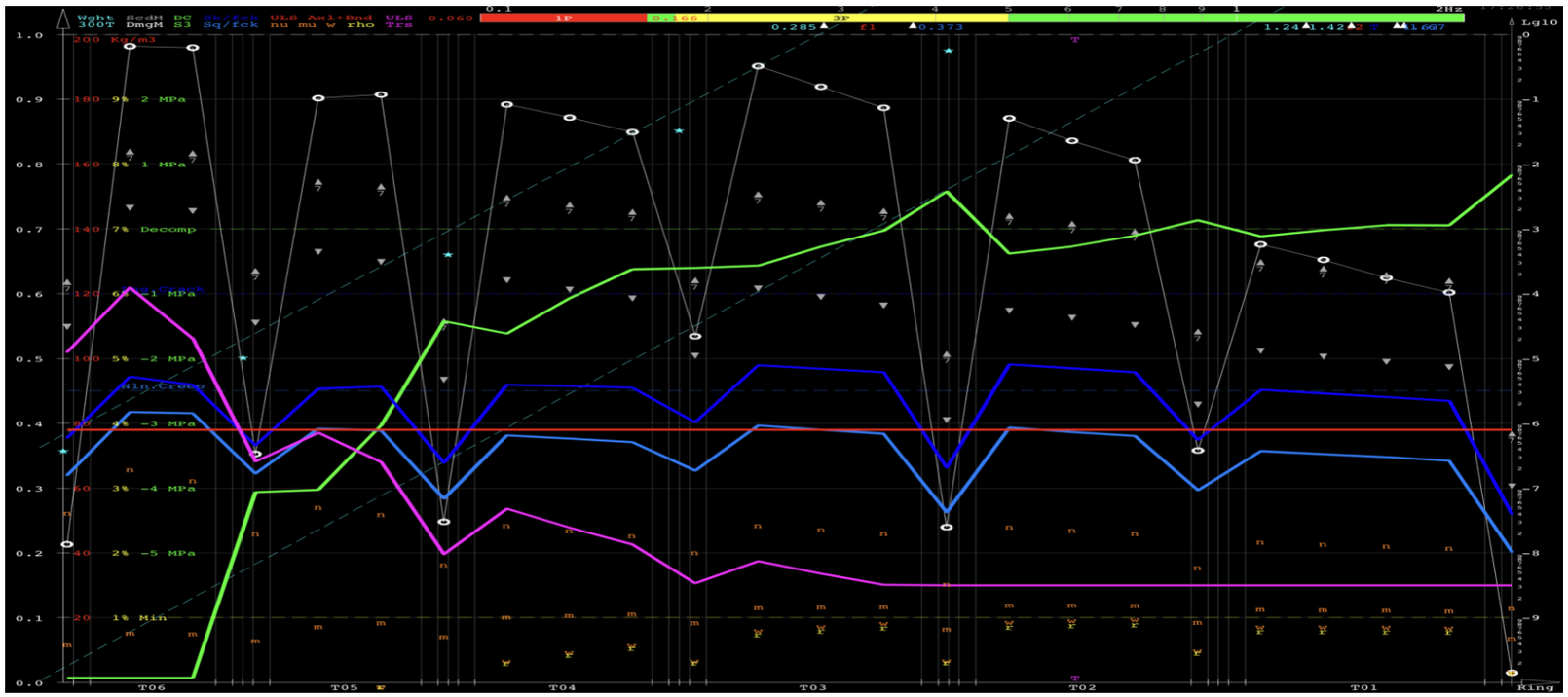
**Base**
Precast or In-situ concrete

**Foundation**
In-situ concrete

# Why so few WTG Precast Towers?

- The wind industry does not trust in concrete technology because:

  ✦ There is a lack of scientific knowledge and detailed code regulations in key aspects for the WTG towers as the fatigue strength and the dynamic response and a lack of concrete specialized engineers in the wind industry technical staff




*Typical Concrete Wind Tower Fatigue Analysis*

# Why so few WTG Precast Towers?

- The wind industry does not trust in concrete technology because:

  ✦ Concrete is more difficult to assembly. In situ works (assembly and wet joints) are perceived as riskier than steel bolting

*Concrete Wind Tower Assembly in Brasil (Calter)*

# Why so few WTG Precast Towers?

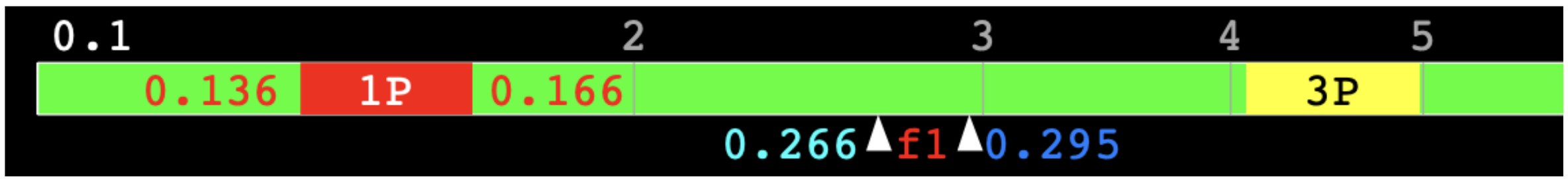
- The wind industry does not trust in concrete technology because:

  - ✦ Concrete is less homogeneous than steel. It's difficult to produce exactly the same component for the machine in completely different world locations (different aggregates, cements, concrete production practices, ambient conditions ...)

*Concrete Wind Tower Assembly in Finland (Calter)*

# Why so few WTG Precast Towers?

- The concrete precast industry does not know the very special requirements of concrete WTG towers
  - ✦ Concrete Tower is designed to be "a component" of a complex dynamic machine. Strong dynamic mechanical requirements apply

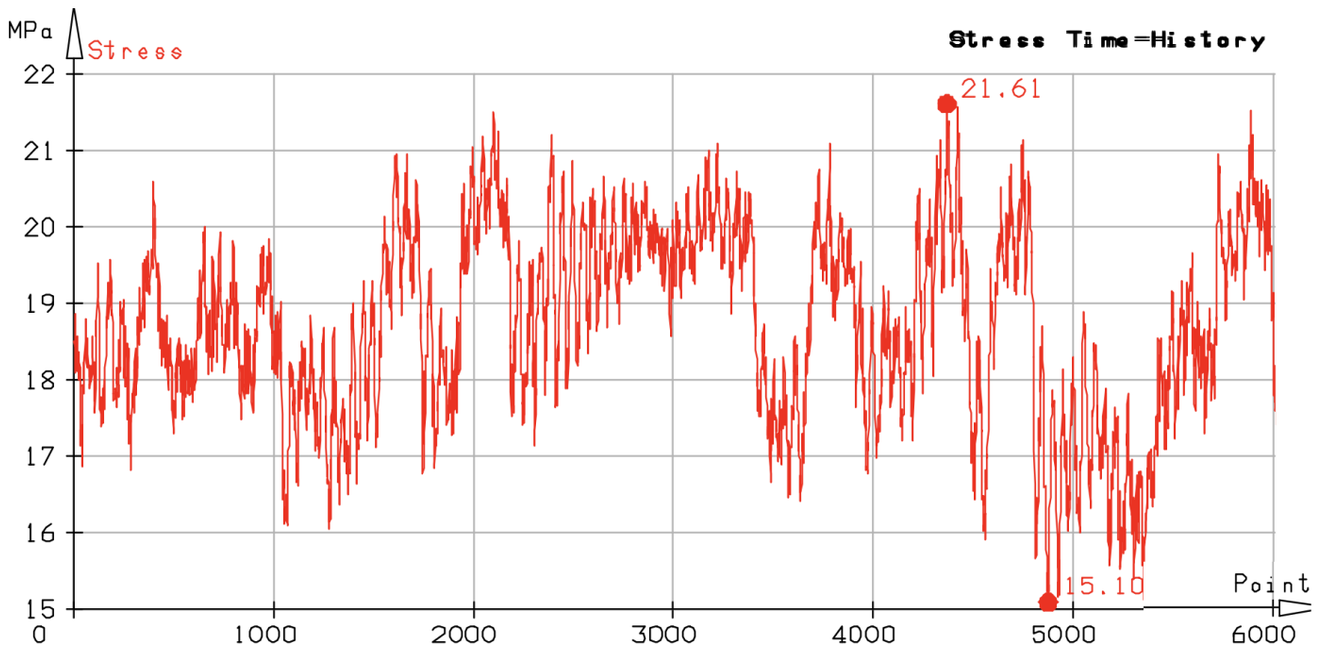



*WTG Concrete Tower Frequency assessment*

# Why so few WTG Precast Towers?

- The concrete precast industry does not know the very special requirements of concrete WTG towers

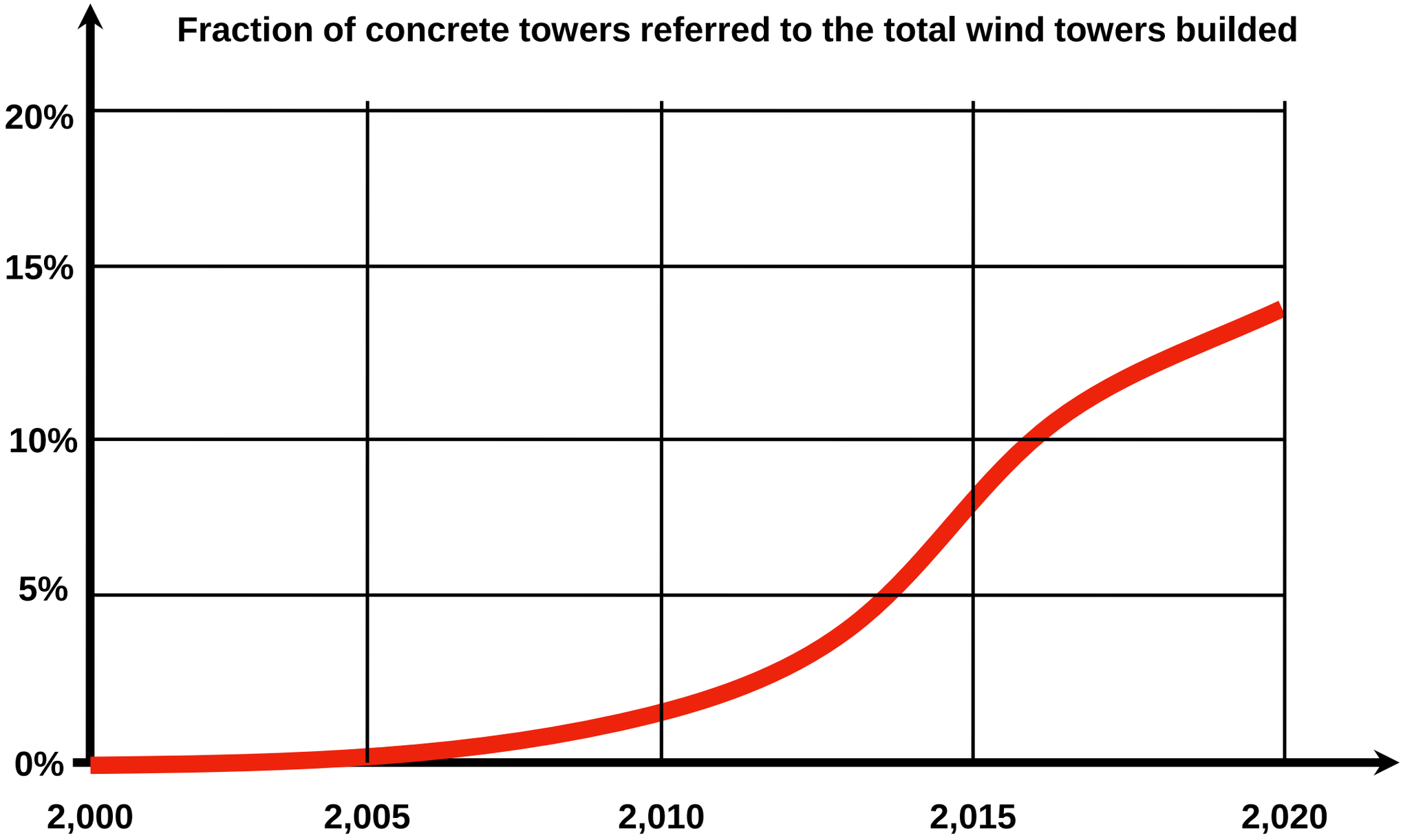
  ✦ The concrete tower design is mainly driven by the compression fatigue of concrete and joints+assembly cost



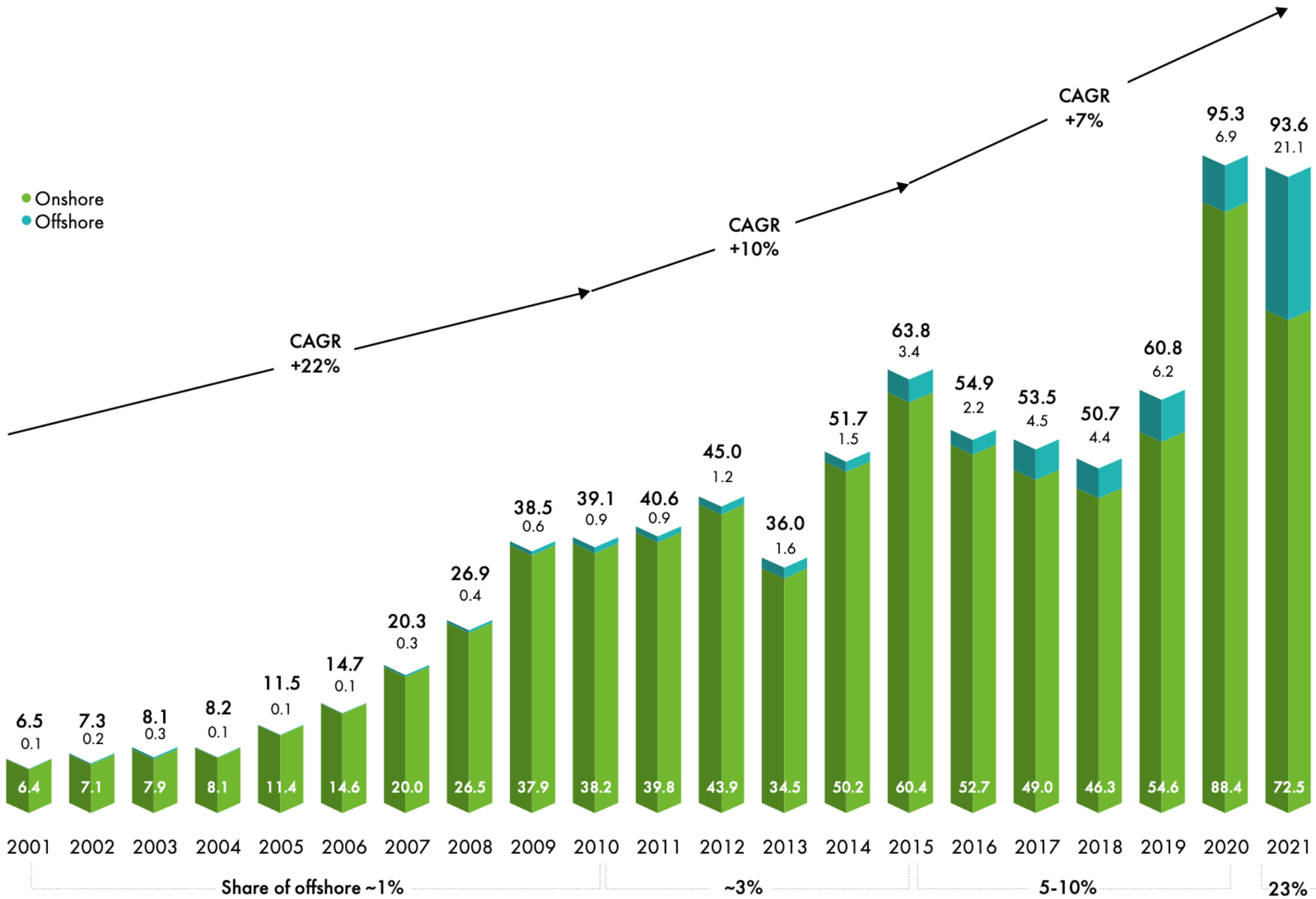

*WTG Concrete Tower Joint Compression Stresses*

# Why now is a very good time for Precast Concrete Towers ?

# Steel vs Concrete Towers



# The Wind Market in 2,022




*Source : GWEC Global Wind Energy Council*

# What we could make from fib ?

- Joint TG 6.4 and

  ✦ Contribute to disseminate concrete wind towers technical knowledge

  ✦ Contribute to develop the scientific background needed for the concrete towers to reliably integrate as a component for a sophisticated machine

# Precast concrete is the present and the future for WTG Towers

*46 Concrete Wind Towers farm in production in Brasil (Calter)*

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TG6.4 Wind towers

*47 Concrete Wind Towers farm in production in Brasil (Calter)*