

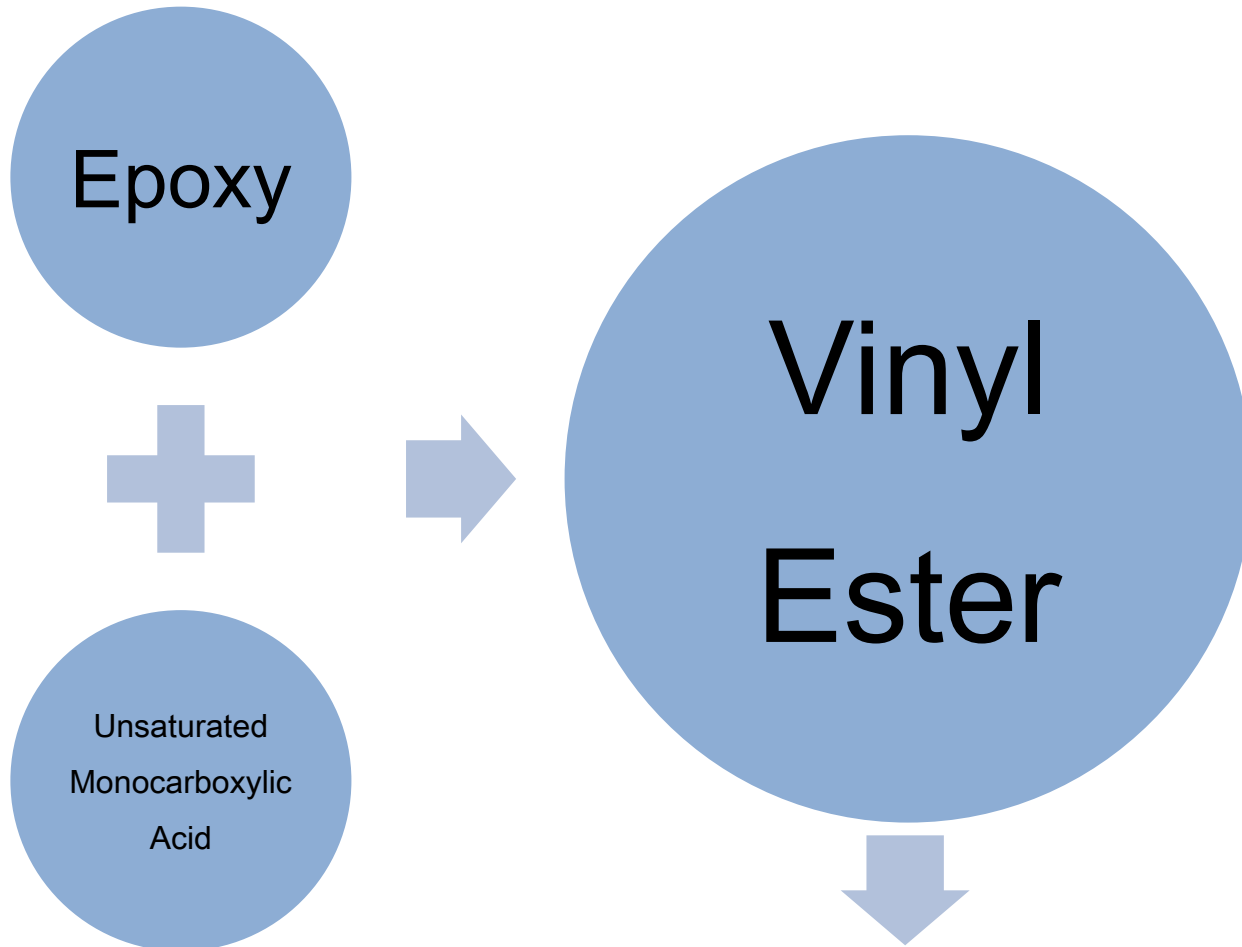
# Vinyl Esters: Poised for Rapid Growth

Exploring New Applications,  
Developments & Opportunities

-Amit Parekh

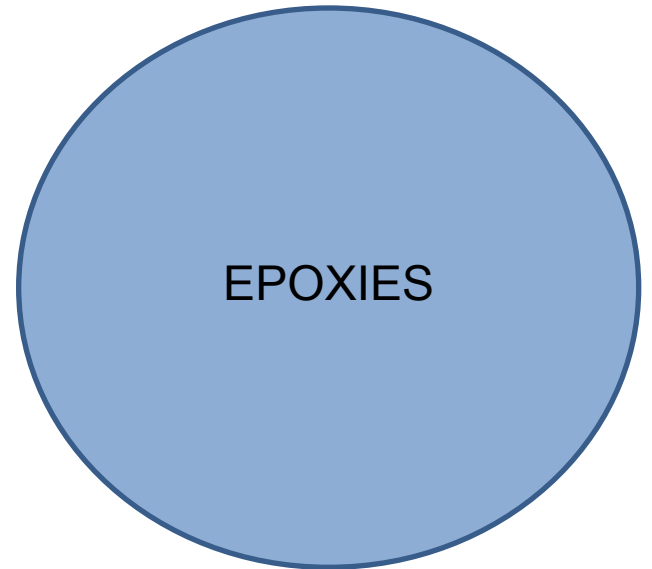
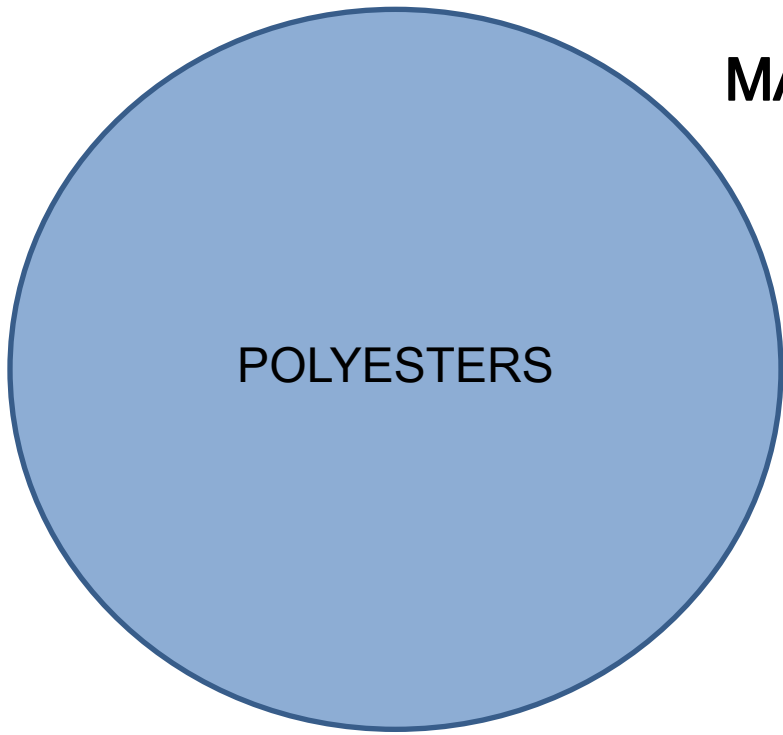


**CREST COMPOSITES & PLASTICS  
PRIVATE LIMITED**



- Exceptional Chemical Resistance
- Excellent Mechanical Properties
- Excellent Fracture Toughness, Impact & Elongation Properties
- Very easy to use and handle
- Suitable to any process
- Highly versatile and customisable material

# MARKET TREND...A DECADE BACK

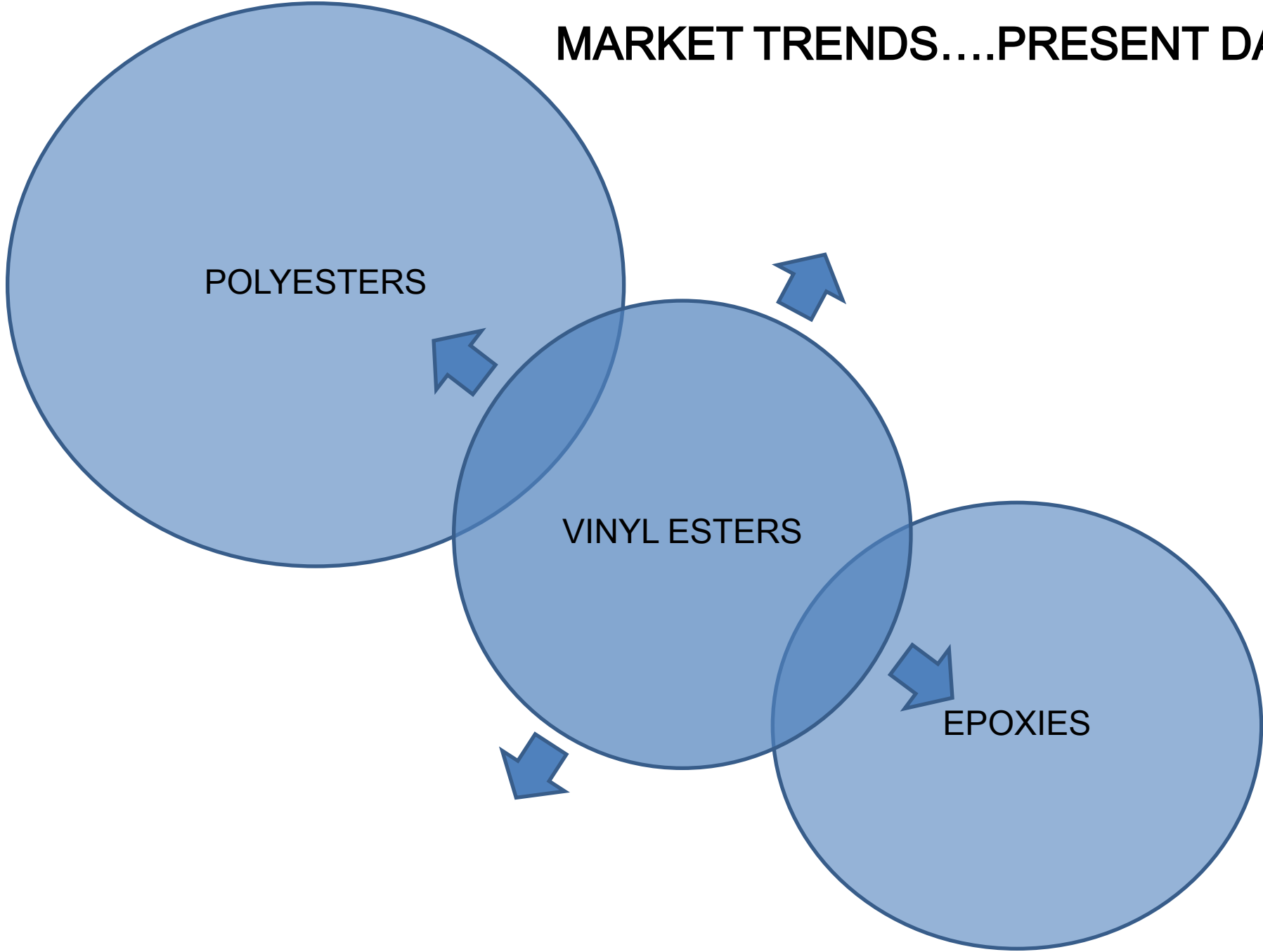


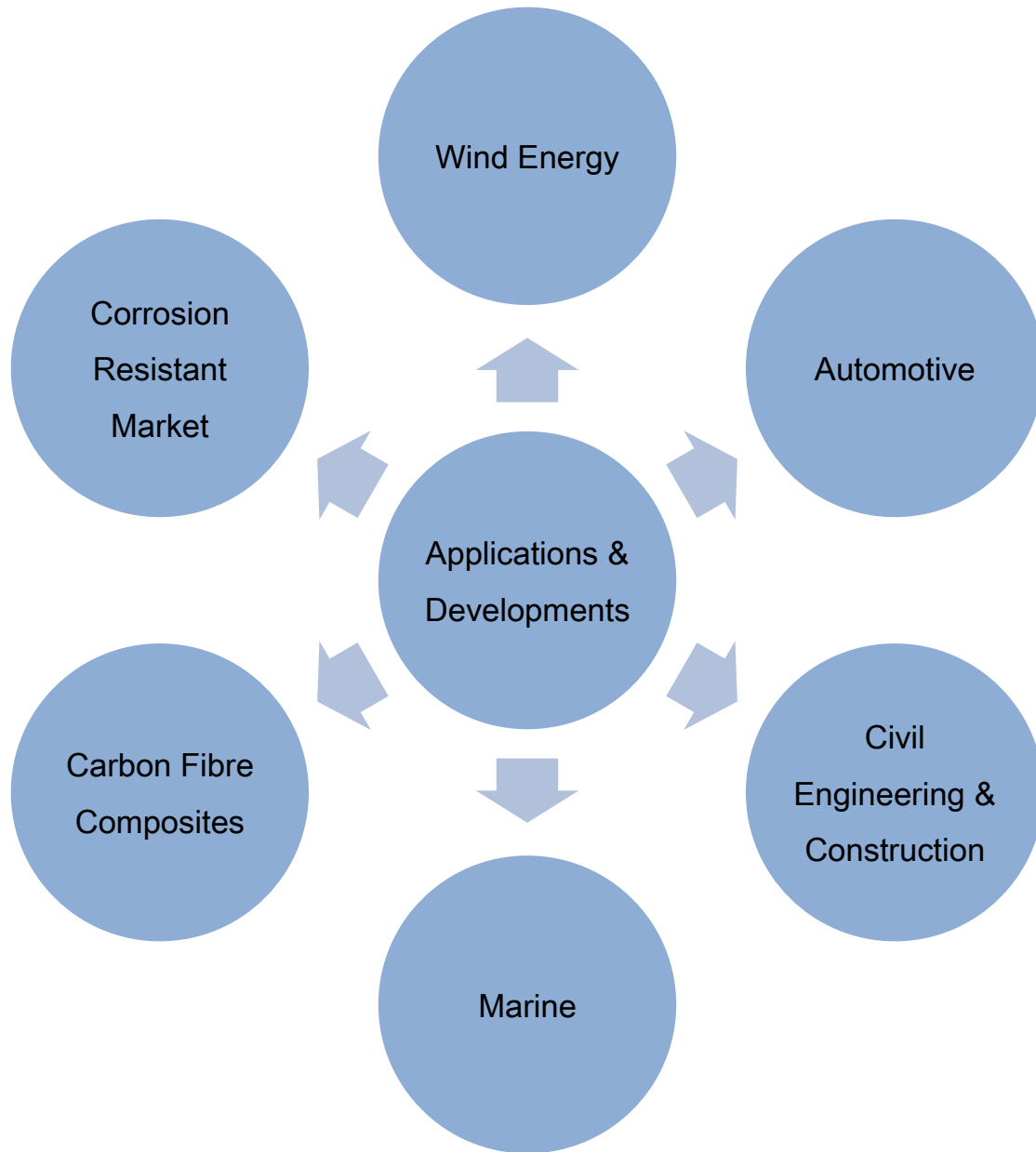
# MARKET TRENDS....PRESENT DAY

POLYESTERS

VINYL ESTERS

EPOXIES

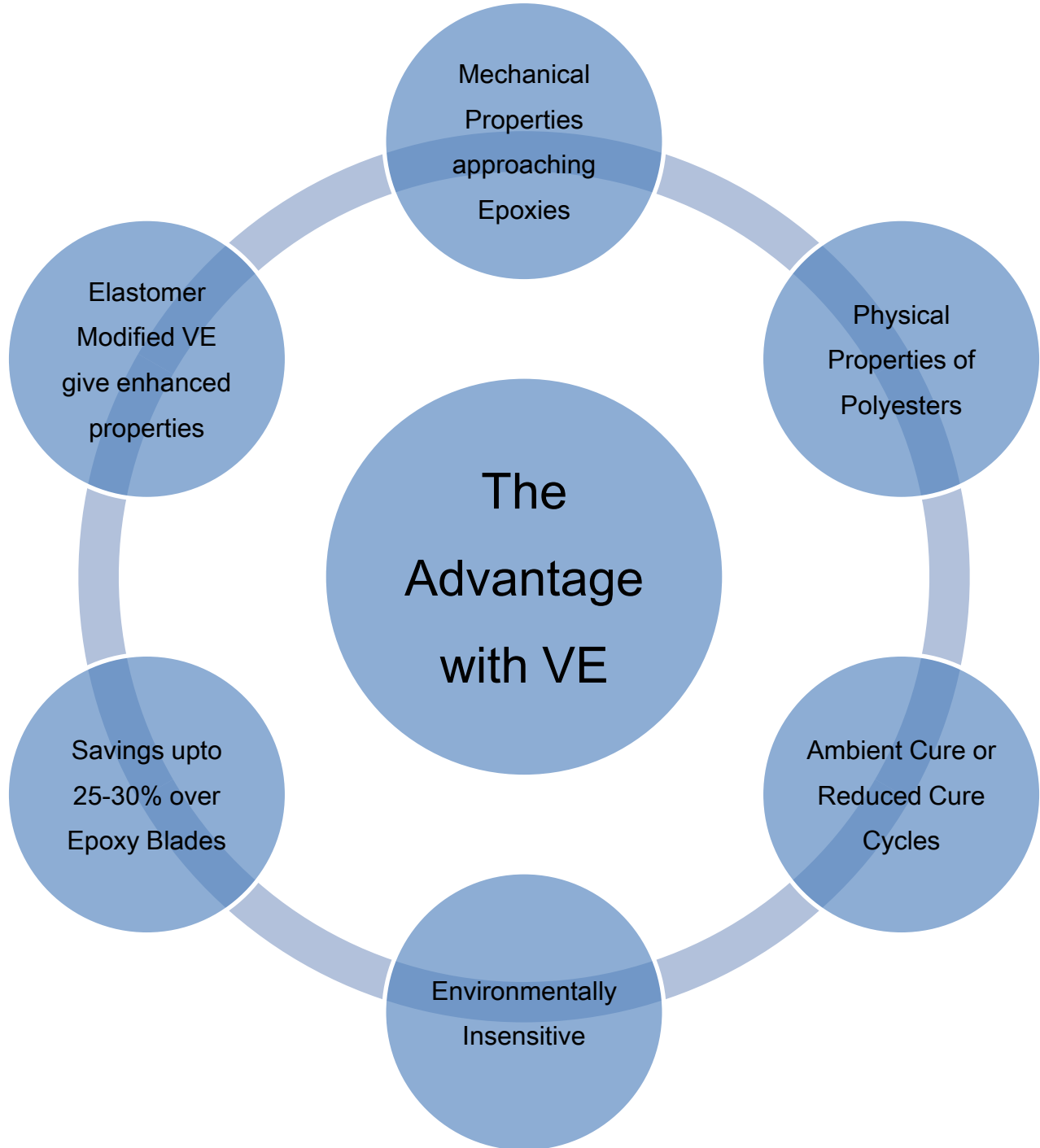






The Advantage with Vinyl Esters

**WIND ENERGY**



Mechanical  
Properties  
approaching  
Epoxies

Physical  
Properties of  
Polyesters

Ambient Cure or  
Reduced Cure  
Cycles

Environmentally  
Insensitive

Savings upto  
25-30% over  
Epoxy Blades

Elastomer  
Modified VE  
give enhanced  
properties

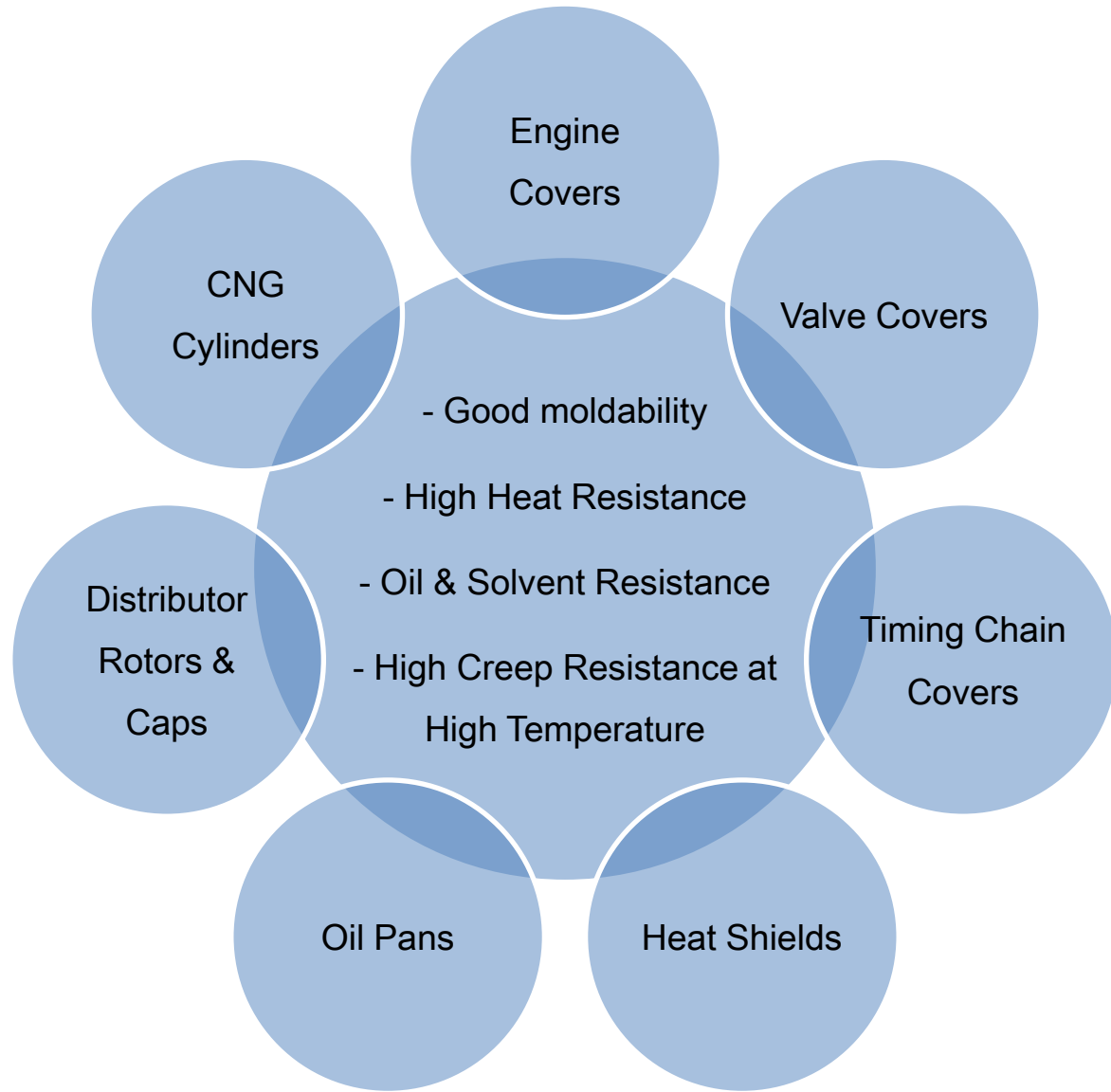
The  
Advantage  
with VE



Giving Composites That Extra Edge

**AUTOMOTIVE**





Engine  
Covers

Valve Covers

Timing Chain  
Covers

Heat Shields

Oil Pans

Distributor  
Rotors &  
Caps

CNG  
Cylinders

- Good moldability
- High Heat Resistance
- Oil & Solvent Resistance
- High Creep Resistance at High Temperature

ICERP 2011

ICERP/IEC INNOVATION AWARDS





Making Composites Competitive

# **CIVIL ENGINEERING & INFRASTRUCTURE**

## Growth Drivers:

Composite  
Rebars &  
Tendons

- Corrosion of Steel
- Rising Prices of Steel
- High Fabrication,  
Logistics & Maintenance  
Costs of Steel & Other  
Conventional Materials

Structural  
Beams,  
Columns &  
Plates

Trenchless  
Piping

Cured in Place  
Piping (CIPP)

Water Supply &  
Drainage Lines

# Composite Rebars & Tendons

Trenchless  
Piping

Growth Drivers:  
- Corrosion of Steel  
- Rising Prices of Steel  
- High Fabrication,  
Logistics & Maintenance  
Costs of Steel

Structural  
Beams,  
Columns  
& Plates

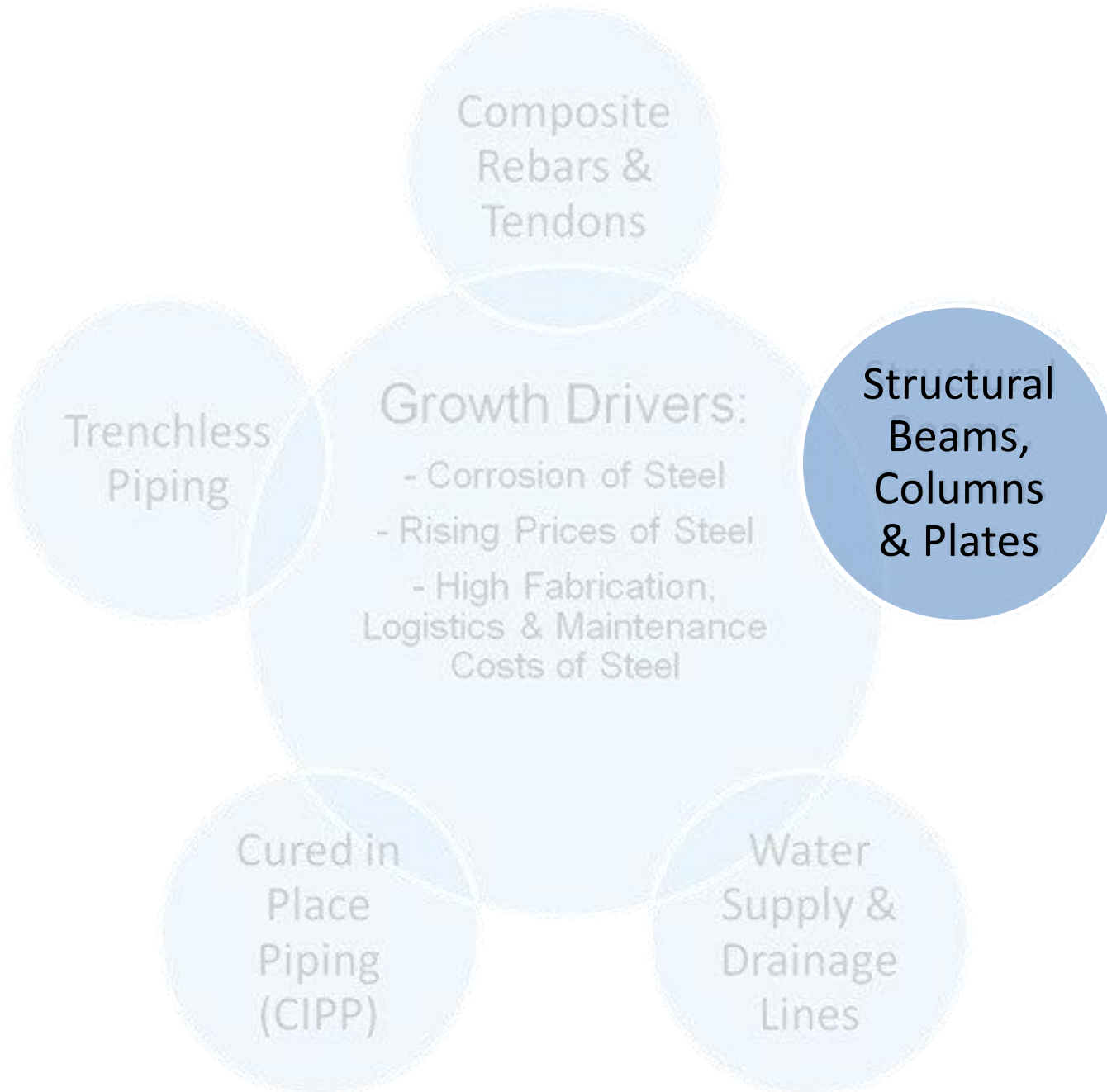
Cured in  
Place  
Piping  
(CIPP)

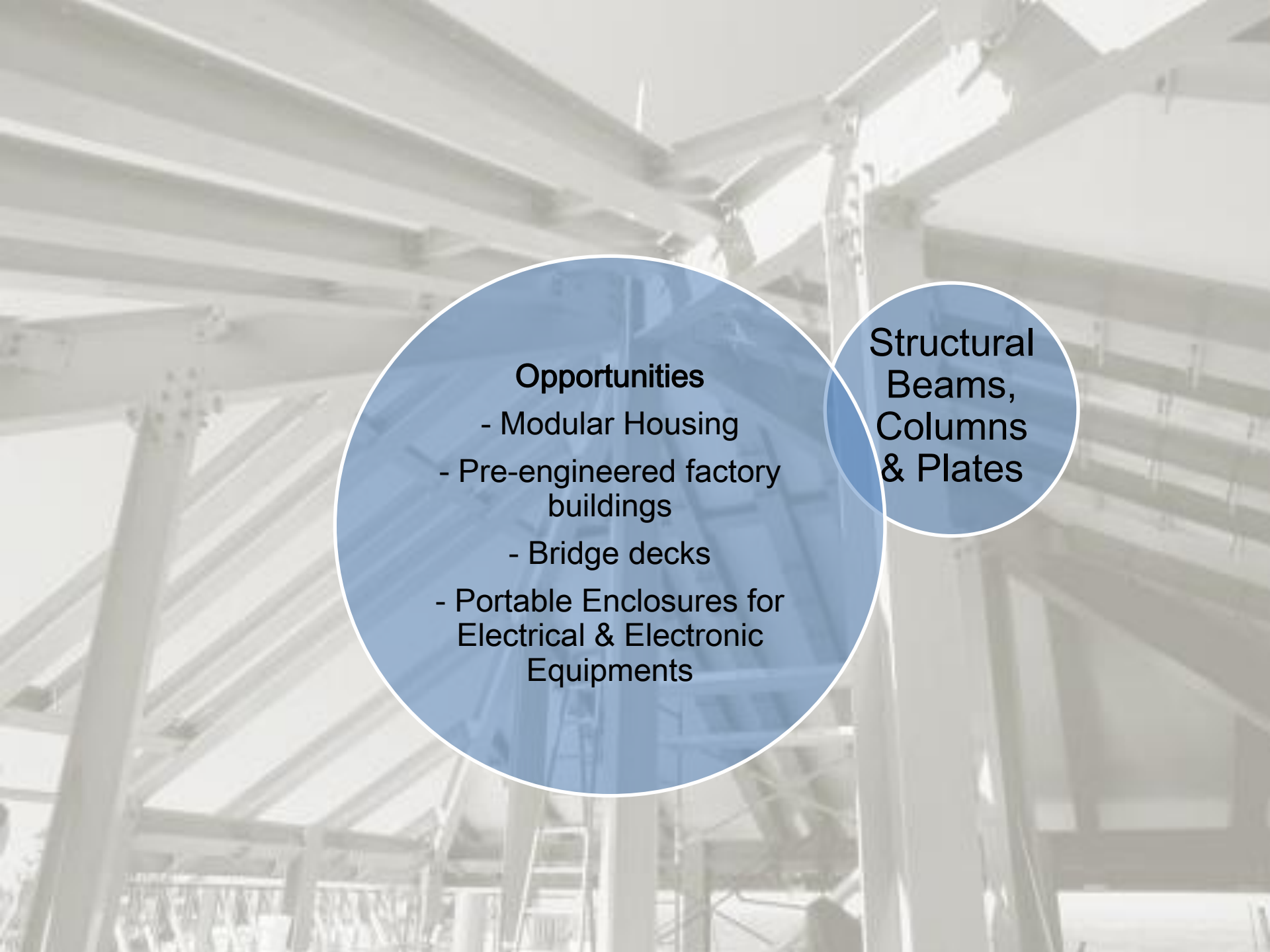
Water  
Supply &  
Drainage  
Lines

# Composite Rebars & Tendons

## Opportunities

- Competitive to Epoxy Coated Steel
- Bridges, Underground Tunnels etc.
  - Structures near coastal regions
  - Structures within chemical plants
  - Offshore Structures



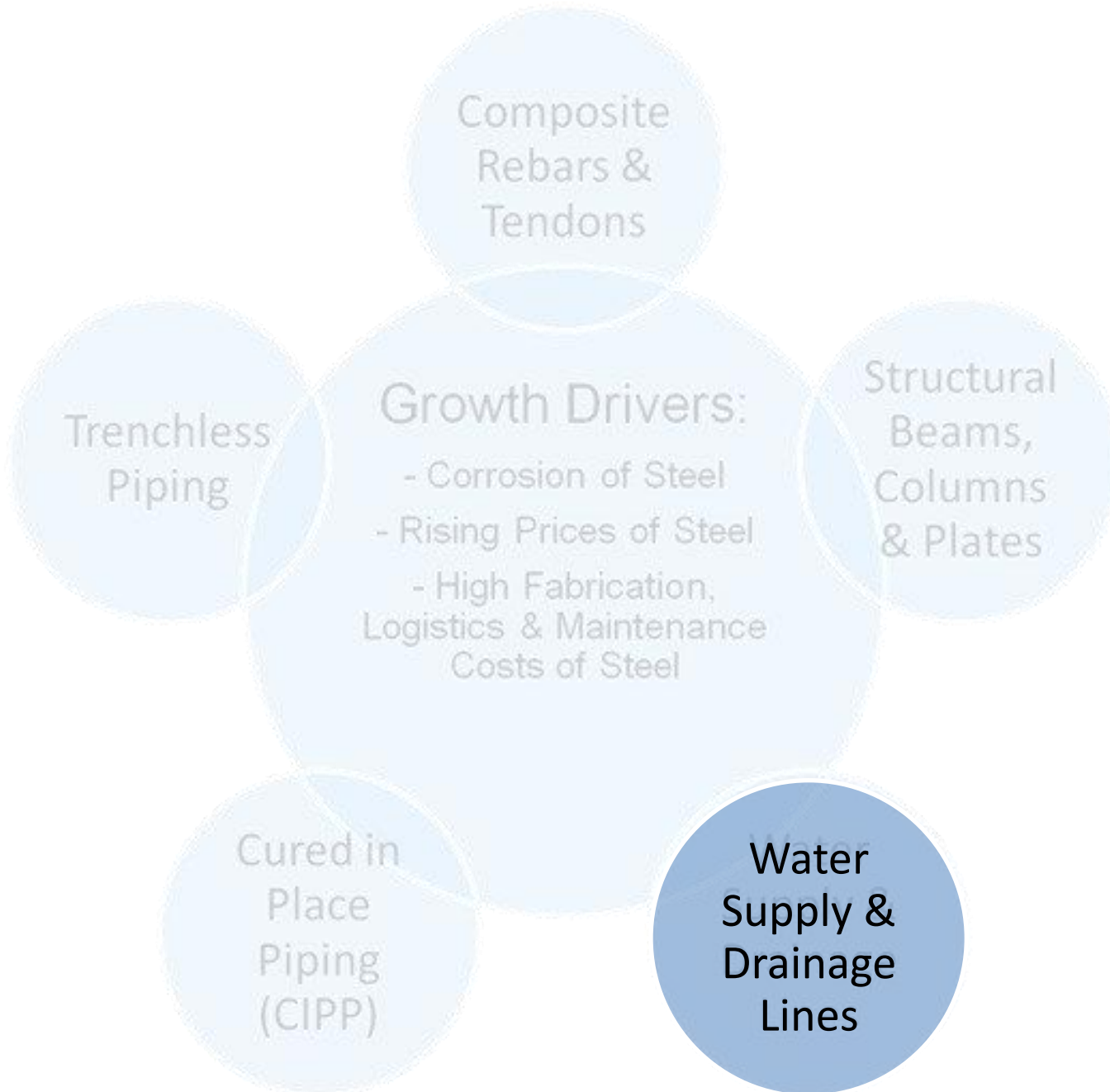


**Structural  
Beams,  
Columns  
& Plates**

**Opportunities**

- Modular Housing
- Pre-engineered factory buildings
- Bridge decks
- Portable Enclosures for Electrical & Electronic Equipments



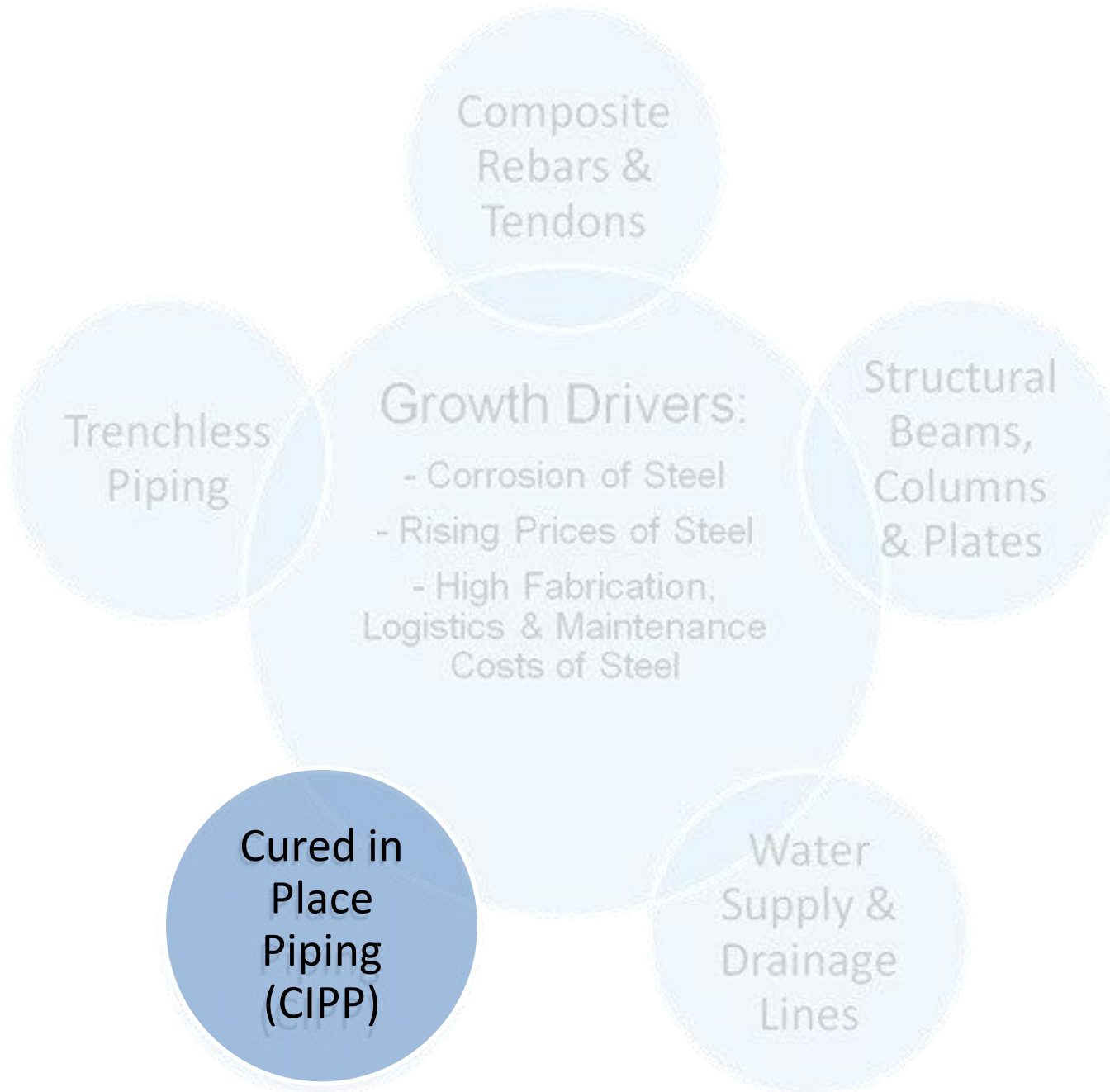


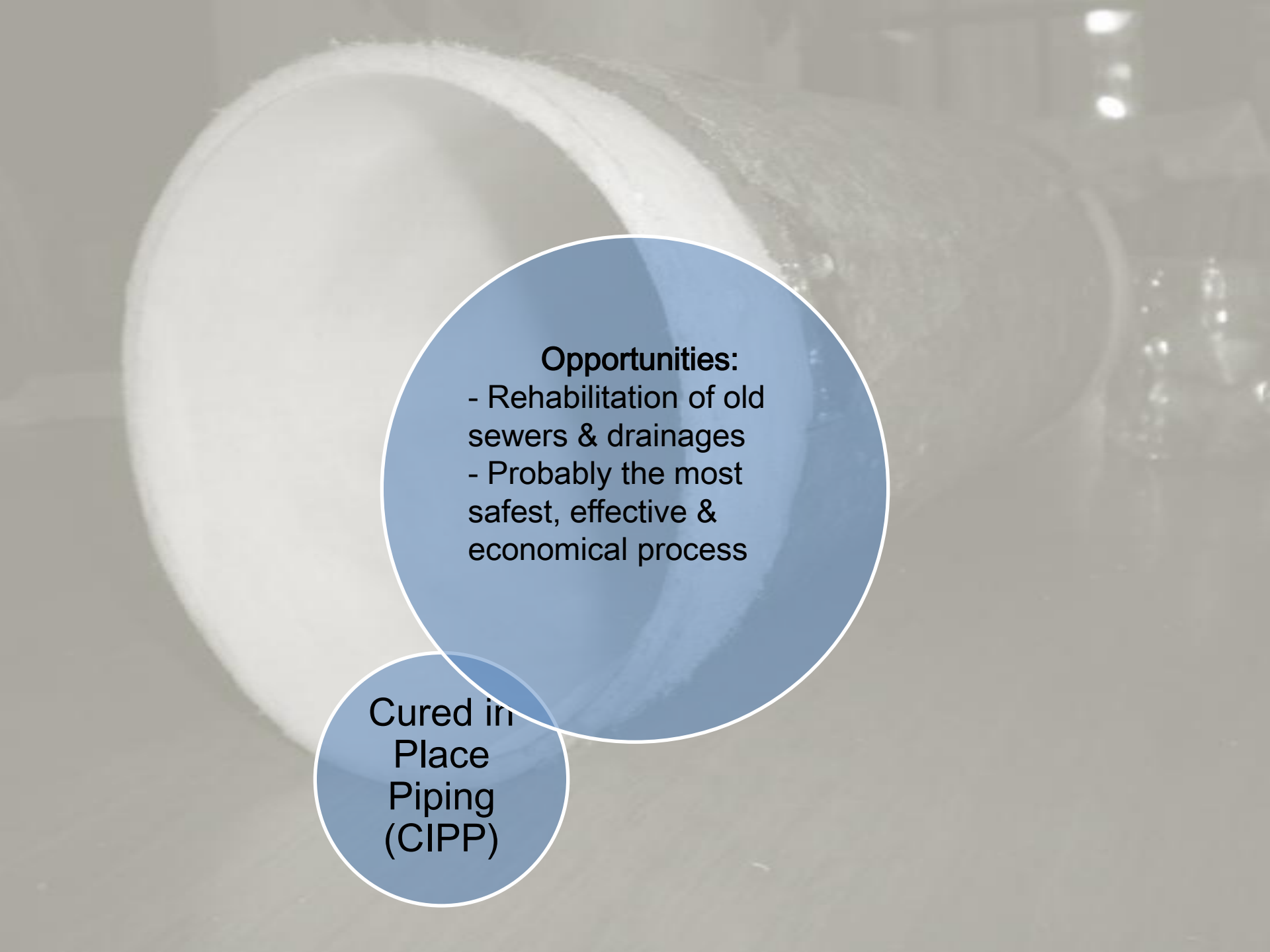


**Opportunities:**

- VE Lined GRP Pipes  
known to give 50  
years life for potable  
water & sewer  
applications

**Water  
Supply &  
Drainage  
Lines**





Cured in  
Place  
Piping  
(CIPP)

**Opportunities:**

- Rehabilitation of old sewers & drainages
- Probably the most safest, effective & economical process

# Trenchless Piping

Composite Rebars & Tendons

**Growth Drivers:**

- Corrosion of Steel
- Rising Prices of Steel
- High Fabrication, Logistics & Maintenance Costs of Steel

Structural Beams, Columns & Plates

Cured in Place Piping (CIPP)

Water Supply & Drainage Lines



## Trenchless Piping

### **Opportunities:**

- Installation of municipal pipelines
- Rehabilitation of old pipelines & sewers



Riding the Rough Seas

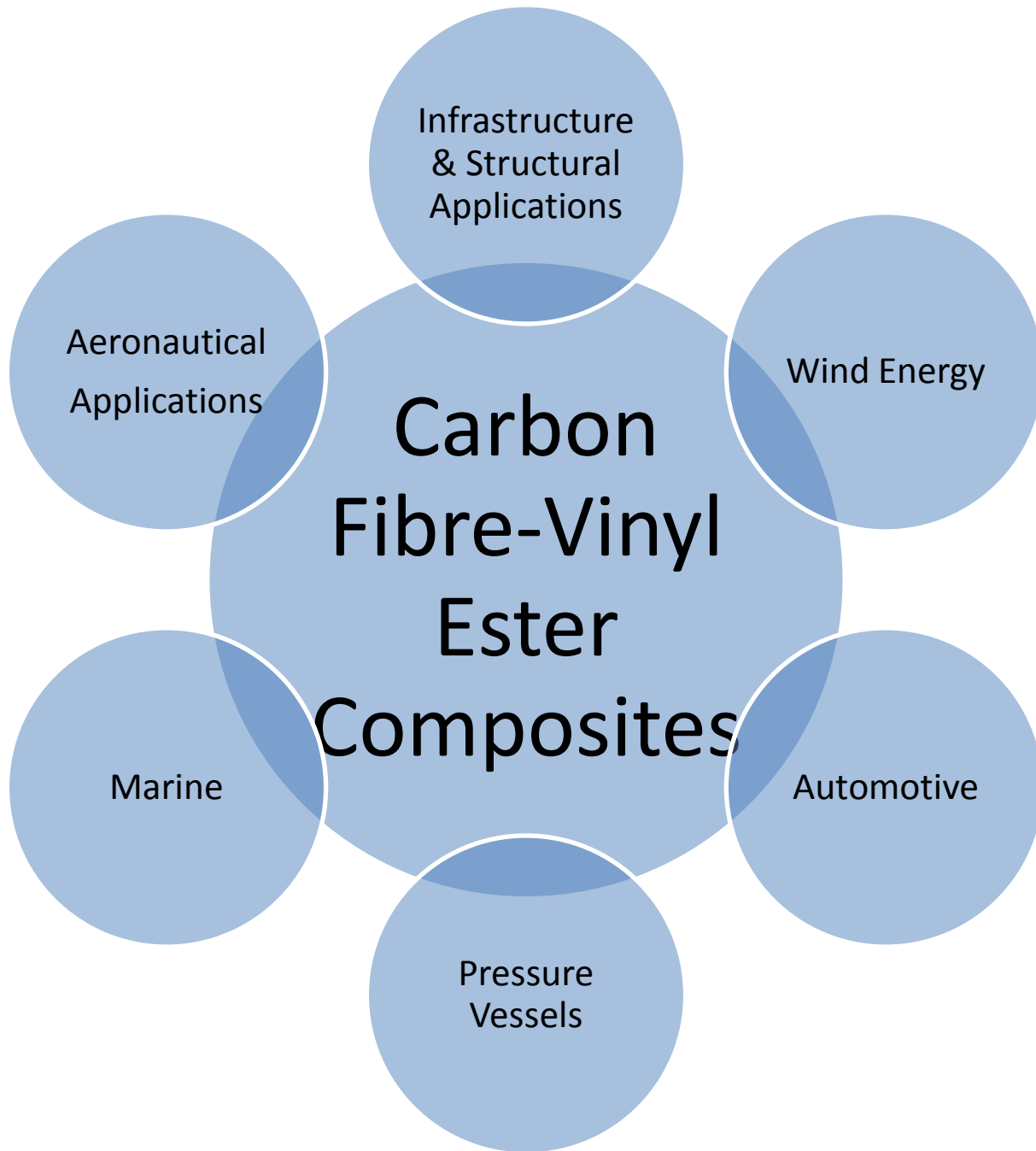
**MARINE**





Steadfast towards the future

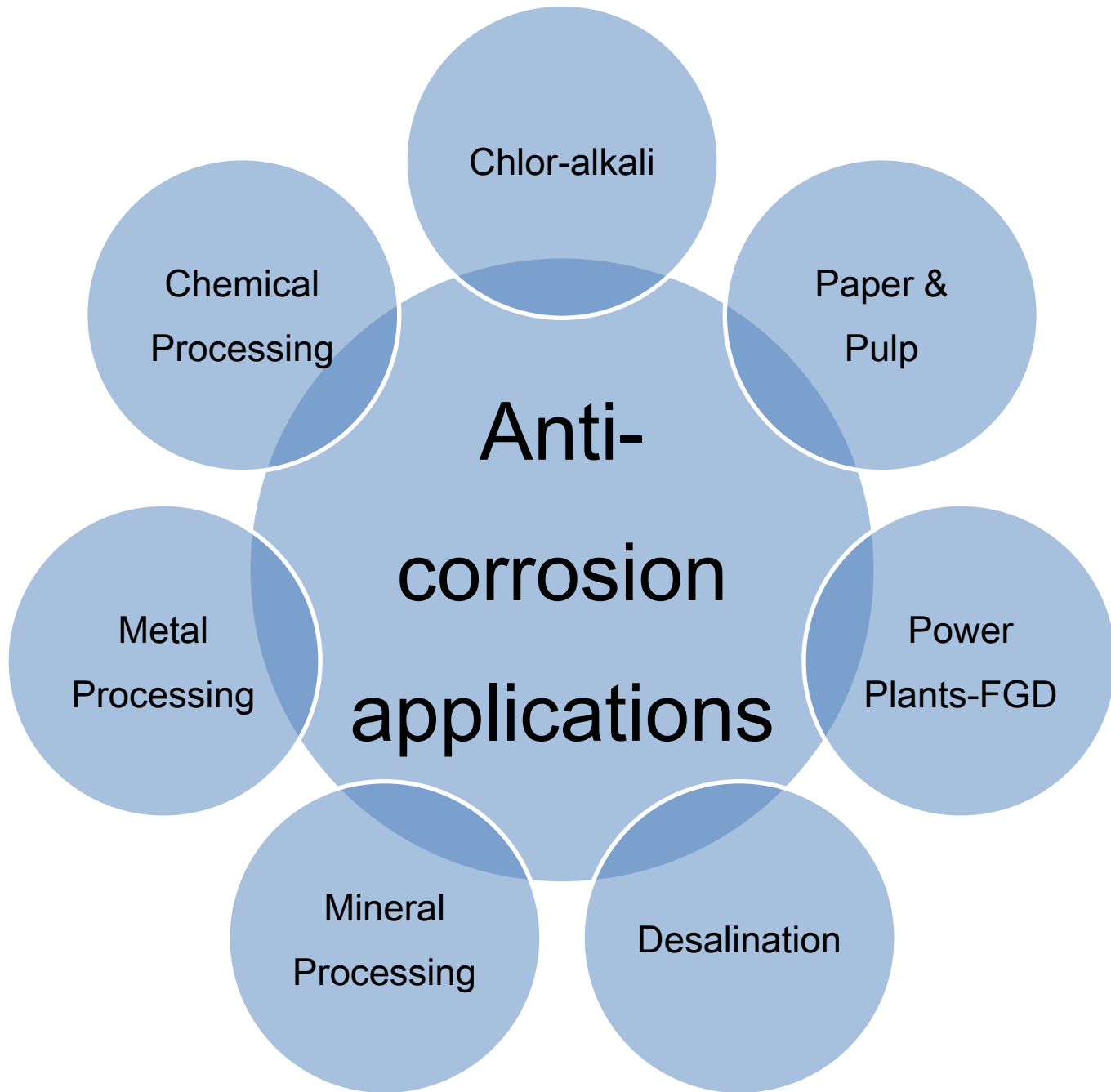
# **CARBON FIBRE-VINYL ESTER COMPOSITES**



A grayscale photograph of an industrial facility, likely a refinery or chemical plant. The foreground and middle ground are dominated by a long, parallel row of large, cylindrical storage tanks. Each tank is covered with a white, protective tarp or plastic sheeting. The tanks are supported by a metal framework and are connected to a network of pipes and valves. In the background, more industrial structures, including distillation columns and storage tanks, are visible under a clear sky. The overall scene conveys a sense of scale and industrial complexity.

Homeground

# **CORROSION RESISTANCE**



**THANK YOU.**