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# CPIC BRASIL

## Reforços para o Mercado Eólico

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为大众提供更好的安居、更舒适的生活

FOR BETTER LIVING BETTER LIFE

# AGENDA

**1** INFORMAÇÃO RELEVANTES PARA O MERCADO

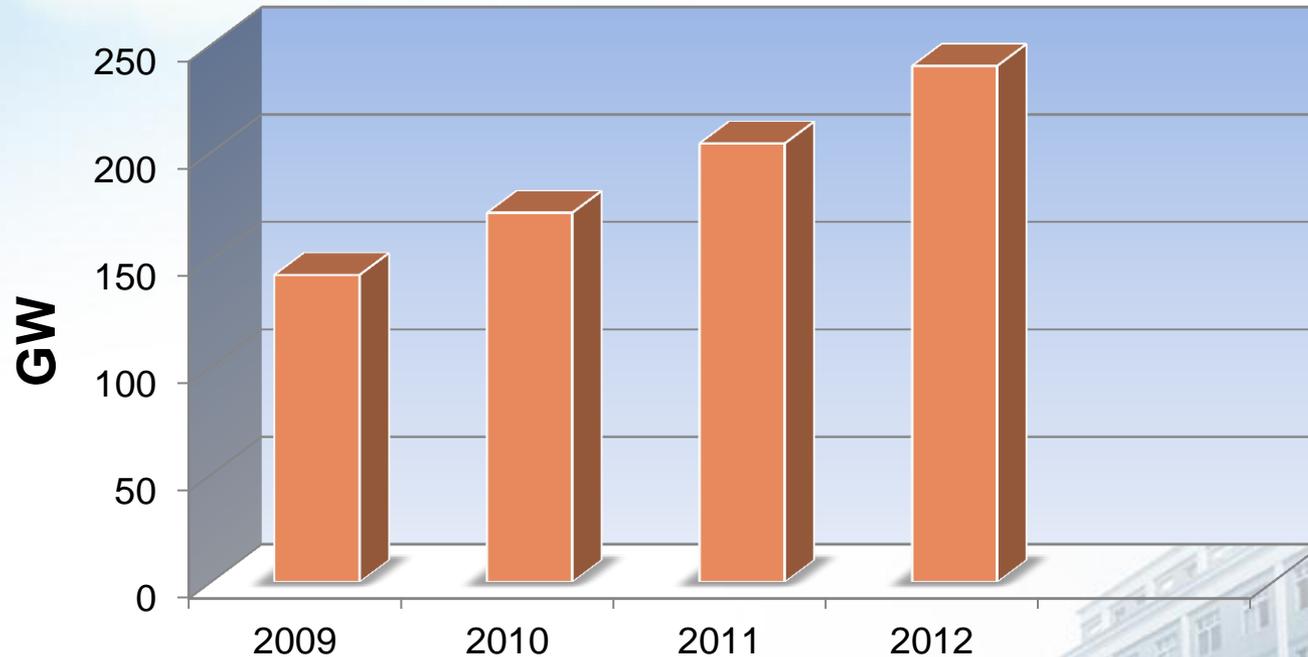
**2** CPIC CHINA – APRESENTAÇÃO

**3** CPIC BRASIL – APRESENTAÇÃO

# CAPACIDADE INSTALADA NO MUNDO EM 2011

- A capacidade de energia eólica instalada no mundo cresceu 21% em 12 meses, passando de 197.000 para 238.000 MW (equivalente a 17 vezes a potência instalada de Itaipu, igual a 14.000 MW);
- Segundo estatísticas do Conselho Global de Energia Eólica, Em relação à última década, o crescimento da capacidade mundial foi de quase **sete** vezes.
- Mais de 40% do aumento total ocorreu na China, cuja capacidade instalada saltou para 62.000 MW. No Brasil, o crescimento foi de 62%, passando de 927 para 1509 MW.

# CRESCIMENTO GLOBAL



**“A energia eólica vai gradualmente se tornar a energia principal alternativa”**

# POTENCIAL ENERGÉTICO

➤ Atualmente o Brasil gera 75 GW de energia Hidroelétrica.

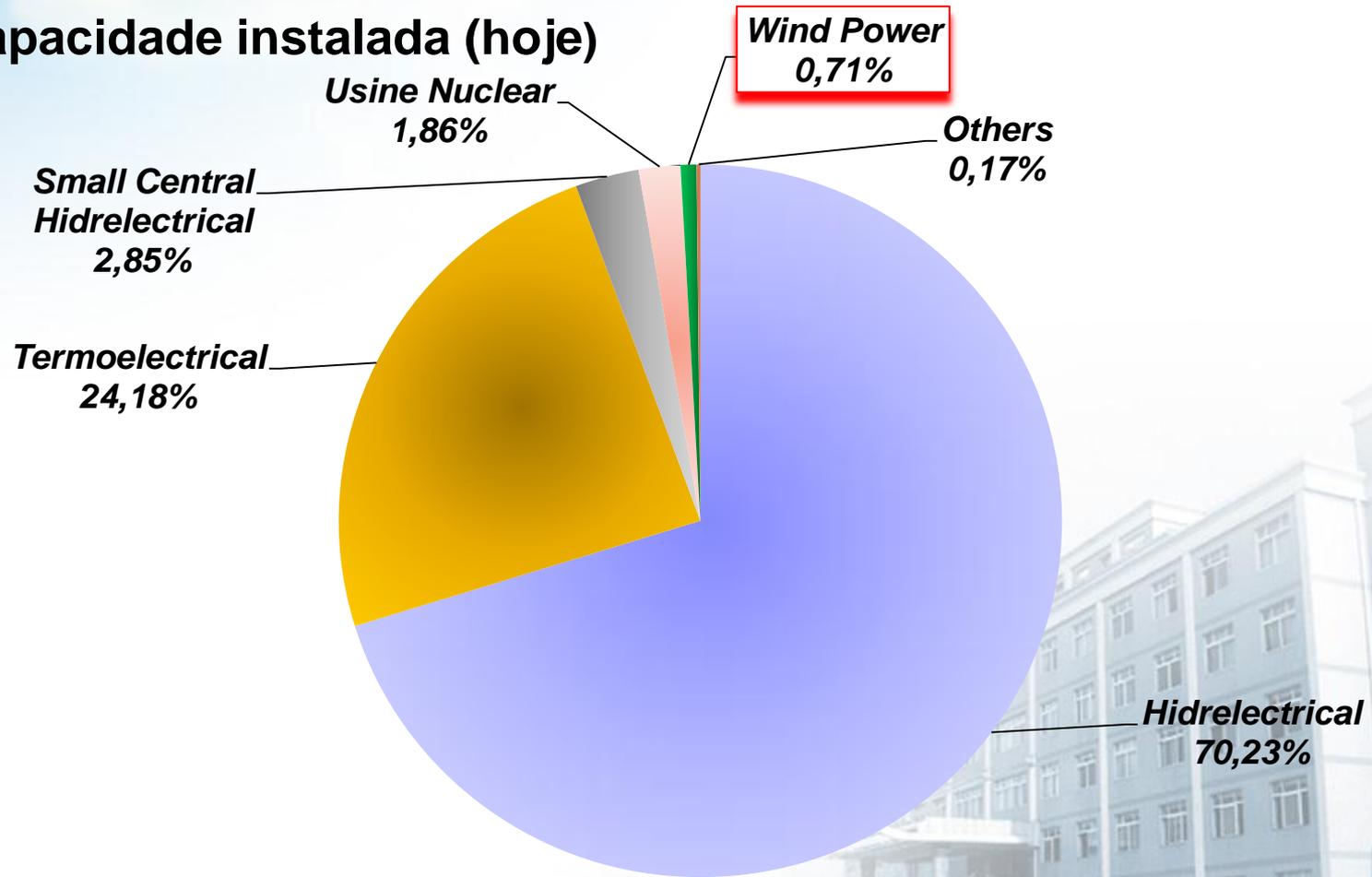
Porém, tem potencial para gerar 250 GW !!!

➤ Atualmente o Brasil gera 2 GW de energia eólica.

Porém, tem potencial para gerar 300 GW !!!

# CENÁRIO BRASILEIRO

## Capacidade instalada (hoje)



# INVESTIMENTO ENERGIA EÓLICA

- A energia eólica é a fonte de geração de energia elétrica que mais cresce no Brasil.
- 7 GW já estão contratados e deverão ser instalados garantindo negócios da ordem de USD18 bi nos próximos anos.
- A expectativa do setor elétrico brasileiro é de contratar pelo menos 2,5 GW por ano até 2020, movimentando cerca de USD50 bi.

# PARQUE EÓLICO BRASILEIRO

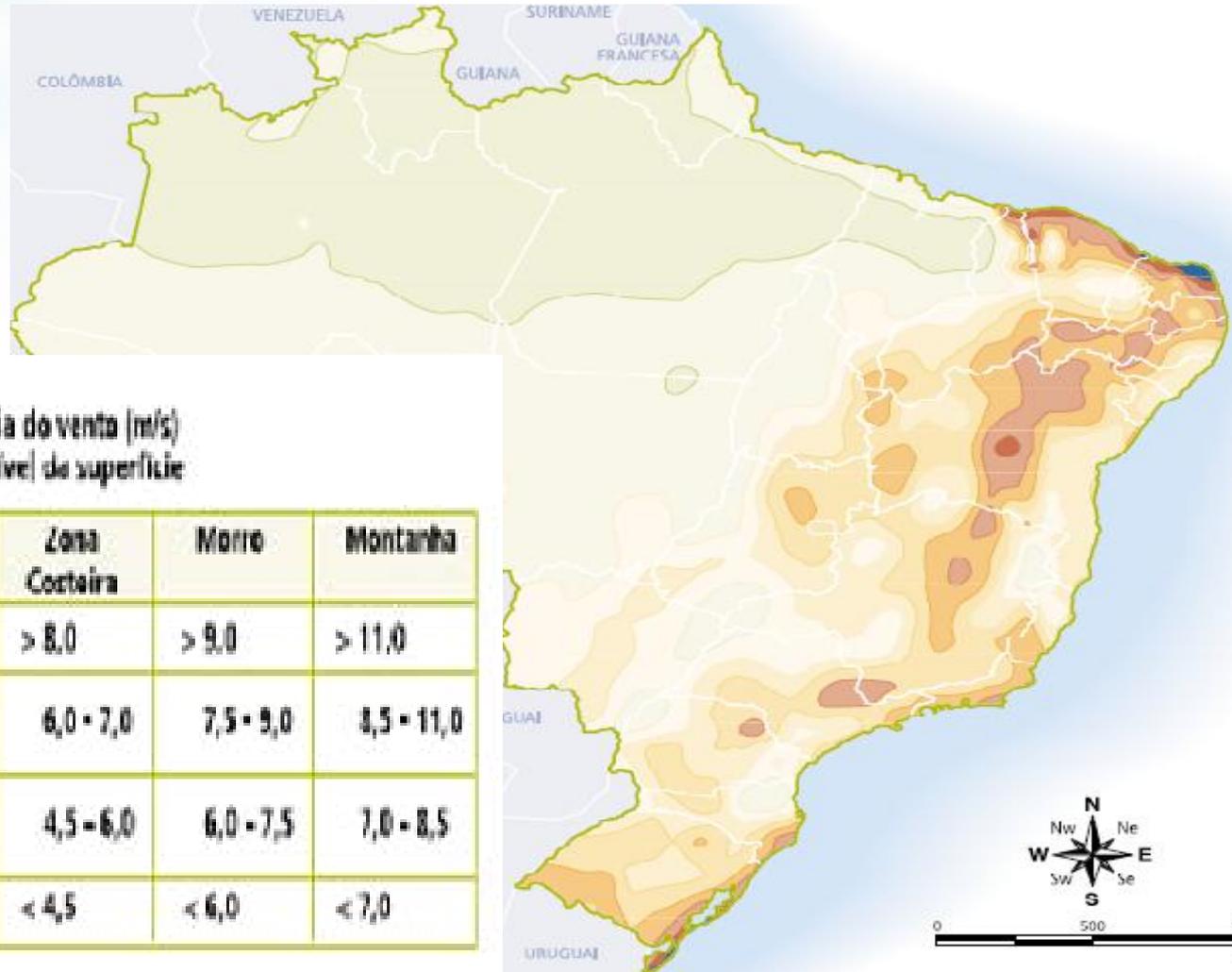


## DISTRIBUIÇÃO

A maior parte dos parques eólicos se concentra nas regiões nordeste e sul do Brasil. No entanto, quase todo o território nacional tem potencial para geração deste tipo de energia.

Fonte: João Tavares Pinho,  
Universidade Federal do Pará  
(UFPA) e ANEEL - Agência  
Nacional de Energia Elétrica

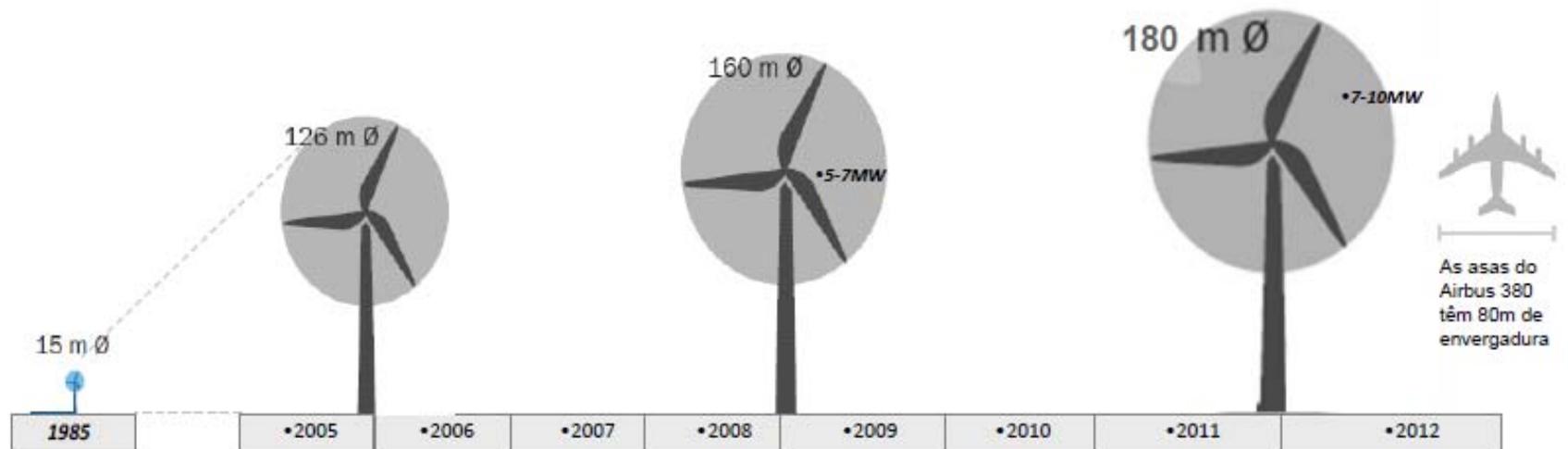
# POTENCIAL EÓLICO BRASILEIRO



Velocidade média do vento (m/s)  
50 m acima do nível da superfície

	Mata	Campo Aberto	Zona Costeira	Monte	Montanha
4	> 6,0	> 7,0	> 8,0	> 9,0	> 11,0
3	4,5 - 6,0	6,0 - 7,0	6,0 - 7,0	7,5 - 9,0	8,5 - 11,0
2	3,0 - 4,5	4,5 - 6,0	4,5 - 6,0	6,0 - 7,5	7,0 - 8,5
1	< 3,0	< 4,5	< 4,5	< 6,0	< 7,0

# EVOLUÇÃO DOS AEROGERADORES



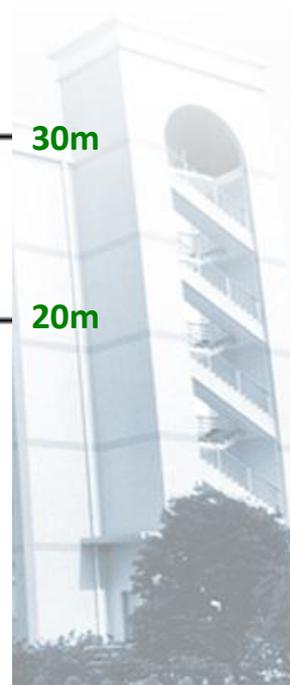
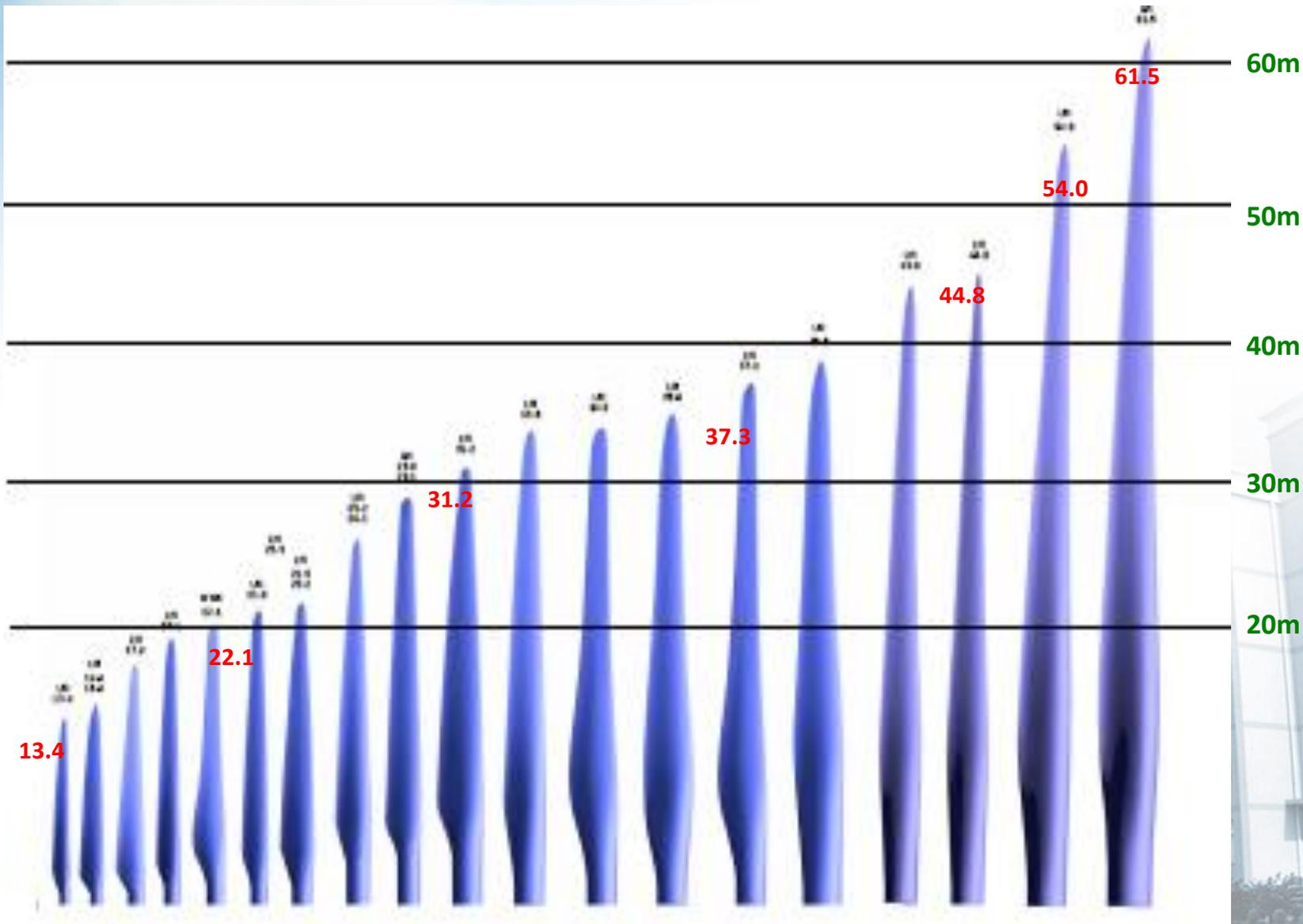
**Tendências Tecnológicas**

*Turbinas estão se tornando mais compridas / Parques eólicos estão ficando maiores  
Maior industrialização das empresas*

**Soluções Tecnológicas**

*Exigência para soluções de reforço para possibilitar pás mais longas, leves  
com menor custo e com melhor performance a fadiga*

# EVOLUÇÃO DOS TAMANHOS DAS PÁS



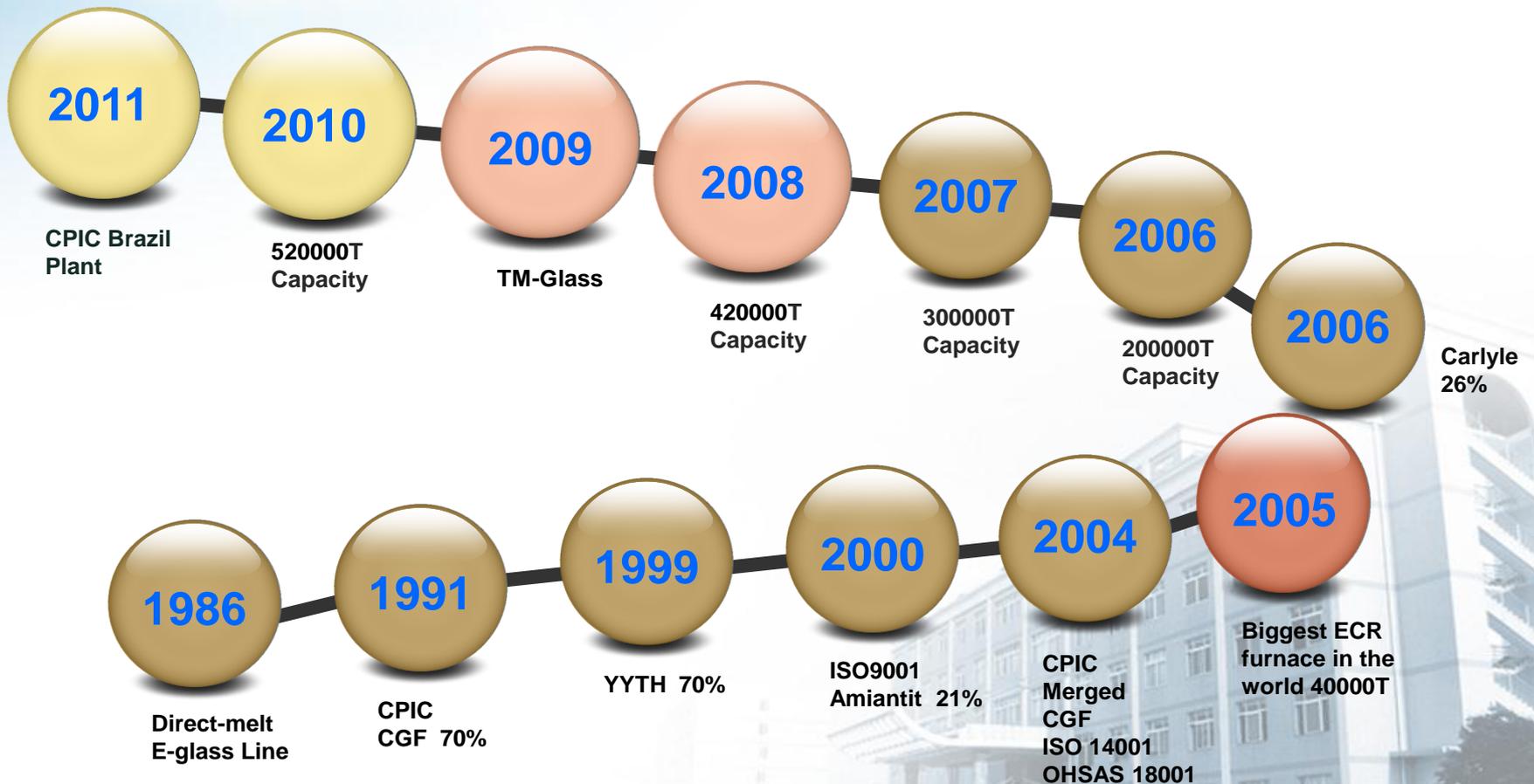
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# CPIC GLOBAL



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FOR BETTER LIVING BETTER LIFE



- **CPIC** - Chongqing Polycomp International Corporation
  - Joint venture entre o grupo YYTH, grupo de investimento Carlyle e o grupo Amiantit;
  - A CPIC possui 3 bases de produção;
  - 12 linhas de produção de Fibra de Vidro
  - Capacidade anual: 550.000MT
  - Tipos de vidro: E – ECR – ECT – TM (alto modulo)
  - Colaboradores: 5.480 pessoas
  
- **CPIC BRASIL** – CPIC Brasil foi o primeiro investimento da CPIC fora da China, isso representa o compromisso de desenvolver o mercado de compósitos do mundo.



**DaDuKou Base**



CPIC/FIBERGLASS

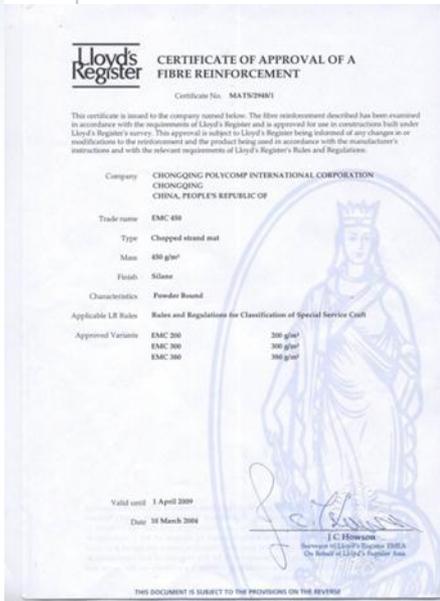
**ChangShou Base**





**Quality Management System Certification**  
**In May of 2001 CPIC was through ISO9001 initially.**  
**In Mar of 2005 CPIC was through OHSAS18001: 1999 by British BSI organization.**

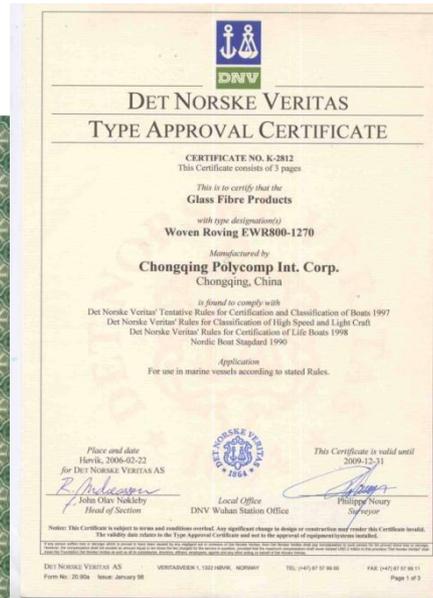
# CERTIFICADOS DE PRODUTOS



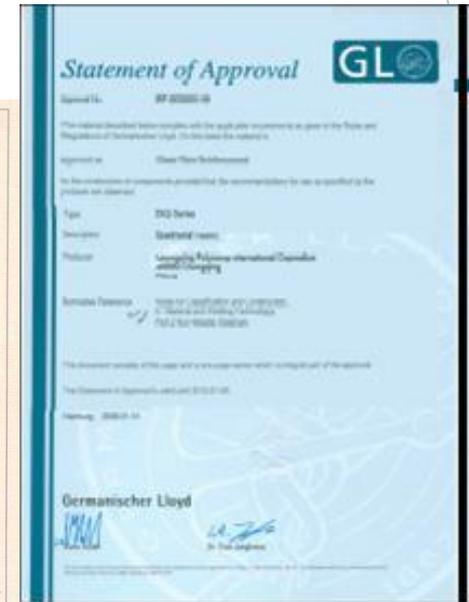
Lloyd's Register



Certification of FDA compliance



Det Norske Veritas (DNV) certification



German GL certification



# Tecido Multi-Axial



## Product information:

CPIC MULTI-AXIAL FIBERGLASS FABRICS include Unidirectional Fabrics ( $0^\circ$  or  $90^\circ$ ), Biaxial Fabrics ( $0^\circ$ ,  $90^\circ$ ), ( $\pm 45^\circ$ ), Triaxial Fabrics ( $0^\circ$ ,  $\pm 45^\circ$ ), ( $90^\circ$ ,  $\pm 45^\circ$ ), and Quadraxial Fabrics ( $0^\circ$ ,  $90^\circ$ ,  $\pm 45^\circ$ ). The entire or partial warp ( $0^\circ$ ), weft ( $90^\circ$ ) and double bias ( $\pm 45^\circ$ ) plies are stitched into a single fabric. Without filament crimp in woven roving, CPIC multi-axial fabrics are in advantage of high strength, excellent stiffness, low weight and thickness, as well as the improved fabric surface quality.

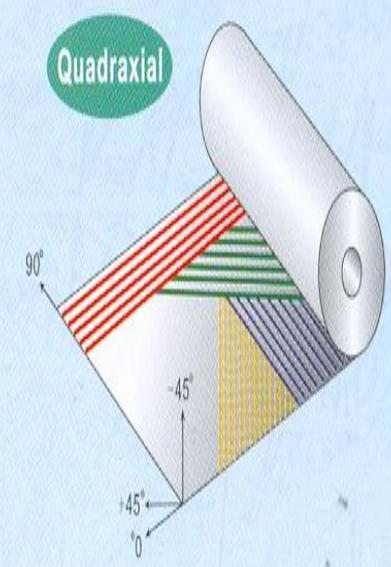
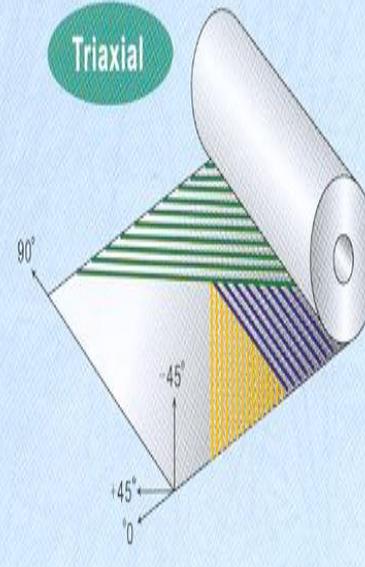
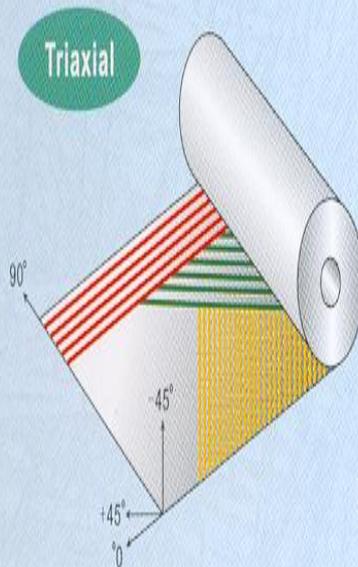
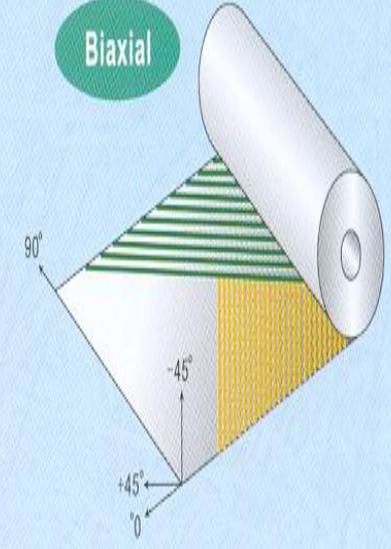
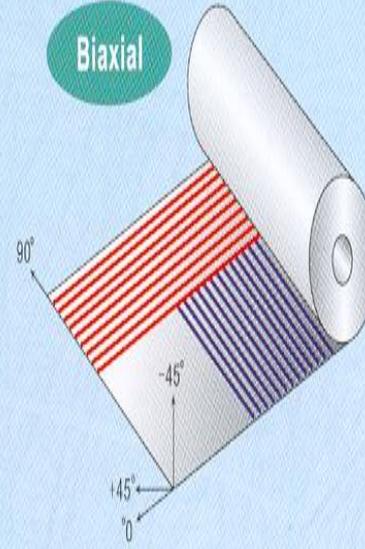
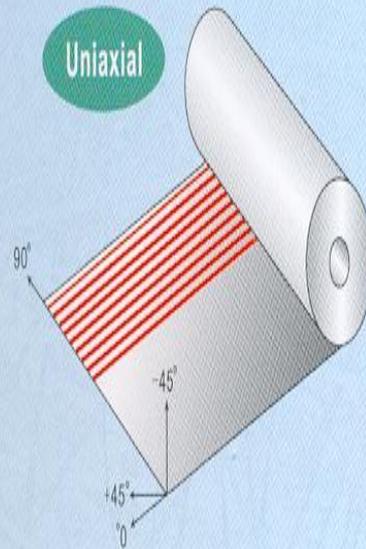
CPIC can add chopped strand mat or tissue on the surface or in the middle of multi-axial fabrics, competent to fulfill customer's special requirements.

## Product code:

**EKT 900 (0, +45, -45) / T50E-1260**

E: E-glass	无碱玻璃	Areal weight / layer( $\text{g}/\text{m}^2$ )克重: 900
K: Knitting	编织物	Fabric construction 织物结构: $0^\circ$ , $+45^\circ$ , $90^\circ$ , $-45^\circ$
U: Unidirectional	单轴向	Chopped strand: 短切纱 300、225
B: Biaxial	双轴向	Tissue: 薄毡 50
T: Triaxial	三轴向	E: Epoxy 环氧专用
Q: Quadraxial	四轴向	width 宽幅(mm): 1260

# Tecidos Multi-Axiais





# Especificações dos Tecidos Multi-Axiais

PRODUCT CODE	Each layer weight							Total weight (g/m <sup>2</sup> )
	0°	+45°	90°	-45°	Stitching	CSM	ST	
<b>Unidirectional</b>								
EKU900(0)E-1260	885		80		8			973
EKU1150(0)/50E-420	1150		50		8	50		1258
EDW600-1285	8.5		600					608.5
<b>Biaxial</b>								
EKB600(0,90)/240-1270	317		283		6	240		846
EKB800(0,90)/300-1270	441		407		6	300		1154
EKB450(+45,-45)-1260		225		225	6			456
EKB800(+45,-45)E-1270		401		401	6			808
EKB1000(+45,-45)E-1270		501		501	8			1010
EKB1200(+45,-45)E-1270		601		601	8			1210
EKB1800(+45,-45)E-1270		902		902	8			1812
<b>Triaxial</b>								
EKT750(0,+45,-45)E-1270	283	225		225	6			739
EKT870(0,+45,-45)E-1270	496	183		183	8			870
EKT870(+45,90,-45)E-1270		183	496	183	8			870
EKT900(0,+45,-45)/T50E-1260	425	225		225	8		50	933
EKT1200(0,+45,-45)E-1270	567	301		301	8			1177
EKT1200(0,+45,-45)E-1270	709	250		250	8			1217
EKT1200(+45,90,-45)E-1270		250	709	250	8			1217
EKT1250(+60,90,-60)E-1270		300	640	300	8			1248
<b>Quadraxial</b>								
EKQ800(0,+45,90,-45)-1270	213	200	200	200	8			821
EKQ1200(0,+45,90,-45)-1270	283	300	307	300	8			1198



# Tecidos Bidirecionais



## Identification of product code

**EWR 800 - 300**

- E-glass woven roving
- Unit weight
- Width(mm)

### Description:

EWR series is made of E-glass direct roving-Utilized in FRP manufacturing process. Suitable for manufacturing bathtub, boat, tank and other FRP products.

Technical characteristic

1. Moisture content: < 0.1%
2. Loss on ignition: 0.3-0.8
3. Coupling agent: Silane
4. Unit weight  $\pm 5\%$

### Properties:

1. Rapid wet-out and excellent impregnation
2. High mechanical strength
3. Plain weave, trimmed feather
4. Compatible with polyester, epoxy, vinylester resin
5. Adjustable construction of weaving

### Product characteristics:

Product code	EWR300 / 360 / 400 / 450 / 500 / 540 / 580 / 600 / 800 / 820 / 1450 / 1560
Width	300mm-2500mm
Length	50m-200m
Remarks	Length, width density construction is open.

# Mantas Costuradas



## Identification of product code

**E** **MK** **300** - **1270**

- E-glass
- Mat Knitting
- Unit weight, Unit: g/m<sup>2</sup>
- Width, Unit: mm

### Description:

E-glass stitched mat is made from chopped fiber-glass strands randomly dispersed and laid on a roving matrix and stitched together with organic fibers. Stitched Mat is used primarily in pultrusion, RTM, filament winding and hand lay-up processes. Typical products include pultruded parts, pipe, storage tanks, wind generator blades and other FRP products.

1. Moisture content: 0.1%
2. Coupling Agent: Silane
3. Compatible Resin: Polyester
4. Filament Diameter: chopped strand: 11-13 μ m, roving: 14/17 μ m

### Properties:

1. Even thickness, high wet tensile strength retention, on strand interlocking and low distortion.
2. Directional properties and strengths equal to woven roving.
3. Flexibility to design different weaving structures.
4. Very little material required to achieve maximum tensile strength properties.

### Product characteristics:

Product code	Total Unit Weight(g/m <sup>2</sup> )	Mat Unit Weight(g/m <sup>2</sup> )	Roving Unit Weight(g/m <sup>2</sup> )	Width(mm)	Number of Layer	Additional Information(Base)
EMK300	300	300	-	200~2540	1	No base cloth
EMK380	380	380	-	200~2540	1	No base cloth
EMK450	450	450	-	200~2540	1	No base cloth
EMK500	500	500	-	200~2540	1	No base cloth
EMK900	900	900	-	200~2540	1	No base cloth
EMK300/300	600	300	300	200~2540	2	
EMK300/500	800	300	500	200~2540	2	
EMK300/600	900	300	600	200~2540	2	
EMK450/580	1030	450	580	200~2540	2	
EMK450/600	1050	450	600	200~2540	2	
EMK450/800	1250	450	800	200~2540	2	



# Mantas Agulhadas

## Product code introduction

**EMN 600 - 1000 - 4**

- E glass needle mat
- The area density of the mat
- The width of the mat
- The thickness of the mat

### Product introduction:

The needle mat produced by CPIC is made of the E glass fiber with finer filament by needle mat manufacturing machine. Tiny voids formed in the manufacturing process impart excellent heat insulation property to the product. The non-binder content in the finished products together with the good heat insulation and electrical properties of E glass make the needle mat an out-standing and environmental friendly product within the insulation material field.

### Characteristics of the product:

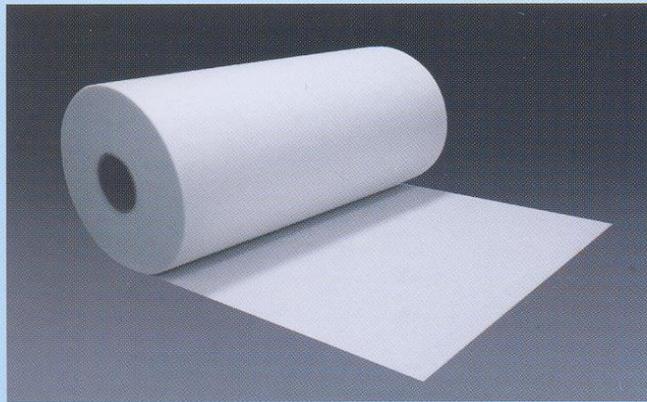
1. Low heat conduction coefficient, excellent Heat insulation performance.
2. High service temperature of 500 to 700°C.
3. Made of inorganic fiber which is fire retardant, no toxic gases emission in fire.
4. Excellent chemical stability, no water adsorption, etching and mildewing.

### Product catalog

Production code	Thickness (mm)	Width (mm)	Bulk density (Kg/m <sup>3</sup> )	Weight (Kg/roll)	Length (m)
EMN450-1000-3	3	1000	150	20.3	45
EMN600-1000-4	4	1000	150	24.0	40
EMN750-1000-5	5	1000	150	27.8	37
EMN900-1000-6	6	1000	150	30.6	34
EMN1200-1000-8	8	1000	150	37.2	31
EMN1500-1000-10	10	1000	150	40.5	27
EMN1800-1000-12	12	1000	150	41.4	23
EMN2250-1000-15	15	1000	150	42.8	19
EMN3750-1000-25	25	1000	150	56.3	15



# Véus de Superfície



## Identification of product code

**ST ( ECR ) 25 - 45**

- Surface Tissue
- ECR-glass roving
- Unit weight
- Width(cm)

### Application

CPIC' s Tissue is made of ECR-glass. The Tissue is utilized in roofing and FRP Surface.

Tissue is suitable for pipe, construction, sanitary appliance, automobile, boat, and etc.

### Properties

1. rapid wet-through and wet-out
2. with better surface property
3. waterproof property
4. enhance mechanical strength
5. anti-aging

### Product Description

Glass types	Fiber diameter(um)	Fiber length(mm)	Binder
ECR	7.5/11/13	3/6/12/18	PE resin type

Product code	Unit Weight (g/m <sup>2</sup> )	LOI (%)	Moisture (%)	Thickness (mm)	Tensile breaking force (vertical) (N/50mm)
	ISO 3374	ISO 1887	ISO 3344		
Tissue	≥25	10±2%	≤1	0.15-0.4	≥15

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FOR BETTER LIVING BETTER LIFE

**Início Produção: 1992**

**Reconstrução da Fábrica em 2001: Capivari II**

**Reconstrução da Fábrica em 2012: Capivari III**

**Área terreno: 200.000 m<sup>2</sup>**

**Capivari Base**



# LINHA DE PRODUTOS

<i>Manta</i>	<i>Roving Direto</i>	<i>Roving Assemble</i>	<i>Fios Picados</i>	<i>Fios Cortados</i>	<i>Tecidos</i>	<i>Outros</i>
• <i>M125BR</i>	• <i>688</i>	• <i>P207BR</i>	• <i>983</i>	• <i>P350</i>	• <i>TRB</i>	• <i>Linha RAC</i>
• <i>M200</i>	• <i>689</i>	• <i>P207</i>	• <i>952</i>	• <i>979</i>		• <i>Linha FRC</i>
• <i>M125</i>	• <i>699</i>	• <i>P243</i>	• <i>968</i>	• <i>5314</i>		• <i>Fibra</i>
	• <i>468</i>	• <i>P244</i>	• <i>P335</i>	• <i>93B</i>		<i>Moída</i>
	• <i>469</i>	• <i>P246</i>	• <i>ASF900</i>			• <i>Bulk</i>
	• <i>4305</i>	• <i>ER55B</i>	• <i>ECS303BR</i>			<i>Glass</i>
		• <i>ER107C</i>	• <i>ECS301CL</i>			
		• <i>91 A1</i>	• <i>ECS303A</i>			
			• <i>ECS301HP</i>			
			• <i>ECS305K</i>			

# SISTEMA DE GESTÃO INTEGRADA

- Trabalho Padronizado
- Auditoria de Camadas
- Análise de Causa Raiz – Metodologia 8D
- Cadeia de Ajuda (“Help Chain”)
- Kaizen – Melhoria Contínua
- TPM – Gestão da Performance Total – **(Excelência nos processos)**
- Certificado: ISO 9001, ISO 14001 e OSHA 18001



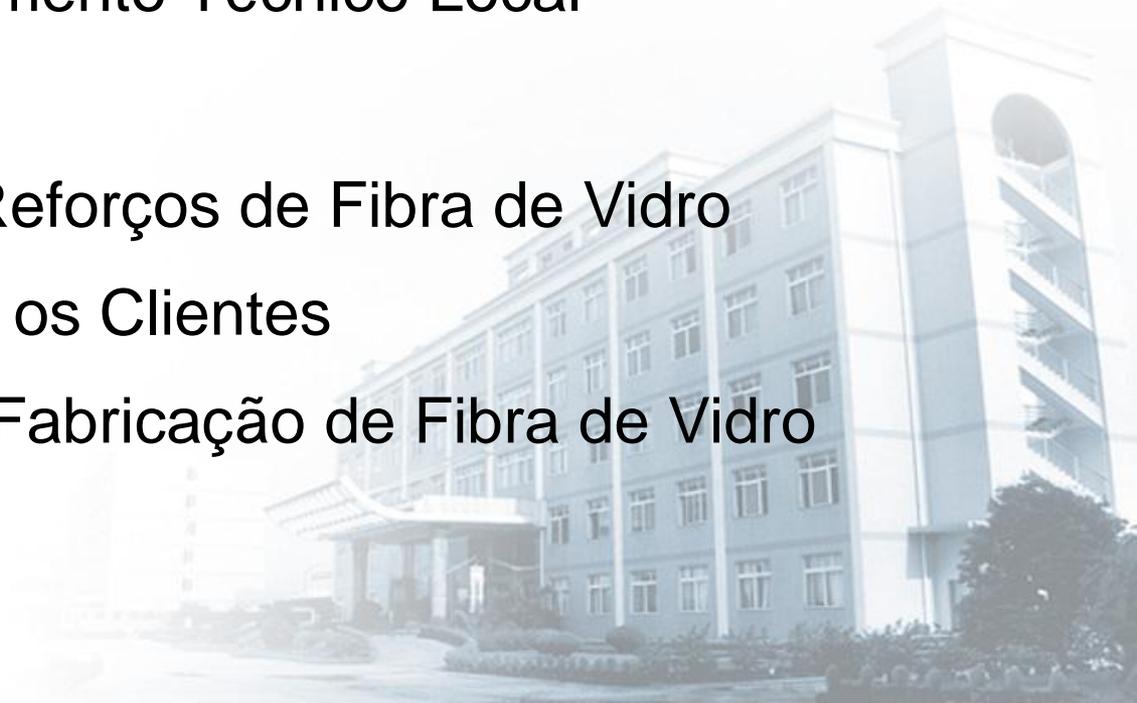
**“Porque ter a CPIC Brasil  
como parceira nos seus  
projetos?”**



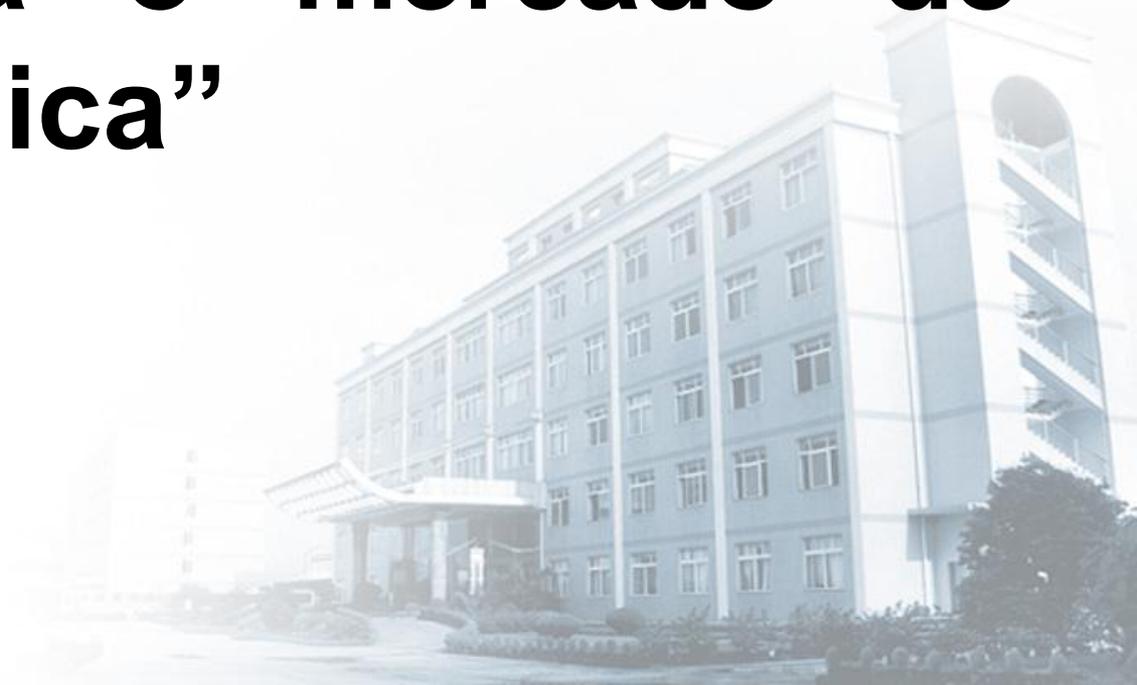


# CPIC BRASIL - VANTAGENS

- Fornecedor Local – Regional para América do Sul
- Faturamento Local
- Assistência Técnica Local
- Grupo de Desenvolvimento Técnico Local
- Logística Local
- Gama Completa de Reforços de Fibra de Vidro
- Baixo Inventário para os Clientes
- Alta Tecnologia para Fabricação de Fibra de Vidro



## **“Visão e Projetos da CPIC Brasil para o mercado de Energia Eólica”**



**MUITO OBRIGADO**

**PAULO BRAGA**



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**Gerente de Pesquisa e Desenvolvimento**

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