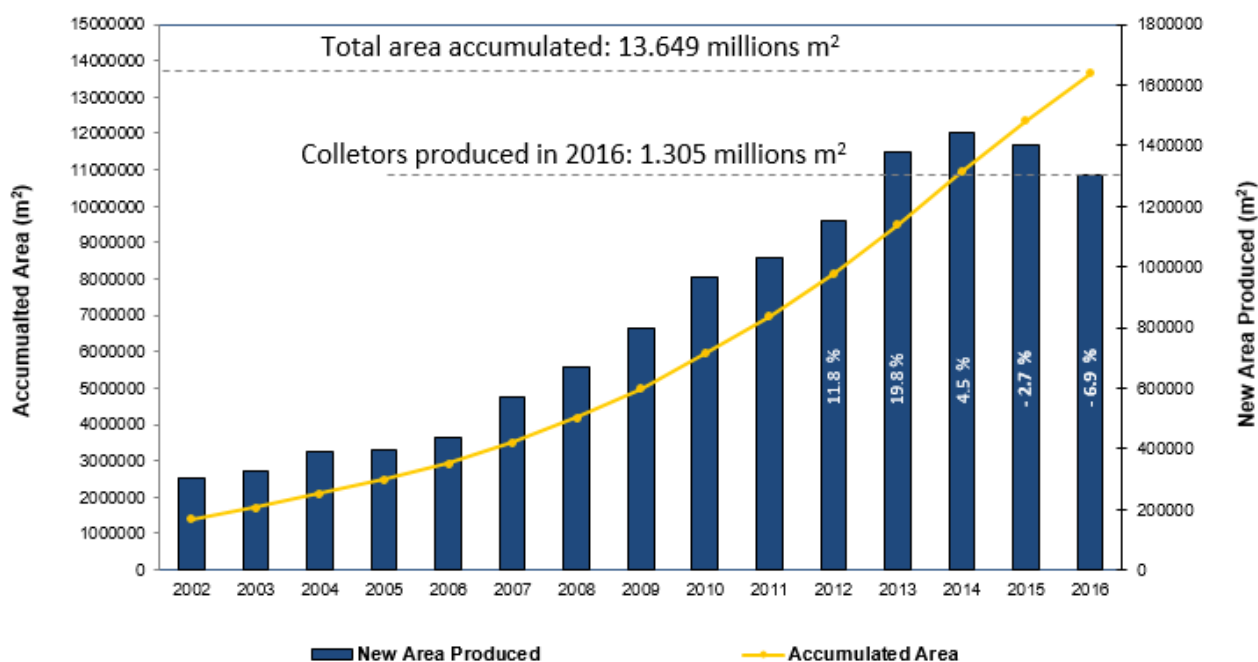


## Production and Sales Research of Solar Heating Systems 2017 (2016 results)

This document shows the sample survey results of solar heating equipment production behavior in 2016 and the sales expectations for 2017, based on information from companies participating in electronic research conducted by ABRASOL from March 27<sup>th</sup> to March 31<sup>th</sup>, whose data were extrapolated to represent the behavior of whole Brazilian market.

The volume of Solar Collectors Production totaled 1.3 million m<sup>2</sup>, with a year after year decline of 6.95% for solar collectors and 12.2% for storage tanks at 2016. Behaviors by type reflected the following quantitative and percentage:



PS.: The accumulated area considered only last 25 years.

### Solar Collectors:

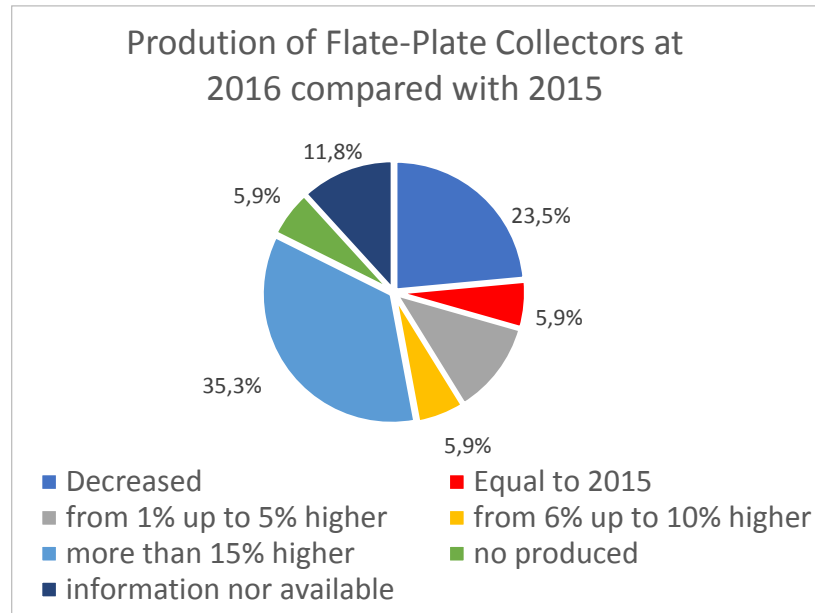
	Unglazed m <sup>2</sup>	Variation	Flate Plate m <sup>2</sup>	Variation	Evacuated Tube m <sup>2</sup>	Variation	Total m <sup>2</sup>	Variation	Accumulated Area m <sup>2</sup>	Variation
2013	621,616	18.3%	747,282	19.4%	9,909	-	1,378,807	19.8%	9,501,663	17.0%
2014	643,888	3.6%	781,118	4.5%	15,864	60.1%	1,440,870	4.5%	10,942,533	15.2%
2015	610,066	-5.3%	767,311	-1.8%	25,055	57.9%	1,402,432	-2.7%	12,344,965	12.8%
2016	548,205	-10.1%	734,240	-4.3%	22,477	-10.3%	1,304,922	-6.9%	13,649,887	10.6%

### Storage Tank:

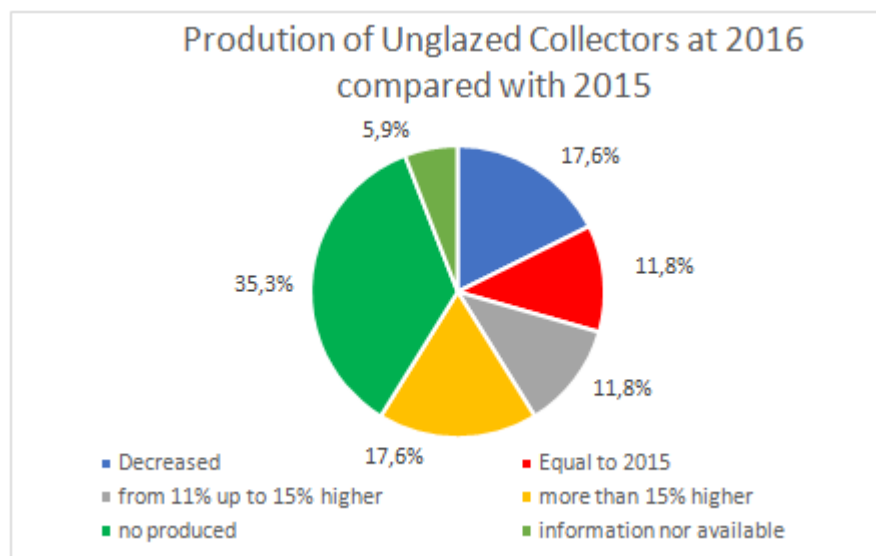
Year	Units	Percentage
2013	171,223	1,42%
2014	269,207	57,2%
2015	251,287	-6,7%
2016	220,553	-12,2%

The research identified the market behavior through the following questions:

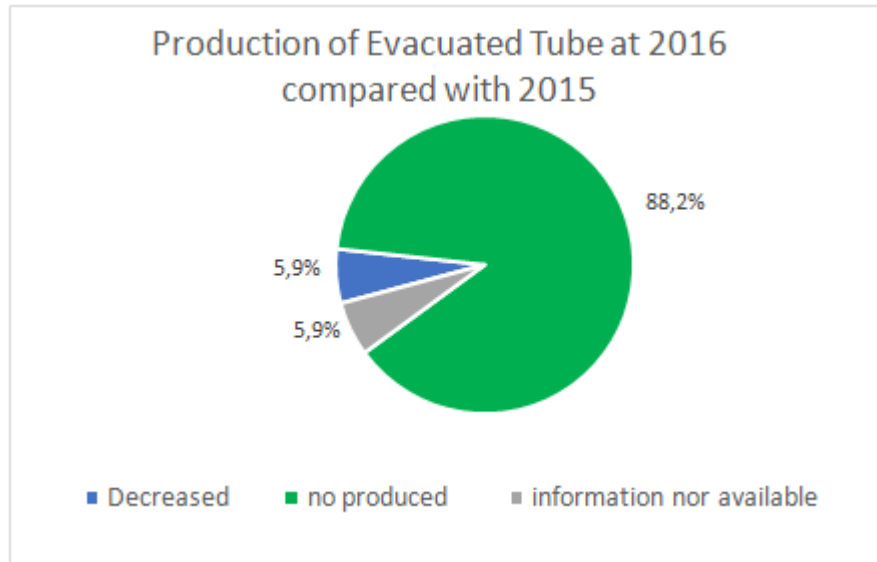
1 - What was the production behavior of flate-plate collectors in your company at 2016, compared with 2015?



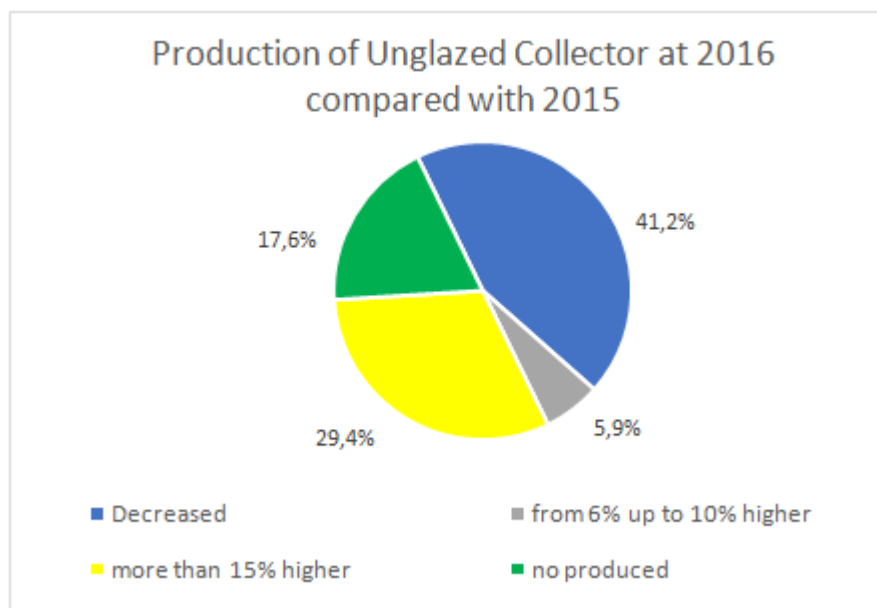
2 - What was the production behavior of unglazed collectors in your company at 2016, compared with 2015?



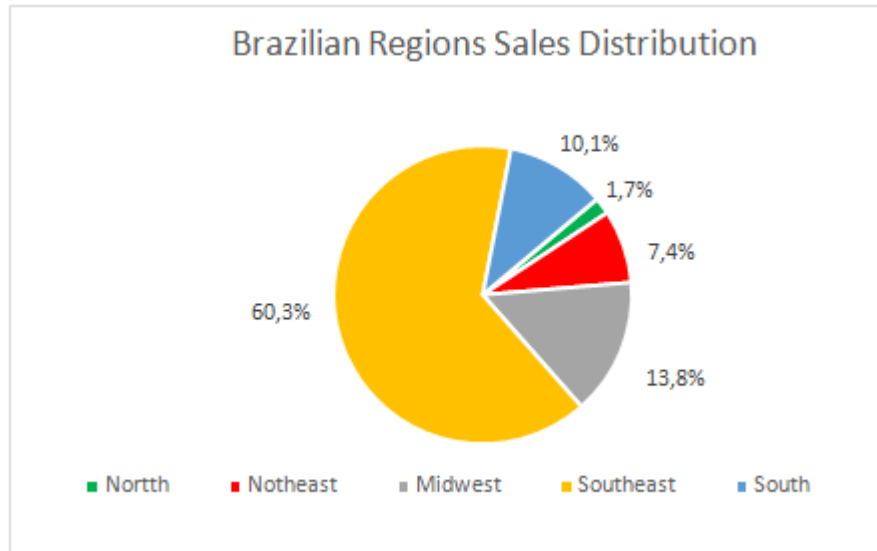
3 - What was the production behavior of evacuated tube in your company at 2016, compared with 2015?



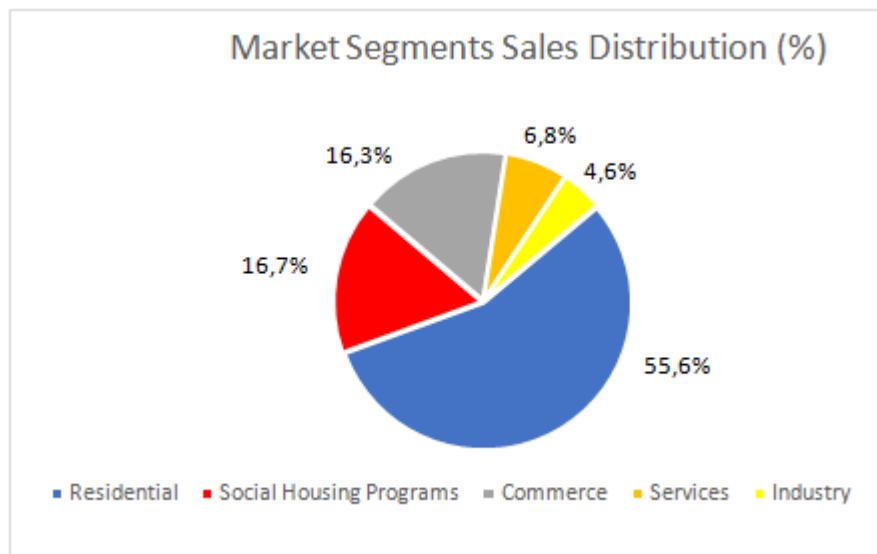
4 - What was the production behavior of storage tanks in your company at 2016, compared with 2015?



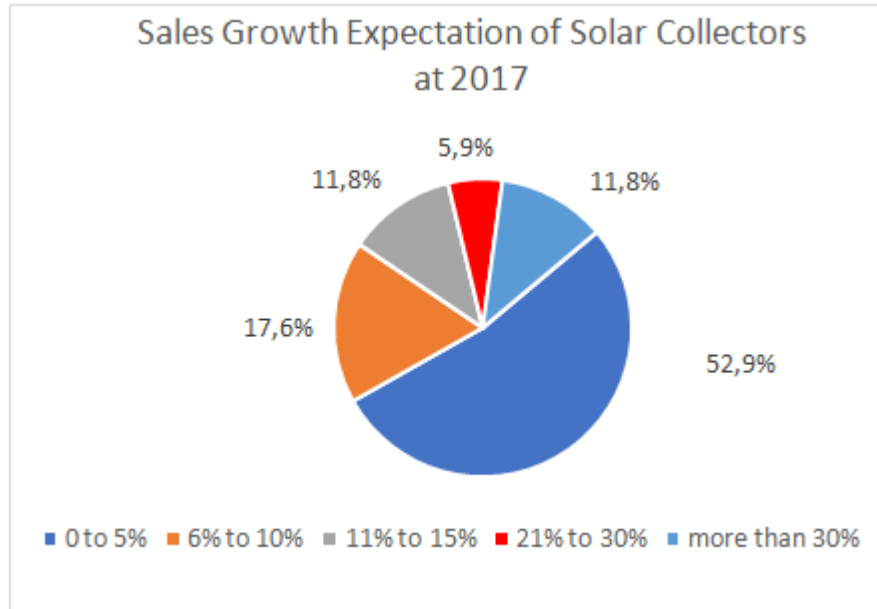
5 - How was the sales distribution (%) at your company in each Brazilian region?



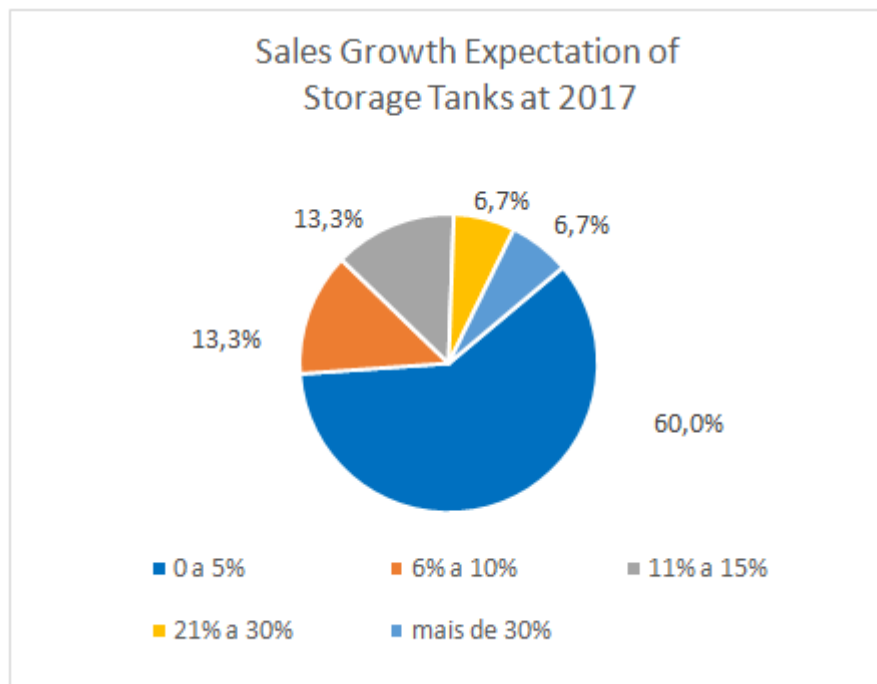
6 - How was the sales distribution (%) at your company in each market segments?



7 - What is the sales growth expectation of solar collectors (unglazed, flate –plate and evacuated tube) at 2017?



8 - What is the sales growth expectation of storage tanks at 2017?



## Comparative data between 2016 (2015 results) and 2017 (2016 results)

Regional distribution sales		
	<b>2015</b>	<b>2016</b>
North	5,93%	1,7%
Northeast	3,68%	8,0%
Midwest	13,57%	14,8%
Southeast	61,08%	64,6%
South	15,75%	10,9%
Distribution by Segments		
	<b>2015</b>	<b>2016</b>
Residential	54,0%	55,6%
Social Housing Programs	20,0%	16,7%
Commerce		16,3%
Services	20%	6,8%
Industry	6,0%	4,6%
Sales growth expectation of solar collectors		
	<b>2015</b>	<b>2016</b>
up to 5%	14,0%	52,9%
from 6% up to 10%	21,0%	17,6%
from 11% up to 15%	14,0%	11,8%
from 16% up to 20%	36,0%	-
from 21% up to 30%	7,0%	5,9%
more than 30%	7,0%	11,8%
Sales growth expectation of storage tanks		
	<b>2015</b>	<b>2016</b>
up to 5%	21%	60,0%
from 6% up to 10%	21%	13,3%
from 11% up to 15%	14%	13,3%
from 16% up to 20%	29%	-
from 21% up to 30%	14%	6,7%
more than 30%	-	6,7%