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U.S. Solar Policy Impact Analysis:

Economic Impact of Extension of the Treasury Grant Program (TGP) and Inclusion of Solar Manufacturing Equipment in the Investment Tax Credit (MITC)

EuPD Research – Exclusive Research Services

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Prepared for the Solar Energy Industries Association

Agenda

Background

In 2009, the American Recovery and Reinvestment Act created two programs that have helped the solar industry create U.S. jobs and deploy technologies: (1) a cash grant to be used in lieu of tax credits for renewable energy projects (TGP); and (2) tax credits for renewable energy manufacturing investments (MITC). Although the U.S. unemployment level remains high, the TGP is set to expire in December 2010 and the MITC funding allocation has been completely exhausted.

This study analyzes the economic impact in the U.S. of extending the TGP by two years through 2012 and allowing solar manufacturing expenditures to be claimed under the current Section 48 30% investment tax credit as a new MITC. The study examines the impact of these policies on job creation and solar electric technology deployment in the period 2010-2016.

Executive Summary

Executive Summary

A two year extension of the treasury grant program (TGP) and allowance of a solar manufacturing tax credit within the current section 48 investment tax credit (MITC) would have a large additional investment and employment effect across the U.S.
The U.S. solar electric (PV and CSP) market has experienced significant growth in the last few years and is poised to continue to grow in the next five years according to our baseline forecast.

TGP Extension Only

An extension of TGP from the current expiration date of December 31, 2010 to include projects with a "commence construction" date of December 31, 2012 would have strong effect on almost all CSP and many PV installations.

- Cumulative U.S. investment (2010-2016) in solar electric technologies would increase by $21 billion.
- An additional 67,000 jobs would be generated in 2015.
- The additional cumulative installation (2010-2016) over baseline would be 5,100 megawatts (MWp).

MITC Creation Only

Section 48 MITC creation will be an important factor to improve the competitive position of U.S. CSP and PV manufacturers, reduce prices to U.S. consumers and spur additional demand.

- Cumulative U.S. investment (2010-2016) in solar technologies would increase by $22 billion.
- An additional 158,000 jobs would be generated in 2016.
- The additional cumulative installation (2010-2016) over baseline would be 5,600 megawatts (MWp).

Executive Summary (cont.)

Both TGP Extension and MITC Creation

Promoting both TGP extension and the MITC creation within section 48 would have the strongest impact on the economy.

- Cumulative U.S. investment (2010-2016) in solar technologies would increase by $39 billion.
- An additional 207,000 jobs would be generated in 2016.
- The additional cumulative installation (2010-2016) over baseline would be 9,800 MWp.

The PV industry will benefit the most from the MITC policy, which will make the domestic industry more competitive versus overseas competition, lower prices for U.S. consumers and developers, and make the industry more innovative.

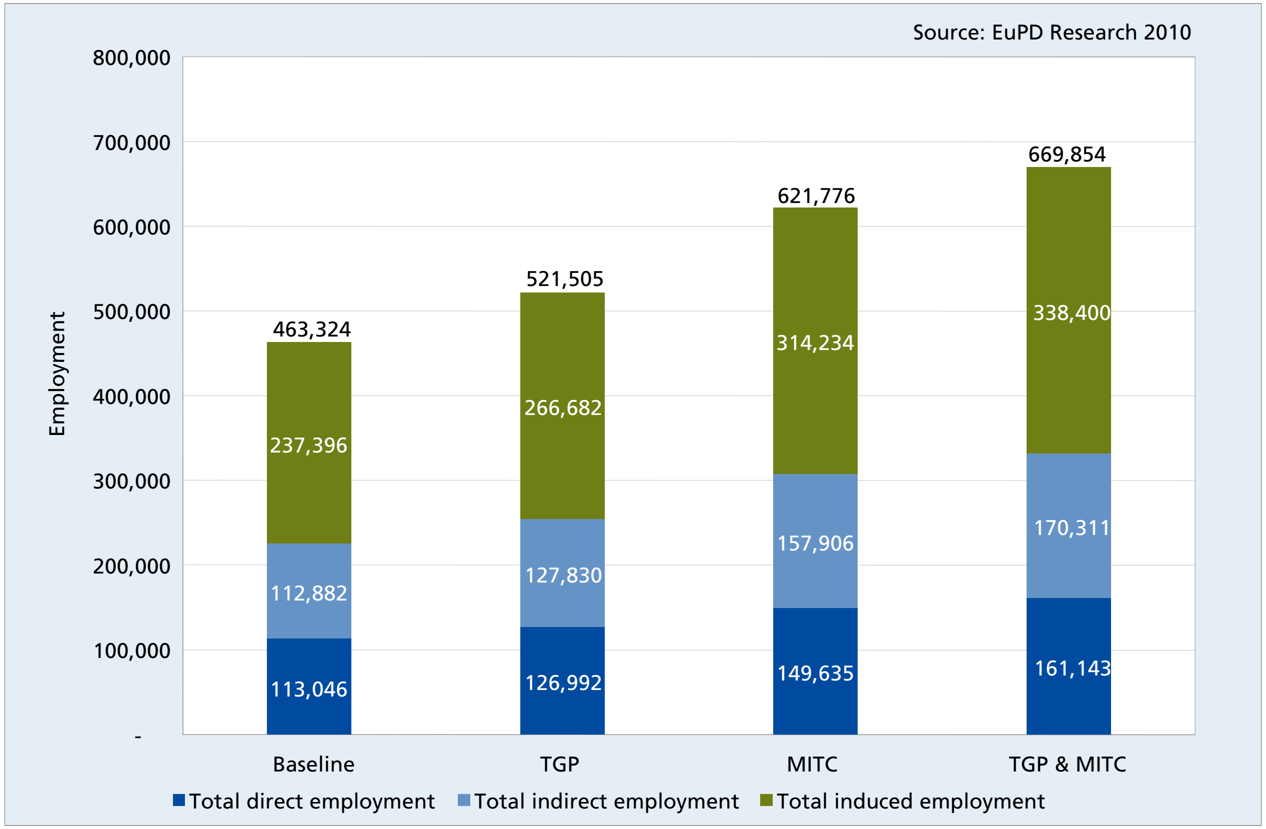
The CSP industry benefits more from the extension of the TGP "start construction" deadline because of the current time-consuming permitting and difficult financing environment.

Fiscal Benefits

There are additional costs involved for the government for both policy changes. However, when comparing 2010 and 2016 in terms of government stimulus, increased employment and the unemployment alternative we find that in five years the saved unemployment benefits and additional tax revenue are higher than the government stimulus for all three scenarios. The net savings to the government through 2016 is expected to be $0.4B, $2.1B and $2.5B, for the TGP, MITC and TGP & MITC modifications, respectively. Therefore, the analyzed policy modifications in solar electric stimulus would be an attractive investment for the U.S. government.

Employment by scenario in 2016

Expected direct and indirect U.S. solar jobs as well as induced jobs in 2016



- The baseline scenario is expected to generate a total of 463,000 jobs in 2016 including 113,000 direct solar jobs.
- If the TGP is extended, these numbers will grow to 521,500 and 127,000, respectively.
- The MITC modification alone will result in a U.S. employment of 622,000 in 2016.
- The modification of both programs will push the U.S. employment to 670,000 including 161,000 direct solar workers.

Background

Employment is calculated in job years for calendar year 2016. Direct employment includes solar workers in installation of PV systems, construction of CSP and PV power plants, manufacturing of PV panels and key CSP components.

A. U.S. Solar Electric

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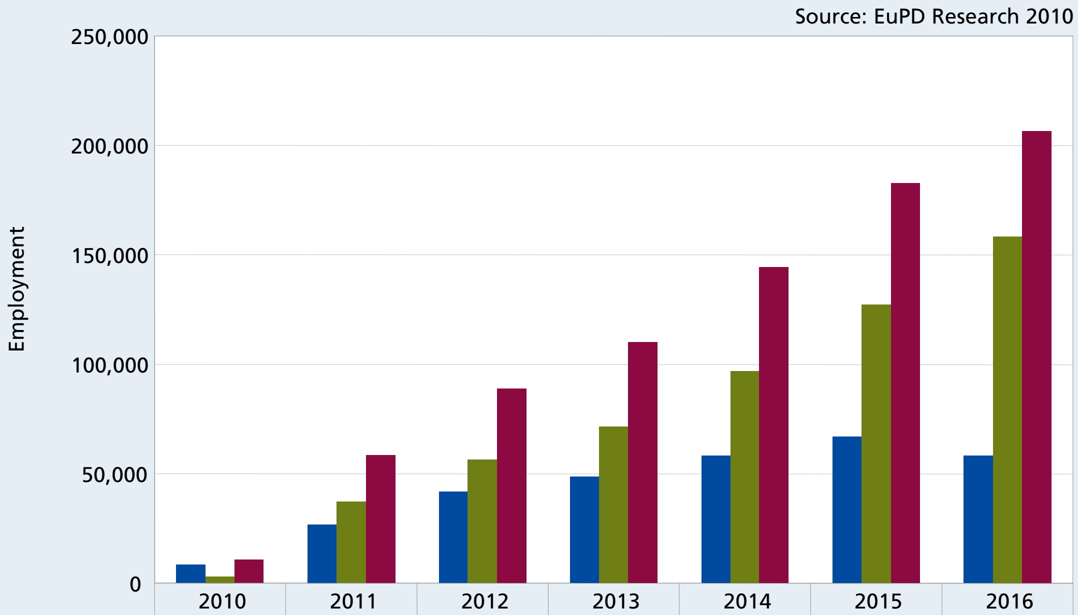
A.1. Employment by scenario

Additional (direct, indirect & induced) U.S. jobs above the baseline scenario



	2010	2011	2012	2013	2014	2015	2016
TGP	8,343	26,812	41,766	48,564	58,266	66,966	58,181
MITC	3,090	37,243	56,323	71,509	96,848	127,143	158,452
TGP & MITC	10,662	58,553	88,978	110,187	144,417	182,672	206,530

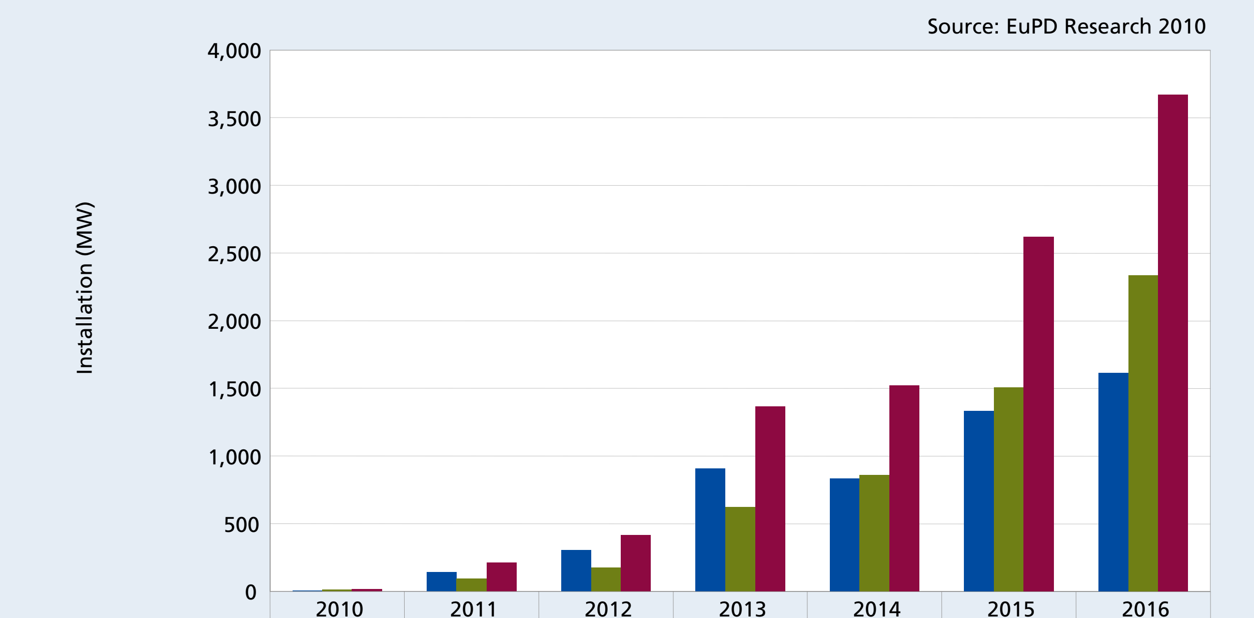
- Allowing manufacturing investments to be claimed under the section 48 credit will have a strong positive impact on the U.S. solar electric employment in the U.S., with an additional 158,000 jobs created in 2016.
- The impact of the TGP will be smaller in comparison on U.S. employment.
- Both policies together will add more than 206,000 new jobs more than the baseline scenario.

Background

The baseline scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline. The TGP scenario assumes that the treasury grant program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the MITC scenario assumes that the solar manufacturing tax credit will be uncapped in place through 2016. The TGP & MITC scenario assumes that both policy changes will be made.

A.2. Installation by scenario

Additional Installations for CSP and PV systems in the U.S. above the baseline scenario



	2010	2011	2012	2013	2014	2015	2016
TGP	5	138	305	907	835	1,333	1,611
MITC	11	95	175	623	858	1,505	2,335
TGP & MITC	16	212	413	1,365	1,519	2,618	3,669

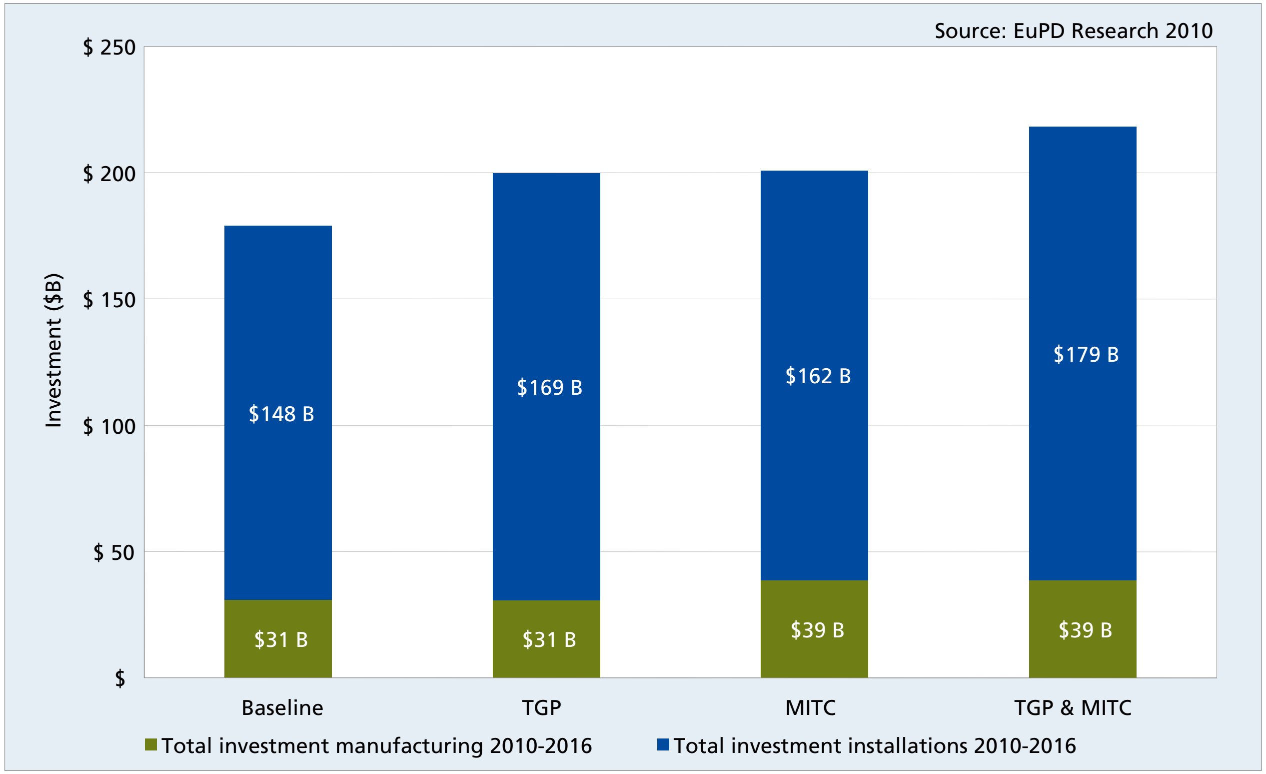
- The TGP extension will result in an additional installation of 1,600 MW in 2016 and 5,100 MW of cumulative additions from 2010-2016.
- The MITC modification will top that result with additional installations of 2,300 MW in 2016 and 5,600 MW of cumulative additions from 2010-2016.
- The impact of both policy changes together will achieve an additional 3,700 MW in installations in 2016 and 9,800 MW of cumulative additions from 2010-2016.

Background

The baseline scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline. The TGP scenario assumes that the treasury grant program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the MITC scenario assumes that the solar manufacturing tax credit will be uncapped in place through 2016. The TGP & MITC scenario assumes that both policy changes will be made.

A.3. Investment by scenario

Cumulative 2010-2016 Investment



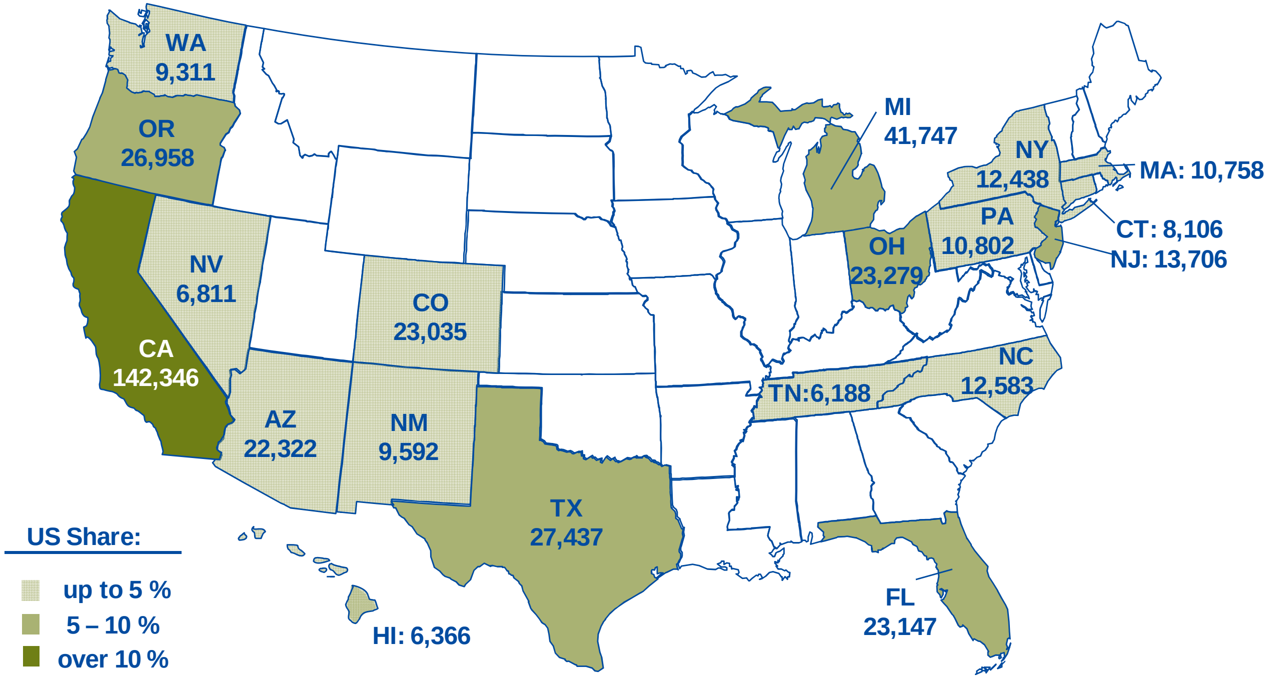
- The U.S. investment in the solar electric market is substantial. For all scenarios the installation investment is about four times as large as the manufacturing investment.
- The baseline scenario is forecast to generate a U.S. investment of almost $180B. The TGP modification scenario will top this forecast and reach $200B – about the same level as the MITC modification scenario.
- TGP & MITC together will exceed the baseline by over $39B.

Background

The baseline scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline. The TGP scenario assumes that the treasury grant program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the MITC scenario assumes that the solar manufacturing tax credit will be uncapped in place through 2016. The TGP & MITC scenario assumes that both policy changes will be made.

A.4.1. U.S. solar electric employment by state

Baseline, 2016



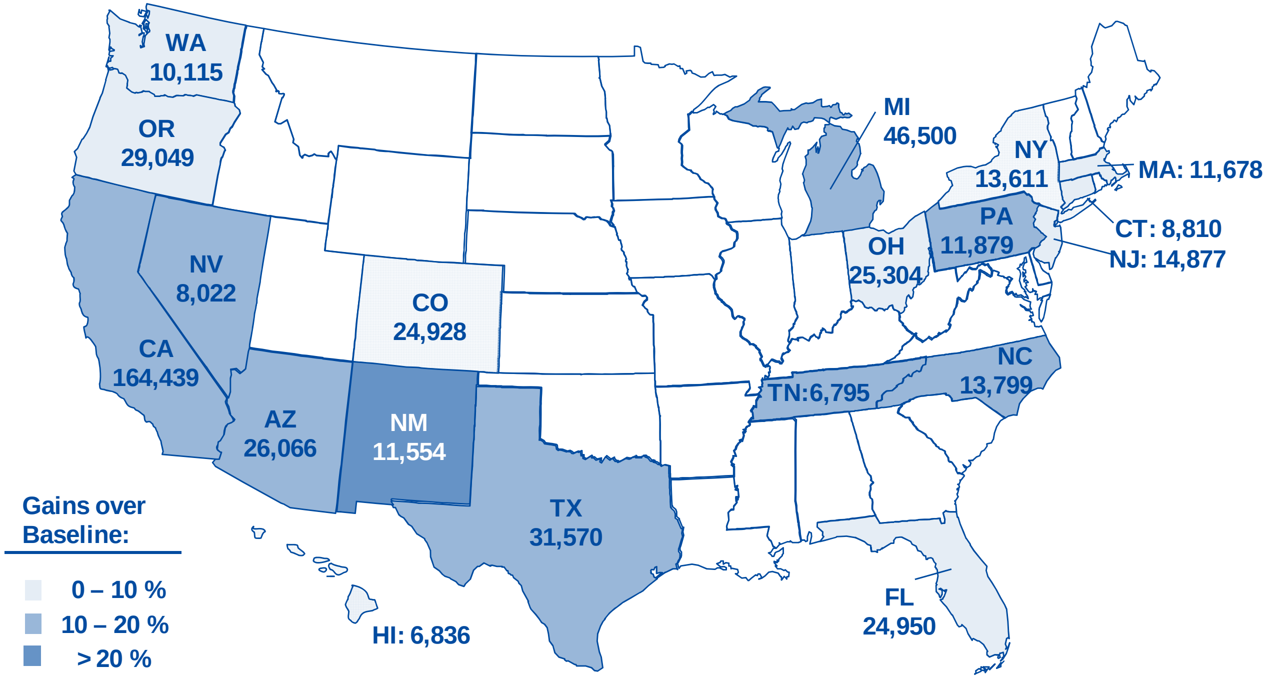
- Under the baseline scenario, California will be the employment leader – generating over 142,000 solar direct, indirect and induced jobs 2016.
- Michigan, with its strong manufacturing base, will achieve over 41,700 jobs in 2016.
- Texas will generate over 27,000 jobs in 2016.

Background

The map shows the 2016 U.S. employment level associated with the solar electric (Photovoltaic & Concentrating Solar Power) power industry. Included are direct, indirect and induced jobs in 2016. This scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline.

A.4.2. U.S. solar electric employment by state

TGP modification, 2016



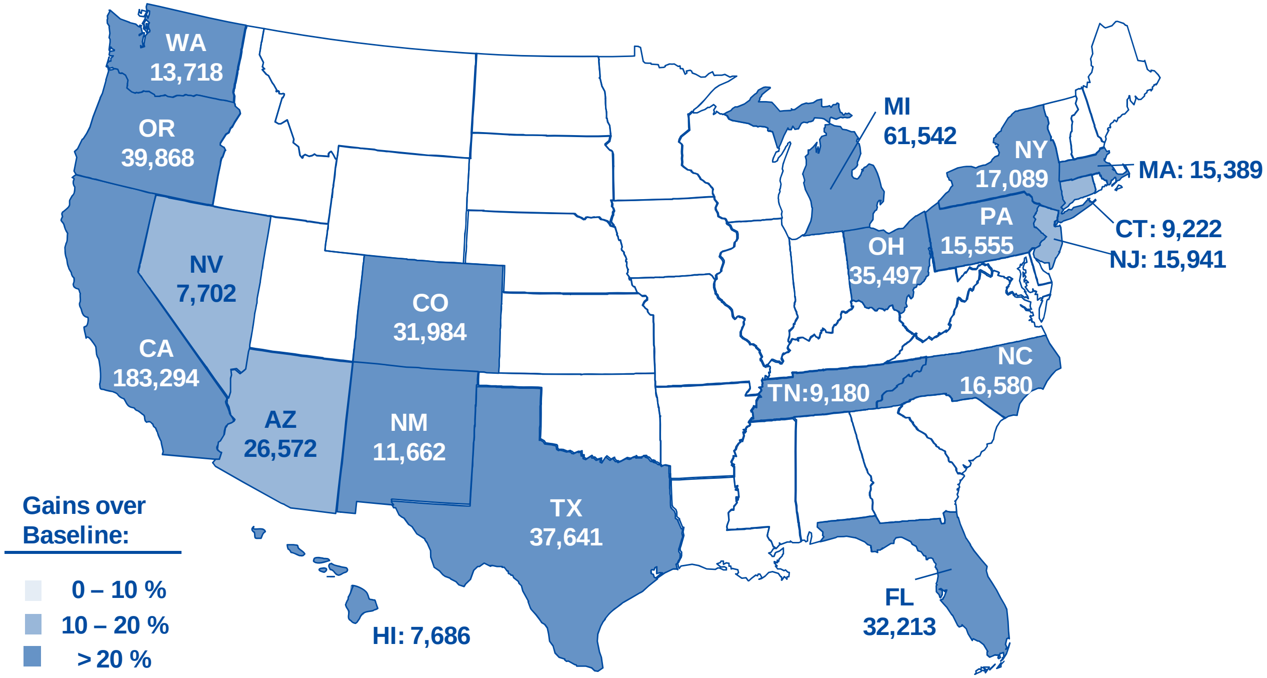
- The TGP modification will spur additional employment growth in most states.
- States that deploy CSP plants or build CSP components will benefit the most.
- The southwestern states, led by New Mexico, show the greatest percentage gain over baseline.
- California remains the leader in solar jobs.

Background

The map shows the 2016 U.S. employment level associated with the solar electric (Photovoltaic & Concentrating Solar Power) power industry. Included are direct, indirect and induced jobs in 2016. This scenario assumes that the treasury grant program program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the solar manufacturing tax credit will not be modified beyond its current funding and timeline.

A.4.3. U.S. solar electric employment by state

MITC modification, 2016



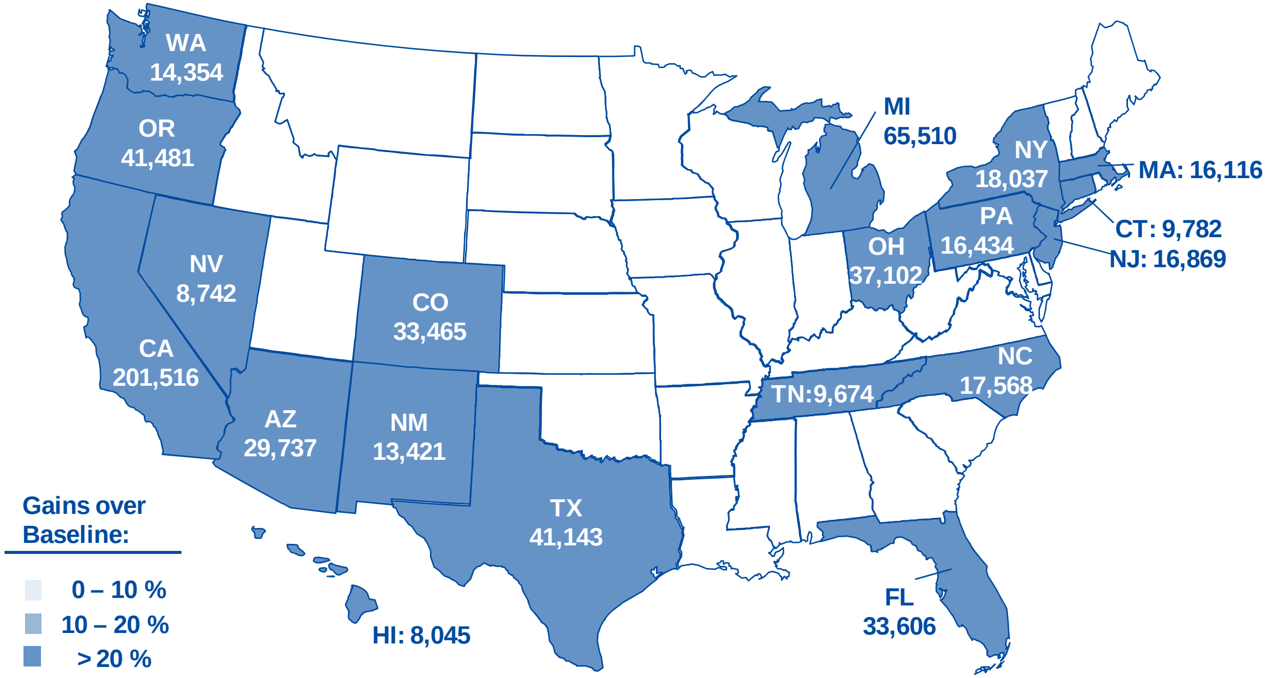
- The modification of the section 48 investment tax credit to include solar manufacturing equipment impacts most greatly states that manufacture or install PV systems.
- In this scenario California will generate over 183,000 jobs in 2016.
- Michigan will feature over 61,000 jobs in 2016.
- Significant gains will be seen in Oregon, Texas, Ohio, Florida, Colorado, Washington, New Mexico, Tennessee, New York, Pennsylvania, Massachusetts and North Carolina.

Background

The map shows the 2016 U.S. employment level associated with the solar electric (Photovoltaic & Concentrating Solar Power) power industry. Included are direct, indirect and induced jobs in 2016. This scenario assumes that the treasury grant program will conclude as currently scheduled. However, the solar manufacturing tax credit will be uncapped and in place through 2016.

A.4.4. U.S. solar electric employment by state

TGP & MITC modification, 2016



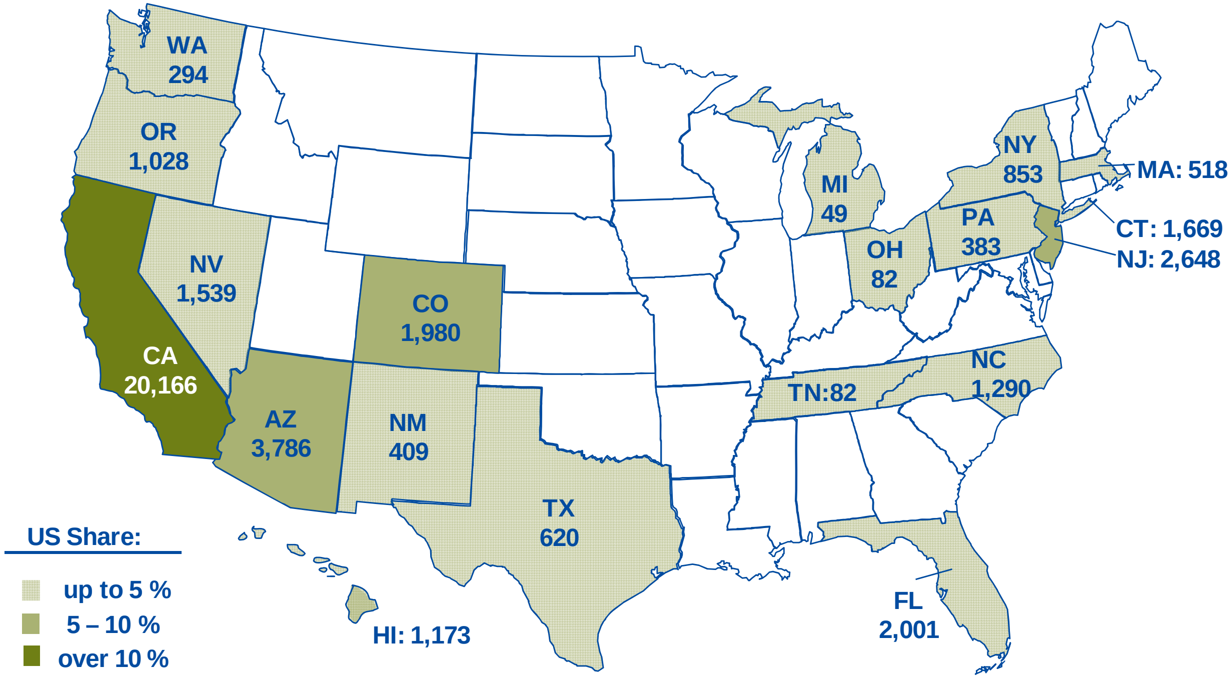
- All 19 states shown will achieve more than 20% job generation over the baseline scenario.
- California will show a tremendous level of job creation in 2016 for this scenario– surpassing 200,000 jobs.
- 16 out of 19 analyzed states will generate over 10,000 solar related jobs in 2016, with the other 3 close to that mark.

Background

The map shows the 2016 U.S. employment level associated with the solar electric (Photovoltaic & Concentrating Solar Power) power industry. Included are direct, indirect and induced jobs in 2016. This scenario assumes that the treasury grant program program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the solar manufacturing tax credit will be uncapped and in place through2016.

A.5.1. U.S. solar electric installation by state

Baseline, 2010-2016 (MWp)



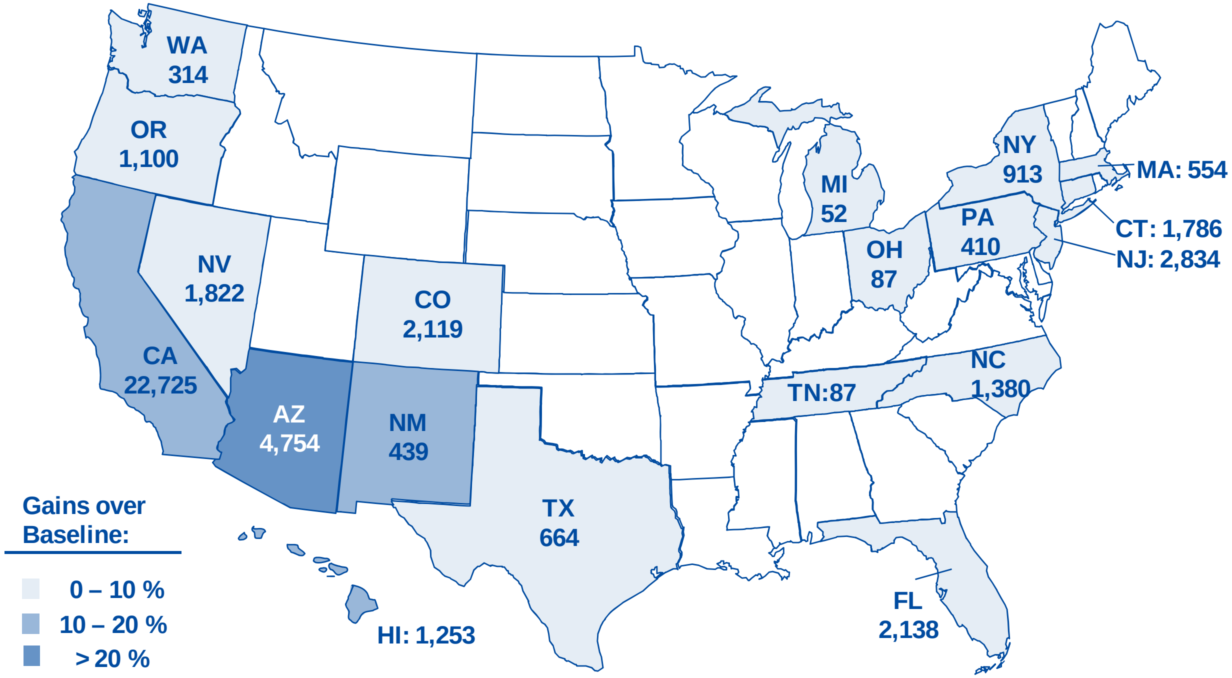
- In the baseline scenario, California will remain the dominant state with respect to solar technologies installed – reaching 20,000 MWp.
- Arizona will approach 3,800 MWp driven by the state's strong CSP adoption.
- New Jersey, Florida and Colorado also show significant growth in solar deployment.

Background

The map shows the cumulative 2010-2016 installed solar electric (Photovoltaic & Concentrating Solar Power) power capacity in megawatts (peak) (MWp). This scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline.

A.5.2. U.S. solar electric installation by state

TGP Extension, 2010-2016 (MWp)



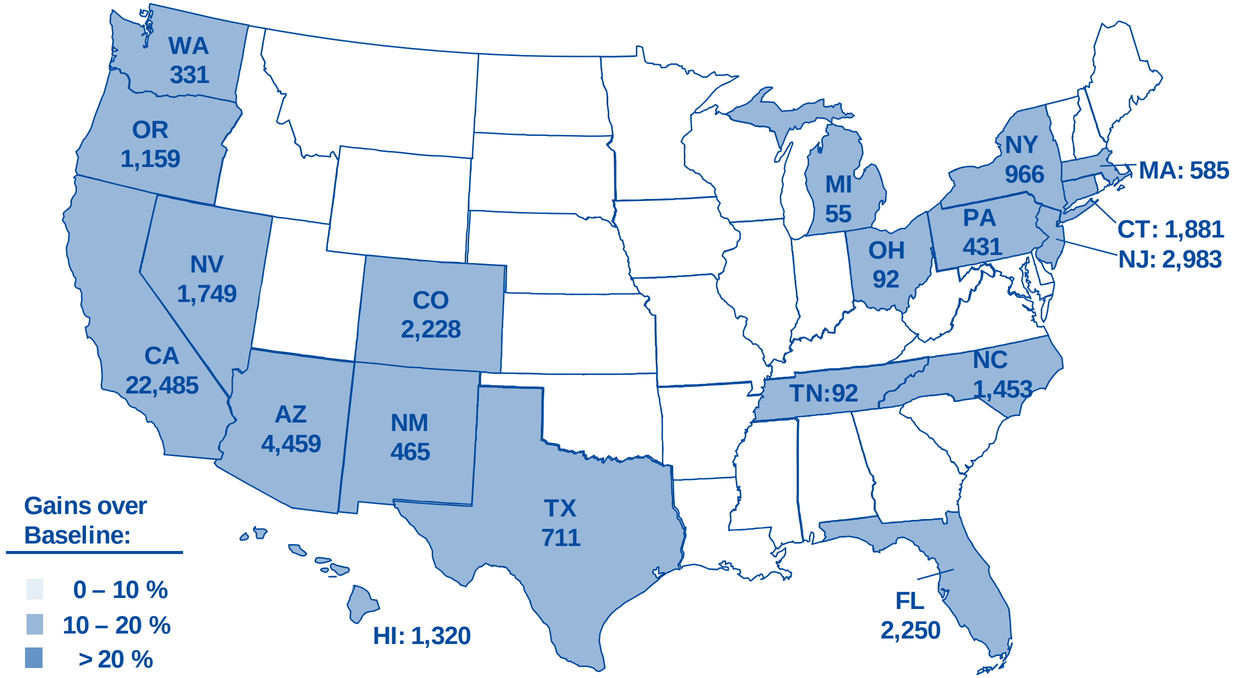
- The order of the top installation states does not change. All states have an increased outlook with a TGP extension.
- The increase is most significant for the southwestern states that have a strong CSP component in their installation mix such as Arizona, California and New Mexico.

Background

The map shows the cumulative 2010-2016 installed solar electric (Photovoltaic & Concentrating Solar Power) power capacity in megawatts (peak) (MWp). This scenario assumes that the treasury grant program program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the solar manufacturing tax credit will not be modified beyond its current funding and timeline.

A.5.3. U.S. solar electric installation by state

MITC modification, 2010-2016 (MWp)



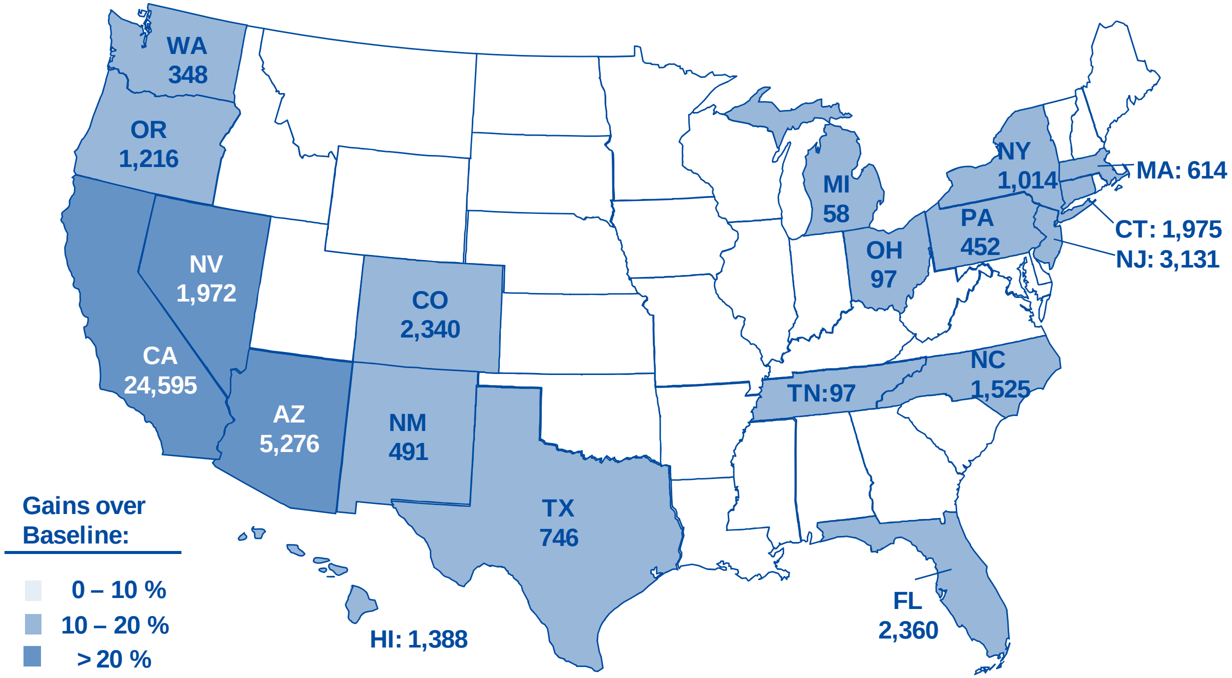
- The MITC modification also helps the installation potential in all states.
- This scenario will generate more demand in states with mainly PV installation.
- All 19 analyzed states show 10-20% growth in cumulative solar electric power installation over the baseline scenario.

Background

The map shows the cumulative 2010-2016 installed solar electric (Photovoltaic & Concentrating Solar Power) power capacity in megawatts (peak) (MWp). This scenario assumes that the treasury grant program will conclude as currently scheduled. However, the solar manufacturing tax credit will be uncapped and in place through 2016.

A.5.4. U.S. solar electric installation by state

TGP & MITC modification, 2010-2016 (MWp)



- California shows by far the most MWp installed – reaching 24,600 MWp (45% of U.S. capacity).
- Arizona will reach almost 5,300 MWp driven by the state's strong CSP adoption.
- New Jersey will reach 3,100 MWp.
- Other states that are expected to surpass the 1,000 MWp mark are Florida, Colorado, Connecticut, Nevada, North Carolina, Oregon and New York.

Background

The map shows the cumulative 2010-2016 installed solar electric (Photovoltaic & Concentrating Solar Power) power capacity in megawatts (peak) (MWp). This scenario assumes that the treasury grant program program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the solar manufacturing tax credit will be uncapped and in place through 2016.

A.6. Additional U.S. employment over baseline by state and scenario

	Additional solar electric employment by state in 2016		
	TGP Extension over baseline	MITC Modification over baseline	TGP & MITC Modification over baseline
	number	number	number
AZ	3,744	4,250	7,414
CA	22,092	40,948	59,169
CO	1,893	8,949	10,430
CT	703	1,116	1,676
FL	1,803	9,066	10,459
HI	470	1,320	1,679
MA	920	4,631	5,358
MI	4,753	19,795	23,763
NV	1,212	891	1,931
NJ	1,171	2,235	3,163
NM	1,962	2,070	3,828
NY	1,173	4,651	5,599
NC	1,217	3,997	4,986
OH	2,025	12,218	13,823
OR	2,092	12,911	14,523
PA	1,077	4,752	5,632
TN	607	2,992	3,486
TX	4,133	10,204	13,707
WA	804	4,406	5,043
Other	4,331	7,050	10,863
Total	58,181	158,452	206,530
Growth over Baseline	13%	34%	45%

- All top 19 states will benefit from the TGP extension, the new MITC creation, and the combination of both policies in terms of jobs in 2016.
- States that benefit the most, on a percentage basis, from the MITC modification are Ohio, Oregon, Tennessee and Washington.

Background

The table shows the 2016 U.S. employment level associated with the solar electric (Photovoltaic & Concentrating Solar Power) power industry for the leading U.S. states. Included are direct, indirect and induced jobs in 2016 that are in addition to the baseline forecast.

A.7. Additional U.S. installation over baseline by state and scenario

	Additional solar electric installation by state 2010-2016		
	TGP Extension over baseline	MITC Modification over baseline	TGP & MITC Modification over baseline
	MWp	MWp	MWp
AZ	968	673	1,490
CA	2,559	2,320	4,430
CO	140	248	360
CT	117	212	306
FL	137	250	359
HI	81	148	213
MA	36	67	96
MI	3	6	9
NV	283	210	433
NJ	186	334	483
NM	31	56	82
NY	60	113	161
NC	90	164	236
OH	6	10	15
OR	72	130	188
PA	27	48	69
TN	6	10	15
TX	43	90	126
WA	21	37	54
Other	267	485	698
Total	5,132	5,612	9,822
Growth over Baseline	12%	13%	22%

- All 19 analyzed states will significantly increase solar electric capacity with the TGP modification, the new MITC and the combination of both policies.
- States that grow the most with the TGP extension are the southwestern states of Arizona, California and Nevada.
- The growth from the MITC modification is fairly evenly distributed between all 19 analyzed states.

Background

The map shows the cumulative 2010-2016 installed solar electric (Photovoltaic & Concentrating Solar Power) power capacity in megawatts (peak) (MWp) in addition to the baseline forecast.

A.8. Cost of job creation

The ROI is attractive for government solar stimulus in the solar electric industry

- Even in the baseline scenario, the U.S. government invests a significant amount in the solar electric industry and the employment the industry generates.

- However, there would be a net savings to the government between 2010 and 2016, because the public cost of these policies is more than offset by the avoided unemployment costs to the government and additional income tax revenue generated by new jobs.

- In the years 2015 and 2016 the return for the government will be especially large, compensating for a less attractive ROI in earlier years in some scenarios.

- When comparing 2010 and 2016 in terms of government stimulus, increased employment and the unemployment alternative we find that in five years, the saved unemployment benefits and additional tax revenue are higher than the government stimulus for all three scenarios. The return on stimulus investment is forecast to reach $0.4B, $2.1B and $2.5B, for the TGP, MITC and TGP & MITC modification, respectively.

- Overall, this makes solar electric stimulus an attractive investment for the U.S. government.

Background

The main cost factors for the U.S. Government are the 30% investment tax credit, the 30% TGP as an alternative, as well as the 30% MITC that is currently capped at $2.3B. The return on this government investment is tax the reemployed solar worker (direct, indirect and induced) pay to the government and the unemployment benefits that that would otherwise be required to support unemployed workers (direct, indirect and induced).

B. Photovoltaics

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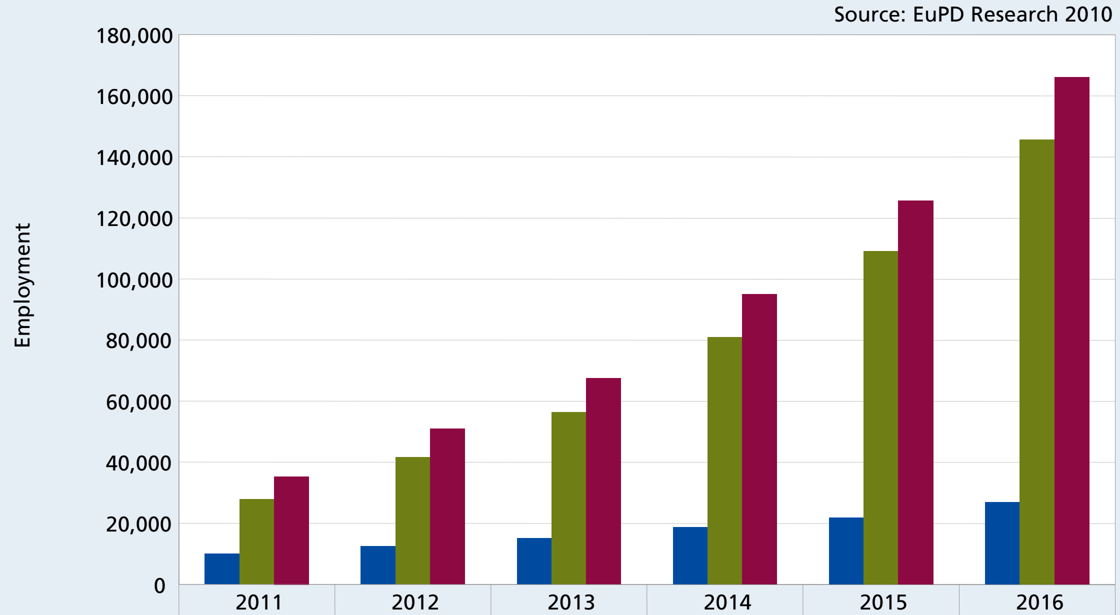
B.1. Photovoltaic employment by scenario over baseline 2010-2016

Additional U.S. (direct, indirect & induced) photovoltaic jobs in 2016 above the baseline scenario



	2011	2012	2013	2014	2015	2016
TGP	10,043	12,454	15,145	18,654	21,878	26,813
MITC	27,949	41,673	56,263	80,847	109,104	145,685
TGP & MITC	35,335	50,922	67,603	94,903	125,679	166,054

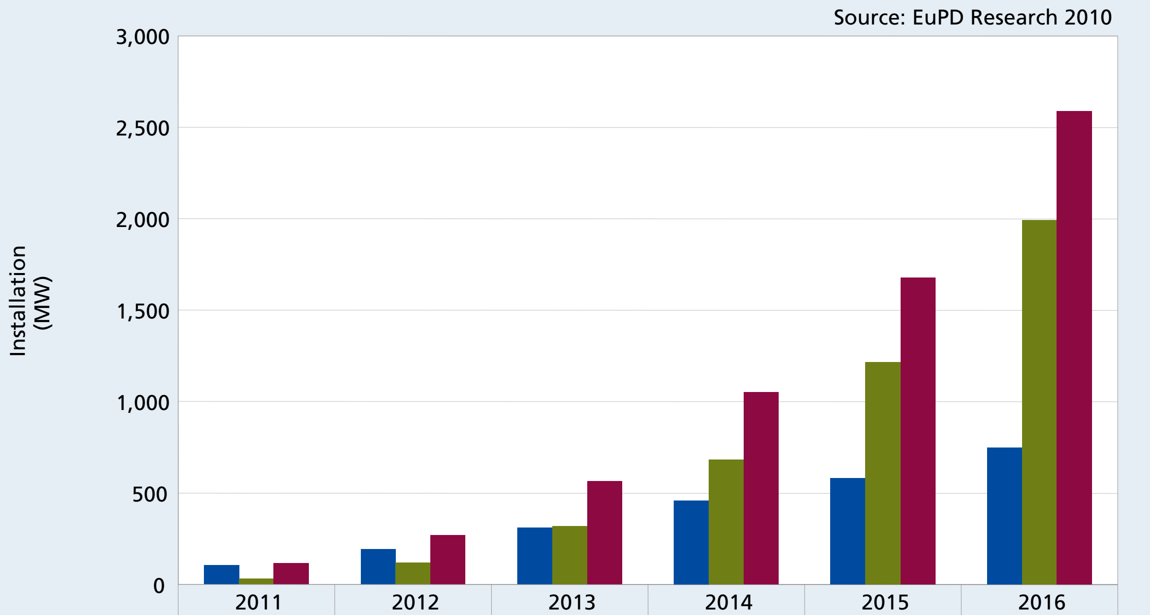
- This graph shows data for photovoltaics (PV) only.
- Creation of a new section 48 MITC will have a strong positive impact on employment in the U.S., with an additional 145,000 jobs created in 2016.
- The impact of the TGP will be smaller in comparison on U.S. employment.
- Both programs together will add 166,000 jobs more than the baseline scenario.

Background

The employment data for all scenarios includes all direct, indirect and induced jobs.

B.2. Photovoltaic installations by scenario over baseline

Additional U.S. PV installations above the baseline scenario



	2011	2012	2013	2014	2015	2016
TGP	106	190	309	459	581	747
MITC	30	118	317	682	1,213	1,991
TGP & MITC	115	270	564	1,049	1,678	2,589

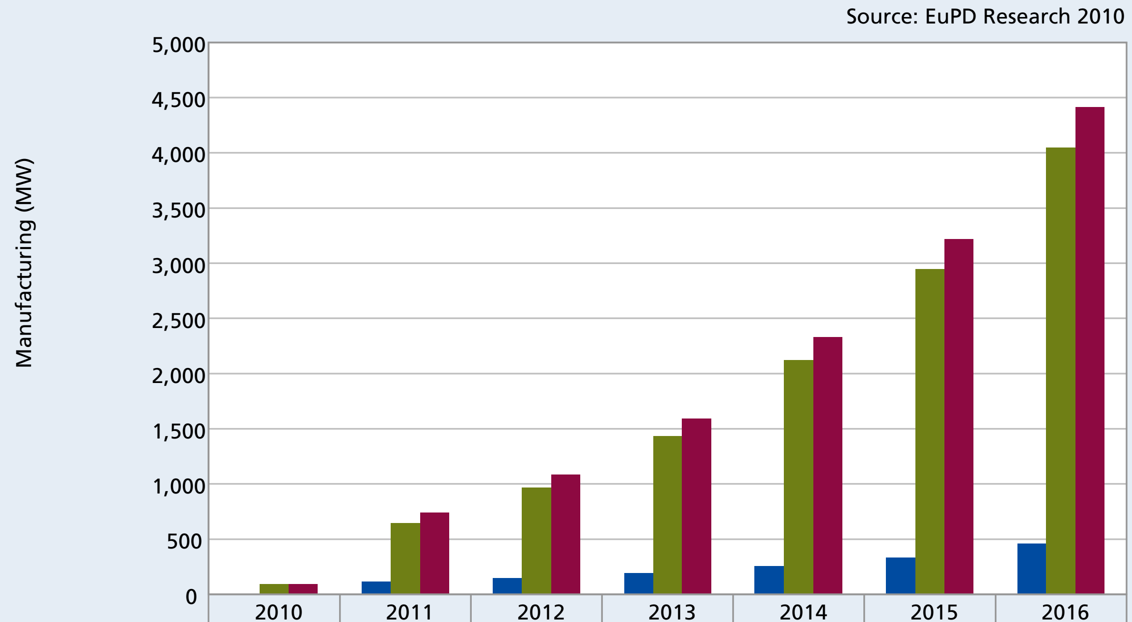
- This slide looks at photovoltaics (PV) only.
- Analysis shows significant growth in installation for the TGP.
- However, new MITC creation will have a larger impact, resulting in an additional installation of 2,000 MW of PV in 2016.
- Together, the TGP and MITC policies will cause PV growth of 2,600 MW in 2016.
- Cumulatively (2010-2016), TGP extension will result in 2,400 MW of additional installations, new MITC will yield over 4,300 MW of additional installations, and both policies will deploy over 6,200 MW of new solar capacity.

Background

The MITC will have a stronger impact on additional growth than TGP for several reasons, including that the MITC has a longer impact duration through ongoing effects on the cost of manufacturing equipment.

B.3. PV manufacturing by scenario over baseline 2010-2016

U.S. PV manufacturing output above the baseline scenario



	2010	2011	2012	2013	2014	2015	2016
TGP Extension	-	116	147	195	258	338	460
MITC Modification	94	647	968	1,435	2,125	2,948	4,046
TGP & MITC Modification	94	740	1,086	1,591	2,332	3,219	4,414

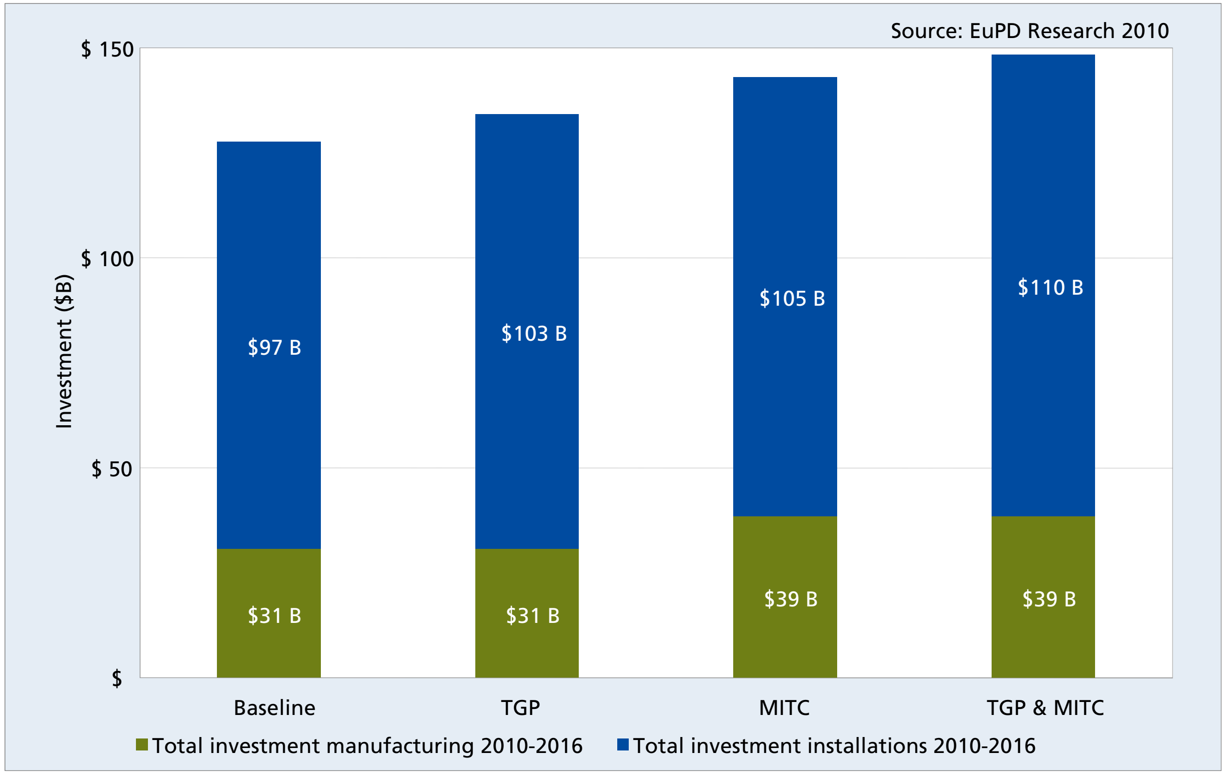
- This slide looks at photovoltaics (PV) only.
- The creation of a new MITC will have an dramatic impact on PV production in the U.S.
- More than 4,000 MW will be manufactured in 2016 above the baseline scenario.
- The impact of the TGP will be relatively small on U.S. manufacturing.
- Some additional demand will lead to some additional manufacturing output for U.S. PV factories.

Background

The baseline scenario assumes no modification of the TGP and no additional funds for MITC beyond the already committed $2.3B will become available. More detail about the baseline forecast is in Appendix 1.

B.4. PV Investment by scenario

Cumulative 2010-2016 Investment



- The U.S. investment in the PV market is substantial. For all scenarios, the installation investment is about three times as large as the manufacturing investment.
- The baseline scenario is forecast to generate a U.S. investment of $128B. The TGP modification scenario will top this forecast by $6.6B.
- The MITC modification scenario will attract over $15B more than the baseline scenario.
- TGP & MITC together will exceed the baseline by over $20B.

Background

Investment has two components, installation investment and manufacturing investment. Installation investment is the cost paid by the PV end-user for an installed PV system that generates electricity. Manufacturing investment is the capital cost paid by PV manufacturers to expand capacity, improve the manufacturing process or adopt new technologies.

B.5. Cost of job creation by scenario

The ROI is attractive for government solar stimulus in the PV industry

- Even in the baseline scenario, the U.S. government invests a significant amount in the solar industry and the employment the industry generates. This is about $10,000 to $20,000 per new PV job depending on the year.

- The good news is that this expense is offset by additional tax revenues and unemployment benefits savings per worker that are significantly higher in almost all years and scenarios.

- In the years 2015 and 2016 the return for the government will be especially large compensating for a less attractive ROI in earlier years in some scenarios.

- When comparing 2010 and 2016 in terms of government stimulus, increased employment and the unemployment alternative we find that in five years the saved unemployment benefits and additional tax revenue are higher than the government stimulus for all three scenarios. The return on stimulus investment is forecast to reach $0.5B, $2.3B and $2.4B, for the TGP, MITC and TGP & MITC policy implementation, respectively.

- Overall, this makes each of the examined policies a fiscally attractive investment for the U.S. government.

Background

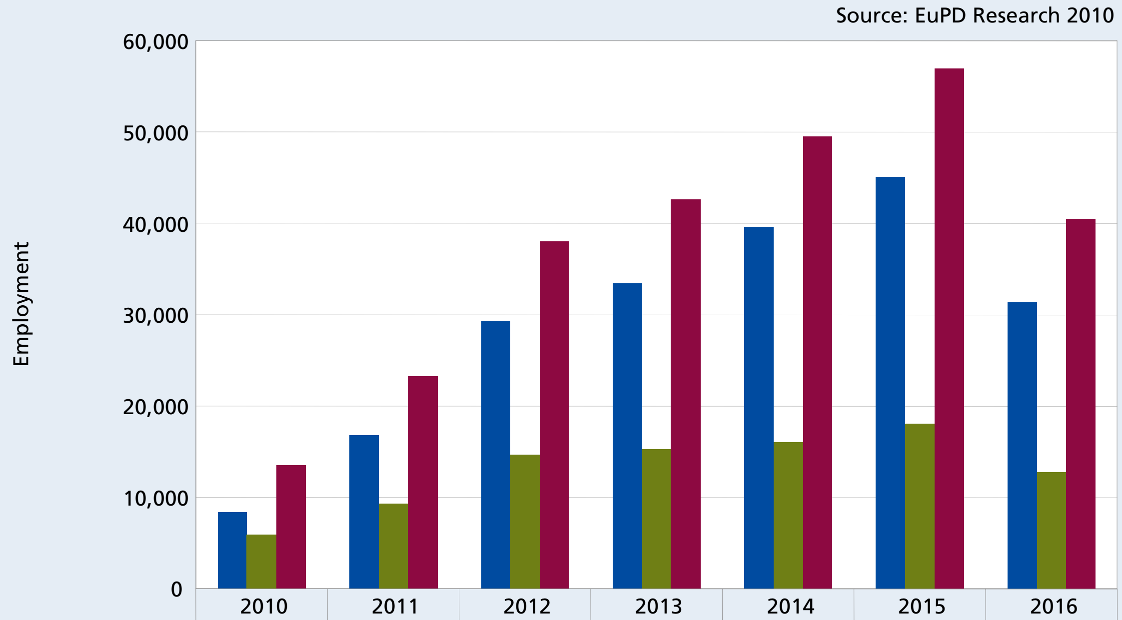
The main cost factors for the U.S. Government are the 30% investment tax credit, the 30% TGP as an alternative, as well as the 30% MITC that is currently capped at $2.3B. The return on this government investment is tax the reemployed solar worker (direct, indirect and induced) pay to the government and the unemployment benefits that would otherwise be required to support unemployed workers (direct, indirect and induced).

C. Concentrating Solar Power

Contents

C.1. CSP employment by scenario

Additional U.S. (direct, indirect & induced) U.S. jobs in 2016 above the baseline scenario



	2010	2011	2012	2013	2014	2015	2016
TGP	8,343	16,769	29,312	33,420	39,612	45,088	31,368
MITC	5,909	9,294	14,651	15,245	16,002	18,039	12,767
TGP & MITC	13,481	23,219	38,056	42,584	49,515	56,993	40,476

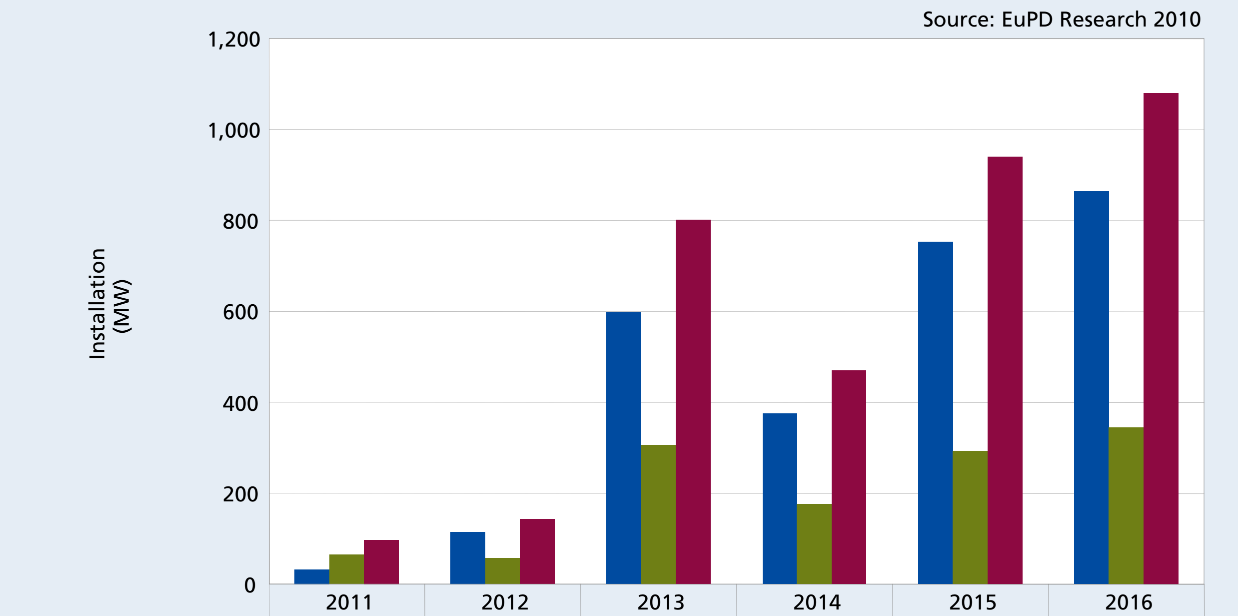
- This slide shows concentrating solar power (CSP) only.
- Continued funding of the TGP will have an strong positive impact on CSP related employment in the U.S.
- An additional 45,000 jobs will be created in 2015.
- The impact of the MITC will be smaller in comparison on U.S. employment.
- Both programs together will add 56,000 jobs more than the baseline scenario in 2015.

Background

The employment data for all scenarios includes all direct, indirect and induced jobs.

C.2. CSP installation by scenario

Additional U.S. installations above the baseline scenario



	2011	2012	2013	2014	2015	2016
TGP	32	115	597	376	752	864
MITC	65	57	306	176	292	344
TGP & MITC	97	144	801	470	940	1,080

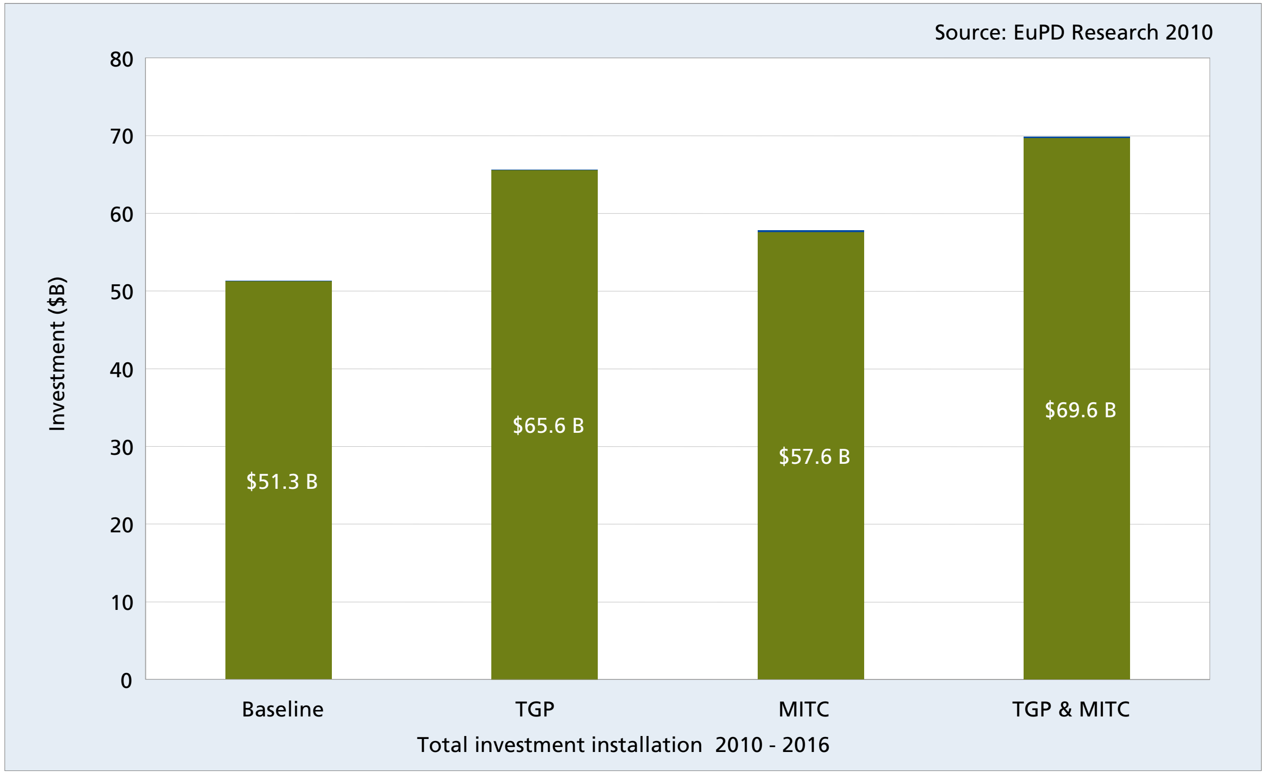
- This slide shows concentrating solar power (CSP) only.
- CSP shows significant growth in installations under the TGP as well as the MITC modification.
- These two policies together will add 1,000 MW of additional CSP in 2016 alone.

Background

The TGP modification will be more important for the CSP industry. Grants are much easier financing tools for power plants than the tax credits.

C.3. CSP investment by scenario

Cumulative 2010-2016 Investment in the U.S.



- This slide shows concentrating solar power (CSP) only.
- The U.S. investment in the CSP market is substantial.
- The baseline scenario is forecast to generate a U.S. investment of $51B. The TGP modification scenario will top this forecast by $14B.
- The MITC policy scenario will attract over $6.5B more than the baseline scenario.
- TGP & MITC policies together will exceed the baseline by over $18.5B.

Background

Investment has two components, installation investment and manufacturing investment. Installation investment is the cost paid by the CSP end-user for an installed CSP system that generates electricity. Manufacturing investment is the capital cost paid by CSP manufacturers to expand capacity, improve the manufacturing process or adopt new technologies. These policies will have nearly an exclusive impact on installation investment because most of the value of a CSP plant is created at the installation and construction.

C.4. Cost of job creation by scenario

The ROI is attractive for government solar stimulus in the CSP industry

- Even in the baseline scenario, the U.S. government invests a significant amount in the solar industry and the employment the industry generates. This is about $20,000 per solar job. The good news is that this expense is offset by additional tax revenues and unemployment benefits savings.

- When comparing 2010 and 2015, the CSP peak year in the forecast period, in terms of government stimulus, increased employment and the unemployment alternative we find that in four years the saved unemployment benefits and additional tax revenue are higher than the government stimulus for the TGP & MITC modification scenario by $0.6B. The numbers for 2014 and 2016 are also positive but by a smaller amount.

- The return on investment is smaller when only the TGP or only the MITC is modified.

- This makes solar stimulus an attractive investment for the U.S. government.

Background

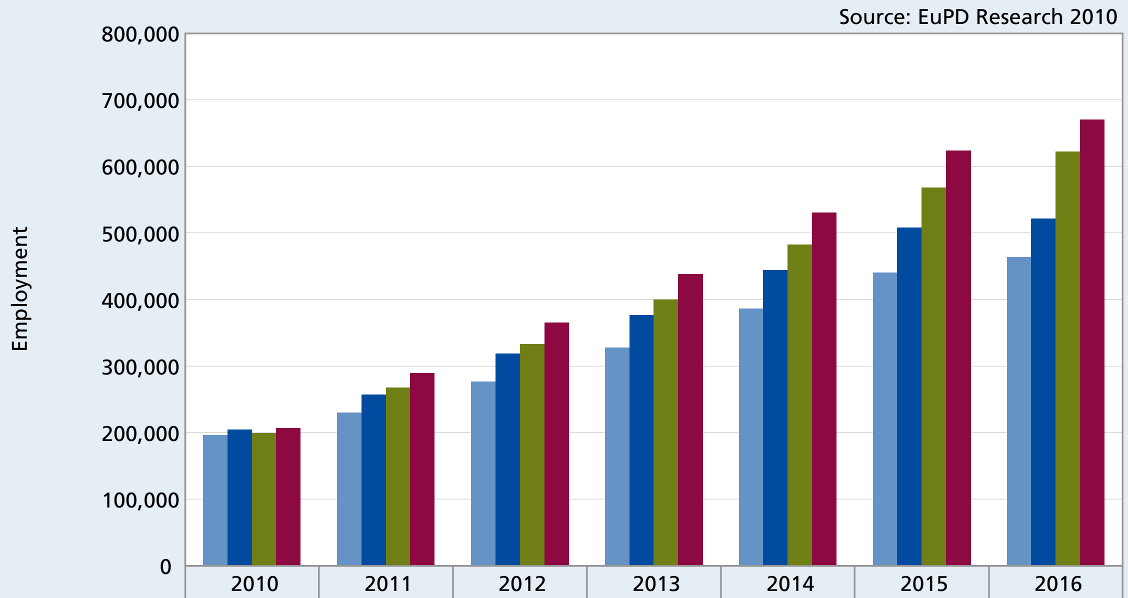
The main cost factors for the U.S. Government are the 30% investment tax credit, the 30% TGP as an alternative, as well as the 30% MITC that is currently capped at $2.3B. The return on this government investment is tax the reemployed solar worker (direct, indirect and induced) pay to the government and the unemployment benefits that would be required to support unemployed solar workers (direct, indirect and induced).

Appendix 1

Contents

Total employment by scenario

U.S. jobs (direct, indirect & induced) in the solar and supporting industries.



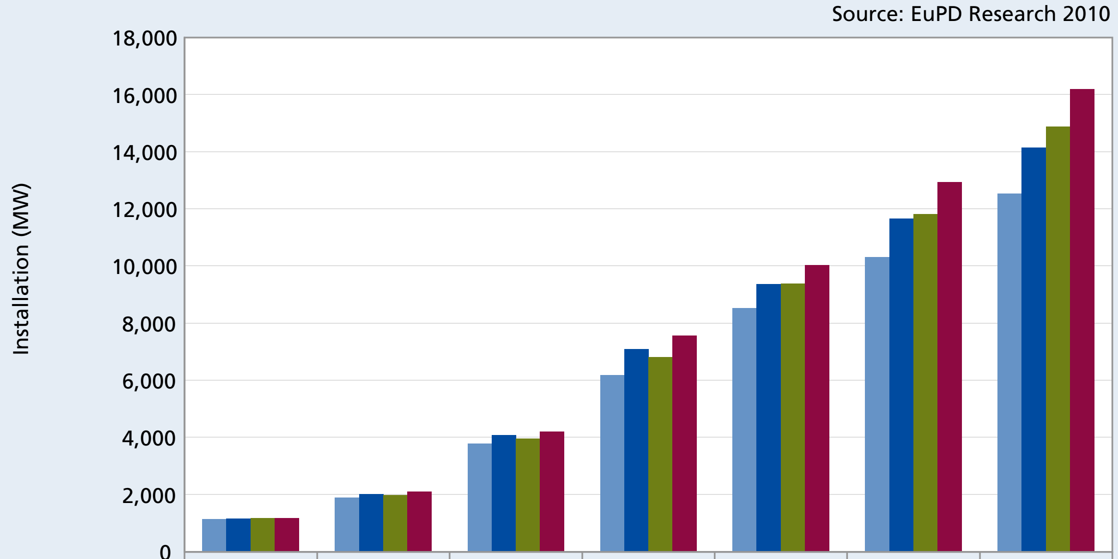
	2010	2011	2012	2013	2014	2015	2016
Baseline	196,232	230,384	276,721	327,898	386,056	440,538	463,324
TGP Extension	204,574	257,196	318,487	376,462	444,322	507,504	521,505
MITC Modification	199,321	267,627	333,044	399,407	482,904	567,681	621,776
TGP & MITC Modificat.	206,893	288,937	365,699	438,085	530,473	623,210	669,854

Background

The baseline scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline. The TGP scenario assumes that the treasury grant program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the MITC scenario assumes that the solar manufacturing tax credit will be uncapped in place through 2016. The TGP & MITC scenario assumes that both policy changes will be made.

Total Installations by scenario

U.S. installations for CSP and PV systems by the first year they produce energy



	2010	2011	2012	2013	2014	2015	2016
Baseline	1,156	1,891	3,781	6,188	8,528	10,320	12,537
TGP Extension	1,162	2,029	4,086	7,095	9,363	11,653	14,148
MITC Modification	1,167	1,986	3,956	6,811	9,386	11,825	14,872
TGP & MITC Modificat.	1,172	2,103	4,194	7,553	10,047	12,938	16,206

Background

The baseline scenario assumes that the treasury grant program will conclude as currently scheduled and the solar manufacturing tax credit will not be modified beyond its current funding and timeline. The TGP scenario assumes that the treasury grant program's "commence construction" date will be extended through 2012 with no change in the online date by the end of 2016 and the MITC scenario assumes that the solar manufacturing tax credit will be uncapped in place through 2016. The TGP & MITC scenario assumes that both policy changes will be made.

Appendix 2

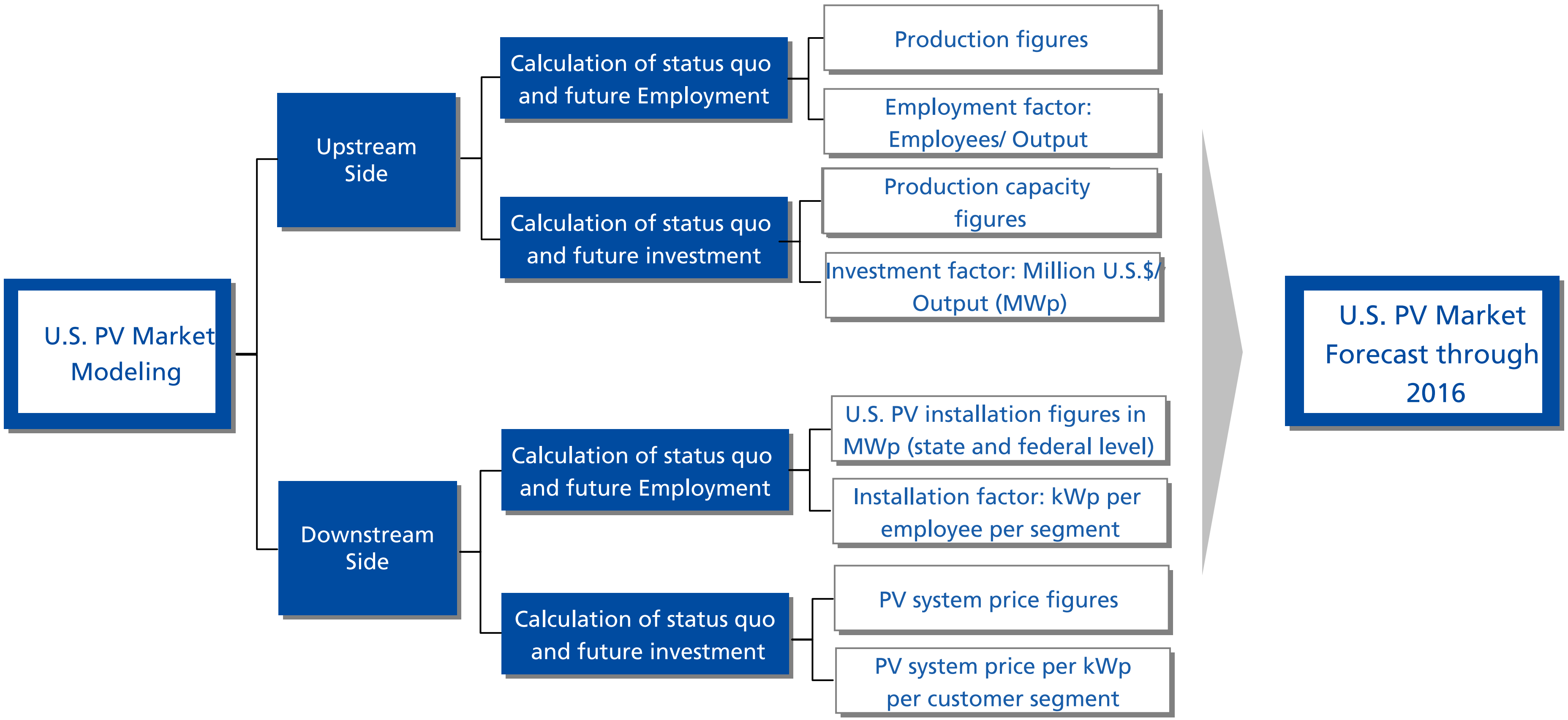
Contents

Appendix 2

Methodology

- Most of the forecast data, especially for PV, is based on research data in EuPD Research's extensive solar data base and its continuous global market research. The other data points were modeled leveraging existing market data and industry knowledge of the PV and CSP markets. EuPD Research uses a combined upstream and downstream research to forecast the baseline PV which is illustrated graphically on the next page.
- The three policy modification scenario were modeled based the substantial experience EuPD Research has in analyzing incentive policies in the US, Europe and Asia. The key modeling factors that were adjusted in EuPD Research's PV and CSP models to reflect the policy change impact were primarily: demand factor, US competitive factor, accelerated learning curve effects, labor rates and the likelihood that questionable CSP projects get completed as scheduled.
- The CSP market was analyzed on a project by project basis. NREL's JEDI models were used to calculate the investment, employment and key component cost for solar trough plants.
- The DOE list with details about the solar projects that were awarded an MITC under Sec. 48C was used as a guide to calculate the near-term manufacturing investments.
- Model output data will was crosschecked with other industry sources and expert interviews to validate key data points.

Economic Model



Appendix 2

Assumptions PV

- The baseline PV growth is driven by continued state and federal incentives that will not change significantly in the next five year beyond the changes known as of April 2010.
- The TGP will impact most of the open field PV installations and a minority of the commercial rooftop market. For these installation the TGP will result on average in a 25% cost savings over the ITC.
- The MITC will have a strong effect on the competitiveness of the U.S. PV manufacturing industry and reduce prices for U.S. consumers.
- The learning curve cost reduction will be accelerated if the policy changes that stimulate the solar market come into effect.
- The state PV incentives will be adjusted only slowly over the next five years in predictable way that allows end-users and the industry to adjust accordingly.

Appendix 2

Assumptions CSP

- The investment environment for CSP will remain favorable in the southwestern U.S. The CSP industry will maintain continued support at the state and local level.
- The TGP will impact most projects. It will be strongest for projects that have difficulties to get financed.
- The MITC will have a much smaller impact on CSP than on PV, because only a few CSP plant components are solar specific and also factories for them are not as expensive as PV factories.
- CSP demand will remain relatively steady in the years 2015-2017, beyond the current project horizon.

Editorial

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