公开版本

中华人民共和国相关乙二醇和丙二醇的单烷基醚产业申请对原产于美国的进口相关乙二醇和丙二醇的单烷基醚进行反倾销调查

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附件 1

编 号 320200666202003200018

统一社会信用代码

91320200250417423 2 (1/1)

营业执照

(副 本)

扫描二维码登录“国家企业信用信息公示系统”了解更多登记、备案、许可、监管信息。

名　　称	江苏怡达化学股份有限公司	注册资本	8057.1万元整
类　　型	股份有限公司(上市)	成立日期	1996年06月20日
法定代表人	刘准	营业期限	1996年06月20日至******
经营范围	醇醚、醇醚醋酸酯系列产品的生产（按安全生产许可证所列范围经营）；危险化学品经营（按许可证所列范围和方式经营）；醇醚、醇醚醋酸酯系列产品（不含危险化学品）的生产；机动车制动液、汽车发动机冷却液产品的生产、销售；化工产品及原料（不含危险化学品）的销售；化工产品及其生产技术的研究、开发；自营和代理各类商品及技术的进出口业务（但国家限定企业经营或禁止进出口的商品和技术除外）；售电业务。（依法须经批准的项目，经相关部门批准后方可开展经营活动）	住　　所	江阴市西石桥球庄村

登记机关 江阴市行政审批局 3202922020337

2020 年 03 月 20 日

国家企业信用信息公示系统网址：http://www.gsxt.gov.cn

市场主体应当于每年1月1日至6月30日通过国家企业信用信息公示系统报送公示年度报告。

国家市场监督管理总局监制

统一社会信用代码

91220294782607498O

营业执照

（副 本）

1-1

扫描二维码登录“国家企业信用信息公示系统”了解更多登记、备案、许可、监管信息。

名　　称　吉林怡达化工有限公司

类　　型　有限责任公司(非自然人投资或控股的法人独资)

法定代表人　刘准

经营范围　乙二醇醚系列及其醋酸酯系列产品（危险化学品仅限乙二醇甲醚、乙二醇乙醚、乙二醇丁醚、乙二醇丙醚、乙二醇乙醚醋酸酯）、丙二醇醚系列及其醋酸酯系列产品（危险化学品仅限丙二醇甲醚、丙二醇乙醚、丙二醇甲醚醋酸酯）（以上安全生产许可证有效期至2020年9月27日）生产；钛硅分子筛催化剂生产（不含危险化学品）；钢桶制造；化工产品（不含危险化学品）生产和经销。（依法须经批准的项目，经相关部门批准后方可开展经营活动）。

注册资本　壹亿伍仟叁佰捌拾万元整

成立日期　2005 年 12 月 22 日

营业期限　2005 年 12 月 22 日 至 2024 年 04 月 16 日

住　　所　吉林市吉林经济技术开发区昆仑街346号

登记机关　吉林市市场监督管理局

2019 年 04 月 18 日

国家企业信用信息公示系统网址：http://jl.gsxt.gov.cn

市场主体应当于每年1月1日至6月30日通过国家企业信用信息公示系统报送公示年度报告

国家市场监督管理总局监制

营业执照

(副 本) (副本号:1-1)

统一社会信用代码: 914404007408492967

名　　称	珠海怡达化学有限公司
商事主体类型	有限责任公司(法人独资)
住　　所	珠海高栏港经济区石化九路306号
法定代表人	刘准
成立日期	2003年06月05日

重要提示

1. 经营范围：商事主体的经营范围由章程确定。经营范围中属于法律、法规规定应当经批准的项目，在依法取得许可审批后方可从事该经营活动。
2. 年度报告：商事主体应当在每年的成立周年之日起两个月内提交上一年度的年度报告。
3. 信息查询：商事主体经营范围、出资情况、营业期限、许可审批项目等有关事项和其他监管信息，请登录珠海市商事主体登记许可及信用信息公示平台（网址：http://ssgs.zhuhai.gov.cn）或扫描照上的二维码查询。

登记机关　珠海市工商行政管理局金湾分局

2015 年 12 月 31 日

中华人民共和国国家工商行政管理总局监制

附件 2

授 权 委 托 书

江苏怡达化学股份有限公司、吉林怡达化工有限公司和珠海怡达化学有限公司共同全权委托上海海华永泰（北京）律师事务所及其指定的律师，对原产于美国的进口相关乙二醇和丙二醇的单烷基醚产品向中华人民共和国商务部提出反倾销和反补贴调查申请。

上海海华永泰（北京）律师事务所律师的代理权限为全权代理，具体权限为：

1、认真履行职责，及时依法保护委托方合法权益；

2、为反倾销和反补贴调查事宜搜集和整理有关证据和材料；

3、起草反倾销和反补贴调查申请书及相关文件；

4、代表委托方向中华人民共和国商务部提交反倾销和反补贴调查的书面申请；

5、代表委托方向中华人民共和国商务部提供相关证据和材料，并依法查阅与本案件有关的证据和材料；

6、代表委托方参加题述案件的审理和听证；并代表委托方发表陈述意见和/或针对其他利害关系方的观点提出抗辩意见；对调查机关发布的裁决和披露的信息发表评论；

7、如经中国政府和委托方同意，代表甲方参加中国政府与国外生产商（或出口商）可能进行的承诺和协商的谈判工作；

8、代表委托方按照中华人民共和国商务部规定的时间提供补充材料；

9、代表委托方进行最终裁定做出前所需要的工作；

本授权书所规定的权限在授权事宜完成时终结，或委托方认为有必要结束授权时终结。授权终结时，与之相应的委托代理合同同时终止。

委托方（盖章）：江苏怡达化学股份有限公司

吉林怡达化工有限公司

珠海怡达化学有限公司

二〇二〇年五月十日

授 权 委 托 书

江苏怡达化学股份有限公司、吉林怡达化工有限公司和珠海怡达化学有限公司共同全权委托上海海华永泰（北京）律师事务所及其指定的律师，对原产于美国的进口相关乙二醇和丙二醇的单烷基醚产品向中华人民共和国商务部提出反倾销和反补贴调查申请。

上海海华永泰（北京）律师事务所律师的代理权限为全权代理，具体权限为：

1、认真履行职责，及时依法保护委托方合法权益；

2、为反倾销和反补贴调查事宜搜集和整理有关证据和材料；

3、起草反倾销和反补贴调查申请书及相关文件；

4、代表委托方向中华人民共和国商务部提交反倾销和反补贴调查的书面申请；

5、代表委托方向中华人民共和国商务部提供相关证据和材料，并依法查阅与本案件有关的证据和材料；

6、代表委托方参加题述案件的审理和听证；并代表委托方发表陈述意见和/或针对其他利害关系方的观点提出抗辩意见；对调查机关发布的裁决和披露的信息发表评论；

7、如经中国政府和委托方同意，代表甲方参加中国政府与国外生产商（或出口商）可能进行的承诺和协商的谈判工作；

8、代表委托方按照中华人民共和国商务部规定的时间提供补充材料；

9、代表委托方进行最终裁定做出前所需要的工作；

本授权书所规定的权限在授权事宜完成时终结，或委托方认为有必要结束授权时终结。授权终结时，与之相应的委托代理合同同时终止。

委托方（盖章）：江苏怡达化学股份有限公司

吉林怡达化工有限公司

珠海怡达化学有限公司

二〇二〇年五月十日

授 权 委 托 书

江苏怡达化学股份有限公司、吉林怡达化工有限公司和珠海怡达化学有限公司共同全权委托上海海华永泰（北京）律师事务所及其指定的律师，对原产于美国的进口相关乙二醇和丙二醇的单烷基醚产品向中华人民共和国商务部提出反倾销和反补贴调查申请。

上海海华永泰（北京）律师事务所律师的代理权限为全权代理，具体权限为：

1、认真履行职责，及时依法保护委托方合法权益；

2、为反倾销和反补贴调查事宜搜集和整理有关证据和材料；

3、起草反倾销和反补贴调查申请书及相关文件；

4、代表委托方向中华人民共和国商务部提交反倾销和反补贴调查的书面申请；

5、代表委托方向中华人民共和国商务部提供相关证据和材料，并依法查阅与本案件有关的证据和材料；

6、代表委托方参加题述案件的审理和听证；并代表委托方发表陈述意见和/或针对其他利害关系方的观点提出抗辩意见；对调查机关发布的裁决和披露的信息发表评论；

7、如经中国政府和委托方同意，代表甲方参加中国政府与国外生产商（或出口商）可能进行的承诺和协商的谈判工作；

8、代表委托方按照中华人民共和国商务部规定的时间提供补充材料；

9、代表委托方进行最终裁定做出前所需要的工作；

本授权书所规定的权限在授权事宜完成时终结，或委托方认为有必要结束授权时终结。授权终结时，与之相应的委托代理合同同时终止。

委托方（盖章）：江苏怡达化学股份有限公司

吉林怡达化工有限公司

珠海怡达化学有限公司

二〇二〇年五月十日

附件 3

律 师 指 派 书

为申请对原产于美国的进口相关乙二醇和丙二醇的单烷基醚产品进行的反倾销和反补贴调查之目的，江苏怡达化学股份有限公司、吉林怡达化工有限公司和珠海怡达化学有限公司授权上海海华永泰（北京）律师事务所作为其全权代理人，代理题述案件的申请及调查工作。

上海海华永泰（北京）律师事务所根据上述委托，特指派本所吴必轩律师代理，处理与上述委托相关的全部事宜。

上海海华永泰（北京）律师事务所

二〇二〇年五月十日

附件 4

执业机构 上海海华永泰（北京）律师事务所

执业证类别 专职律师

执业证号 11101201510687324

法律职业资格或律师资格证号 A20091101064115

发证机关 北京市司法局

发证日期 2017 年 05 月 02 日

持证人 吴必轩

性别 男

身份证号 110106197307084810

律师年度考核备案

考核年度	二〇一九年度
考核结果	称职
备案机关	北京市朝阳区司法局 专用章 律师年度考核备案
备案日期	2019年6月-2020年5月

律师年度考核备案

考核年度	二〇二〇年度
考核结果	称职
备案机关	北京市朝阳区司法局 专用章 律师年度考核备案
备案日期	2020年6月-2021年5月

附件 5

反倾销和反补贴调查支持声明

江苏德纳化学股份有限公司和江苏天音化工有限公司是国内生产相关乙二醇和丙二醇的单烷基醚的主要企业。天音化工是德纳化学的全资子公司。

关于江苏怡达化学股份有限公司及其子公司作为申请人，代表国内产业对原产于美国的进口相关乙二醇和丙二醇的单烷基醚提起反倾销和反补贴调查申请事宜，我们支持此次申请。

特此声明。

江苏德纳化学股份有限公司

江苏天音化工有限公司

二〇二〇年五月十日

反倾销和反补贴调查支持声明

江苏德纳化学股份有限公司和江苏天音化工有限公司是国内生产相关乙二醇和丙二醇的单烷基醚的主要企业。天音化工是德纳化学的全资子公司。

关于江苏怡达化学股份有限公司及其子公司作为申请人，代表国内产业对原产于美国的进口相关乙二醇和丙二醇的单烷基醚提起反倾销和反补贴调查申请事宜，我们支持此次申请。

特此声明。

江苏德纳化学股份有限公司

江苏天音化工有限公司

二〇年五月十日

编 号 320100000201612020115

营业执照

（副 本）

统一社会信用代码 91320100768192281O （1/1）

名　　称	江苏德纳化学股份有限公司
类　　型	股份有限公司(台港澳与境内合资、未上市)
住　　所	南京化学工业园区白龙路2号
法定代表人	秦旭东
注册资本	51500万元人民币
成立日期	2004年12月07日
营业期限	2004年12月07日至******
经营范围	间苯二甲腈、间苯二甲胺、二元醇醚、环氧乙烷系列产品的生产，销售自产产品；精细化工产品的生产及销售；从事上述同类产品的进出口业务（不含分销）（不涉及国营贸易管理商品，涉及配额、许可证管理商品的，按国家有关规定办理申请）。（以上项目涉及许可的，按许可证所列范围经营）（依法须经批准的项目，经相关部门批准后方可开展经营活动）

00585219

登记机关 南京市工商行政管理局

2016 年 12 月 02 日

企业信用信息公示系统网址：www.jsgsj.gov.cn:58888/province

中华人民共和国国家工商行政管理总局监制

编 号 320282000201604250221

营业执照

(副 本)

统一社会信用代码 91320282704048141l (1/2)

名　　称	江苏天音化工有限公司
类　　型	有限责任公司（法人独资）
住　　所	宜兴市周铁镇前观村周家桥堍
法定代表人	秦小琪
注册资本	4173.5万元整
成立日期	1999年01月08日
营业期限	1999年01月08日至2049年01月07日
经营范围	生产双封端聚醚（危险化学品凭安全生产许可证经营）；生产聚乙二醇、乳化剂、化纤油剂、增塑剂、双封端聚醚（除危险化学品）、聚醚；自营和代理各类商品及技术的进出口业务（国家限定企业经营或禁止进出口的商品和技术除外，不含分销业务及其他国家禁止、限制类项目，涉及专项审批的凭有效许可证明经营）。以下范围限分支机构生产：生产二元醇醚、二元醇醚醋酸酯。（依法须经批准的项目，经相关部门批准后方可开展经营活动）

登记机关 宜兴市市场监督管理局 2016 年 04 月 25 日

请于每年1月1日至6月30日履行年报公示义务

企业信用信息公示系统网址：www.jsgsj.gov.cn:58888/province

中华人民共和国国家工商行政管理总局监制

附件 6

非保密概要

附件 6：关于中国相关乙二醇和丙二醇的单烷基醚生产和进口情况的说明

本附件内容包含申请人和支持申请企业的同类产品产量数据，属于商业秘密，故申请保密。

在申请书公开版本的正文部分，已经以指数形式提供了上述数据，并且提供了申请人和支持申请企业的同类产品合计产量占国内总产量的比例。该比例始终超过 90%，根据《反倾销调查立案暂行规则》第五条的规定，申请人有资格代表国内产业提出本次反倾销调查申请。

关于中国相关乙二醇和丙二醇的单烷基醚生产和进口情况的说明

一、国内生产和需求情况

国内生产乙二醇和丙二醇的单烷基醚的企业主要有怡达和德纳两家。“怡达”是指江苏怡达化学股份有限公司，及其子公司吉林怡达化工有限公司和珠海怡达化学有限公司。“德纳”是指江苏德纳化学股份有限公司及其子公司江苏天音化工有限公司。2016年至2019年期间，中国相关乙二醇和丙二醇的单烷基醚的产量如下：

（单位：吨）

	怡达	德纳	其他合计	全国总产量
2016 年	【 】	【 】	8,000	88,089
2017 年	【 】	【 】	4,200	97,002
2018 年	【 】	【 】	2,600	99,568
2019 年	【 】	【 】	2,000	105,181

乙二醇和丙二醇的单烷基醚是性能优越的溶剂，用途十分广泛，主要用作溶剂，也用作分散剂、稀释剂、萃取剂和航空燃料抗冻剂，也是重要的有机合成原料。根据我协会的分析统计，2016年至2019年期间全国需求情况如下：

	全国总需求量（吨）
2016 年	114,170
2017 年	141,192
2018 年	162,227
2019 年	166,802

二、进口情况

乙二醇的单烷基醚有独立的税则号29094400，可直接了解进口情况。丙二醇的单烷基醚归在税则29094990下，该税则号项下还包含其他产品。我中心根据掌握的中国海关进口报关数据、美国海关出口数据以及对市场及下游的跟踪统计，确定从美国进口丙二醇单烷基醚的情况。

	乙二醇的单烷基醚		丙二醇的单烷基醚	
	数量（吨）	金额（美元）	数量（吨）	金额（美元）
2016 年	8,688	13,091,501	9,407	15,410,994
2017 年	10,995	15,076,501	12,964	19,851,025
2018 年	13,284	20,700,078	20,032	35,988,616
2019 年	17,519	22,023,897	12,988	20,339,613

特此证明。

中国涂料工业协会

二〇二〇年五月十日

附件 7

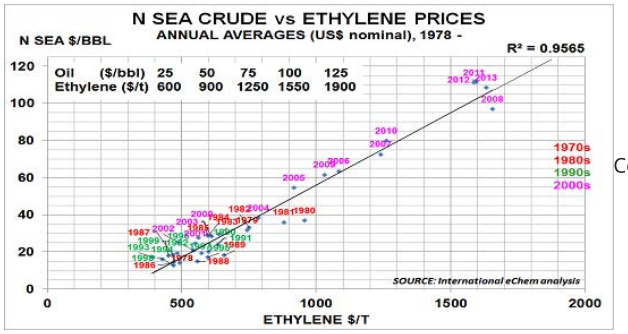
序号	税则号列	中文货品名称	最惠国税率(%)	协定税率(%)	特惠税率(%)	普通税率(%)
		-芳香醚及其卤化、磺化、硝化或亚硝化衍生物：				
2075	2909.3010	---1-烷氧基-4-（4-乙烯基环己基）-2，3-二氟苯	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,韩国KR,澳AU,香港HK,澳门MO,格GE 5 巴PK	0 受惠国LD	30
2076	2909.3020	---4-（4-烷氧基苯基）-4'-烷烯基-1，1'-双环己烷及其氟代衍生物	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,韩国KR,澳AU,香港HK,澳门MO,格GE 5 巴PK	0 受惠国LD	30
2077	2909.3090	---其他	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,韩国KR,澳AU,香港HK,澳门MO,格GE 5 巴PK	0 受惠国LD	30
		-醚醇及其卤化、磺化、硝化或亚硝化衍生物：				
2078	2909.4100	--2，2′-氧联二乙醇（二甘醇）	5.5Δ3	0 东盟AS,巴PK,智利CL,新西兰NZ,哥CR,瑞士CH,冰岛IS,韩国KR,澳AU,香港HK,澳门MO,台湾TW,格GE	0 受惠国$_2$LD$_2$	30
2079	2909.4300	--乙二醇或二甘醇的单丁醚	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,韩国KR,澳AU,香港HK,澳门MO,台湾TW,格GE 5 巴PK	0 受惠国LD	30
2080	2909.4400	--乙二醇或二丁醇的其他单烷基醚	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,澳AU,香港HK,澳门MO,格GE 3.6 韩国KR 5 巴PK	0 受惠国LD	30
		--其他：				
2081	2909.4910	---间苯氧基苄醇	4	0 东盟AS,巴PK,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,韩国KR,澳AU,香港HK,澳门MO,格GE	0 受惠国LD	11
2082	2909.4990	---其他	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,冰岛IS,澳AU,香港HK,澳门MO,格GE 3.6 韩国KR 5 巴PK	0 受惠国LD	30
2083	2909.5000	-醚酚、醚醇酚及其卤化、磺化、硝化或亚硝化衍生物	5.5	0 东盟AS,智利CL,新西兰NZ,秘鲁PE,哥CR,瑞士CH,澳AU,香港HK,澳门MO,格GE 3.6 韩国KR 5 巴PK	0 受惠国LD	30

附件 8

Ethylene prices have 96% correlation to oil prices

Chemical companies

By Paul Hodges on 20th March 2014 in Chemical companies



Companies are about to review their Q1 performance, and re-forecast profit and revenue for the rest of the year. Most will be disappointed with results so far, as the long-promised economic recovery has again failed to appear.

This will be no surprise to blog readers. But there is another and connected issue for Management Teams to worry about as we head into Q2. This is the unnatural calm that has settled over the oil markets in the past 6 months, as the blog discussed on Tuesday.

What would happen to their business if oil follows copper and other commodity markets and starts to tumble? Would it really stay within a narrow range, above $90/bbl? This seems highly unlikely, given the enormous amount of speculative money tied up in the market.

And if it does fall below $90/bbl, what would this mean for the prices of the major petrochemicals?

This question can at least be answered with more than 95% accuracy, as the above chart shows:

- It maps annual average European ethylene prices on the x-scale; annual average N Sea oil prices on the y-scale
- The data goes back to the first ethylene contract price in 1978 and is colour-coded by decade
- It shows there is over a 95% correlation between the two: if oil prices move, so does ethylene

The same rule applies to all the other major petrochemicals – propylene, butadiene, benzene and paraxylene. The propylene correlation is 97%, butadiene is 90%, benzene is 92% and even paraxylene is 87%.

Thus if oil prices do fall, we can be reasonably confident about what will happen to product prices. As the table shows on the chart, an oil price of $75/bbl would indicate an ethylene price of $1250/t; oil prices at $50/bbl would suggest ethylene prices of $900/t.

In the long-term of course, lower prices would be good for demand. Consumers would have more discretionary cash to spend. But oil producers have got used to today's higher prices, and factored them into their budget calculations. Riots, or worse, might easily break out in some countries if these budgets came under pressure from lower prices.

Of course, managements might just decide to ignore the issue, and hope the consensus is right to assume oil prices will never again fall below $100/bbl. But history would suggest this is actually a very risky position to take. Anyone without a Plan B might look very exposed, given the weaknesses now being exposed in the global economy.

PREVIOUS POST

China's lending problems begin to worry wider world - too late

NEXT POST

Cotton prices slip as US supply rises and China's imports fall

Select Category

Tags

AUTO SALES | BANK OF ENGLAND | BASF | BENZENE | BRENT OIL PRICES | CENTRAL BANKS | CHINA | CHRYSLER | CONSUMER SPENDING | CREDIT BUBBLE | CREDIT CRUNCH

附件 9

OIL SHALE SPECIMEN. *Image Courtesy of United States Geological Survey*

SUBSIDIZING OIL SHALE

TRACING FEDERAL SUPPORT FOR OIL SHALE DEVELOPMENT IN THE U.S.

TAXPAYERS FOR COMMONSENSE
MAKING GOVERNMENT WORK
WWW.TAXPAYER.NET

OIL SHALE SPECIMEN.
Image Courtesy of United States Geological Survey

Although the oil shale industry is still in its commercial infancy, it has a long history of government support that continues today. The Bureau of Land Management recently issued two new research, development and demonstration leases and new federal regulations for commercial leases and royalty rates are expected any day. Before the federal government goes down that road it's important to take a look back and ask whether we should be throwing good money after bad.

Oil shale, or kerogen shale, is a sedimentary rock that contains liquid hydrocarbons that are released when heated. Considered an oil precursor, kerogen is fossil organic matter that has not had exposure to high enough temperatures or been in the ground long enough to have developed into oil. Kerogen requires a large and expensive energy investment to produce liquid fuel. This leaves producers with the challenge of how to get more energy out of the rock than energy used to obtain the liquid fuel in the first place.

Federal intervention in the development of oil shale dates back to the early 20th century when by executive order the naval petroleum and oil shale reserves were created to ensure a military oil supply. In response, the Bureau of Mines program began research into exploiting oil shale technology and in the 1960s private industry followed. But significant action was limited until the 1970s, when in response to the gas shortages Congress intervened in oil shale development, in hopes of creating a domestic fuel alternative. Their unsuccessful attempt to spur large-scale commercial development of oil shale and other unconventional fossil fuels became a notorious waste of federal funds.

Since then federal support has continued in various forms. Although not a key part of the overall energy policy agenda, federal subsidies continue to appear in legislation and administrative actions. A batch of subsides including the requirement of a federal research and development leasing program were included in the 2005 Energy Bill. The 2008 Economic Stabilization Act expanded an existing conventional oil and gas tax break for oil shale, and in 2008 a commercial leasing program emerged out of the Bureau of Land Management. As recently as the spring of 2012, Congress proposed federal sweeteners to help get oil shale get off the ground as part of freestanding

legislation and as an add-on to the federal transportation authorization bill.

Despite this support, successful development of a commercial oil shale industry has remained elusive. To this day, oil shale technology has never been successfully demonstrated on a large scale.[1] Many attempts to produce at the commercial level have occurred, but high costs and volatility in the markets have led to plant failures in the past, resulting in the loss of millions of taxpayer dollars. The allure of domestic fuel production continues to make oil shale a favorite discussion piece for lawmakers. But providing oil shale with additional government incentives, including commercial federal leases prior to proving economic viability given oil shale's track record of failure, will only add to the layers of subsidies the oil shale industry has already received and once again leave taxpayers with little to show for it.

OIL SHALE RESOURCES WITHIN GREEN RIVER FORMATION*

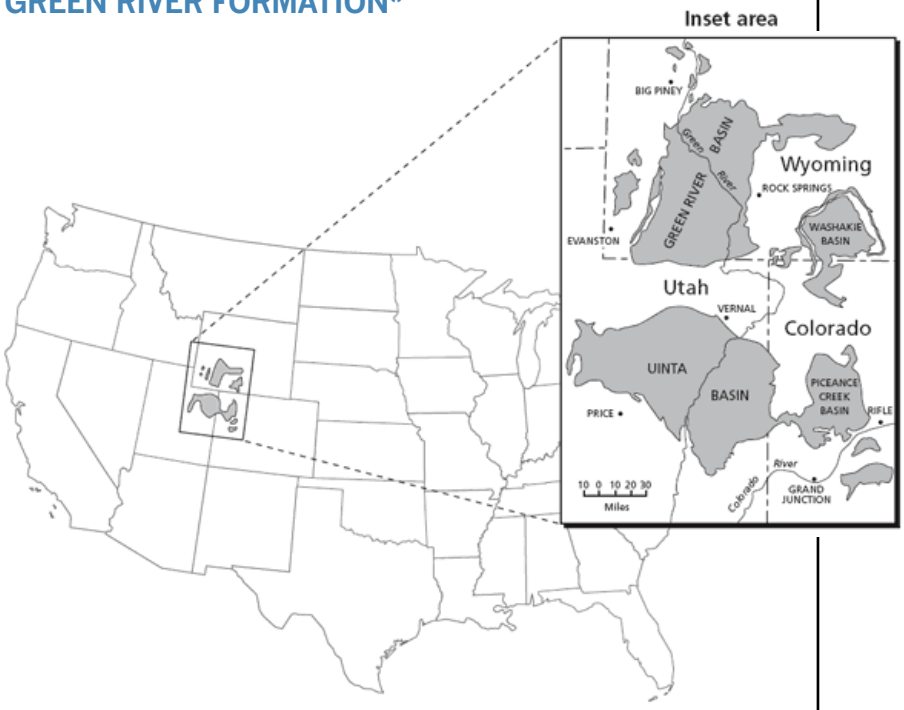


*Image used with permission by the RAND Corporation: James T. Bartis et al., "Oil Shale Development in the United States: Prospects and Policy Issues," RAND Corporation (MG-414-NETL), 2005. Adapted from: Smith, J. W., "Oil Shale Resources of the United States," *Mineral and Energy Resources*, Vol. 23, No. 6, Colorado School of Mines, 1980.

HISTORY OF OIL SHALE SUBSIDIES

Because the United States is estimated to have 75% of the world's oil shale deposits,[2] the prospect of extracting oil from shale has been around for more than a century. The Government Accountability Office has estimated that oil shale deposits in the Green River Formation of Colorado, Utah, and Wyoming (displayed in the figure above) could yield more than 1.5 trillion barrels of recoverable oil[3] and in 2005 the RAND Corporation estimated that the same area could produce up to 800 billion barrels of recoverable oil.[4]

Federal interest tends to ebb and flow around increases in gas prices, new information on the amount of oil that could be recoverable from oil shale deposits, and most recently a need for increased revenues from royalties and fees charged for its extraction, among other things.

Despite questions regarding its feasibility or environmental consequences, the prospect of capturing some of this oil has led to a long history of federal support for oil shale. Over the years oil shale has received layers upon layers of subsidies. Most support came in the form of loans and loan guarantees and price guarantees provided through the Department of Energy in the 1980s, but other subsidies including valuable land giveaways occurred much earlier.

OIL SHALE COMPANY'S FIRST RETORT*, 1923.
*an air-tight vessel used for oil shale extraction
Image Courtesy of United States Geological Survey

More than a century ago, the **Pickett Act of 1910** authorized the acquisition of petroleum rich lands to ensure an emergency supply of fuel to the Navy during times of war. By 1927, a series of Executive Orders had designated three plots of land between Utah and Colorado for such use—titled the Naval Oil Shale Reserves (NOSR-1, NOSR-2, NOSR-3).[5,6] These three plots of land would be the sites for numerous attempts by oil shale companies and federal government to jumpstart the oil shale industry.

In the 1980s, two subsidies—the loan guarantee and the price guarantee—were the subsidies of choice for the oil shale industry. As previously mentioned, the 1980s were the heyday of federal support for oil shale. An entire federal entity, **the Synthetic Fuels Corporation**, was created solely for the purpose of subsidizing unconventional fossil fuel development like oil shale. More than $3 billion (Table 1) was provided to the oil shale industry in federal loan guarantees.

Federal loan guarantees allow borrowers to receive a loan with the federal government assuming the risk. According to the U.S. House of Representatives Rules Committee, a loan guarantee is a "statutory commitment by the federal government to pay part or all of a loan's principal and interest to a lender or

TABLE 1: LOAN GUARANTEES TO OIL SHALE

PROJECT TITLE	COMPANY	DATE COMMITTED	TOTAL VALUE (MILLIONS)
Colony II Project[1]	The Oil Shale Corporation (TOSCO)	August 1981	$1,150
Cathedral Bluffs Project[2]	Cathedral Bluffs Shale Oil Company*	July 1983	$1,800
Seep Ridge Project[3]	Geokinetics, Inc.	December 1983	$21
Parachute Creek Phase I Project[4]	Union Oil Company	October 1985	$300
		TOTAL	**$3,271**

* *Jointly-owned by Tenneco Shale Oil Company and Occidental Petroleum Corporation*

1 Anthony Andrews. "Oil Shale: History, Incentives, and Policy." *Congressional Research Service*. April 13, 2006. http://www.fas.org/sgp/crs/misc/RL33359.pdf
2 *Energy Law Journal.* "Report of The Committee On Synthetic Fuels." Vol. 5:1. 1984.
3 *Ibid.*
4 *U.S. General Accounting Office.* "Parachute Creek Shale Oil Project's Economic and Operational Outlook." June 1987. http://www.gao.gov/assets/150/145485.pdf

the holder of a security in case the borrower defaults. The Federal Credit Reform Act of 1990 requires that the cost of guaranteed loans be included in the computation of budget authority and outlays. The congressional budget resolution includes loan guarantee totals."[7] Federal loan guarantees placed the full faith and credit of the federal Treasury behind a project leaving taxpayers to assume the risk in the event of default, which is what happened in the case of oil shale.

Another generous form of subsidy provided for oil shale development in the 1980s was the price guarantee. Price guarantees provided companies with a minimum price, thereby ensuring profitability regardless of market conditions. Taxpayers are asked to absorb any difference. Because it is difficult to calculate the cost of both producing commercial oil shale and predicting its overall market rate, a price guarantee can be a very valuable (or costly) subsidy. For example, if fuel derived from oil shale could only sell on the open market at $35 per barrel and a price guarantee was set at $60 per barrel, taxpayers would cover the gap, providing a $25 subsidy per barrel. Some estimates have cited $30-$70 per barrel as a point where oil shale becomes cost-competitive; but even with a range this large, it is difficult to make any assumption without having ever commercially produced oil shale. Below (Table 2) is a list of price guarantees provided to oil shale in the early 1980s and their estimated value at the time.

In addition to loan and price guarantees, tax provisions were written into the Internal Revenue Code (IRC) to provide further incentives for oil shale production. Created in the Windfall Profit Tax Act of 1980, Congress provided the alternative fuel production tax credit—a $3 per barrel credit for oil shale and other alternative fuel producers that was indexed to inflation. The tax credit was designed to take effect only when oil prices fell below $23.50 per barrel and phase out when prices rose above $29.50 (1979 dollars). Soon after, the Economic Recovery Tax Act of 1981 created multiple tax credits for the oil and gas industry from which oil shale producers were also able to benefit.

TABLE 2: PRICE GUARANTEES TO OIL SHALE

PROJECT TITLE	COMPANY	DATE COMMITTED	TOTAL VALUE (MILLIONS)
Parachute Creek Phase I Project[1]	Union Oil Company	July 1981	$400
Parachute Creek Phase I Project[2]	Union Oil Company	October 1985	$173
Parachute Creek Phase II Project[3]	Union Oil Company	December 1983	$2,700
Cathedral Bluffs Project[4]	Cathedral Bluffs Shale Oil Company*	July 1983	$378
Seep Ridge Project[5]	Geokinetics, Inc.	December 1983	$24
		TOTAL	**$3,675**

** Jointly-owned by Tenneco Shale Oil Company and Occidental Petroleum Corporation*

1 *U.S. General Accounting Office.* "Parachute Creek Shale Oil Project's Economic and Operational Outlook." June 1987. http://www.gao.gov/assets/150/145485.pdf
2 *Ibid.*
3 *Ibid.*
4 *Energy Law Journal.* "Report of The Committee On Synthetic Fuels." Vol. 5:1. 1984.
5 *Ibid.*

SYNTHETIC FUELS CORPORATION

As described above, the U.S. Synthetic Fuels Corporation (SFC) was created as a mechanism to provide subsidies for unconventional fossil fuels like oil shale. The SFC was established in the Energy Security Act of 1980, a bill that was enacted in response to high oil prices in the 1970s. Under this act the DOE provided the SFC with a $20 billion bank account to be used for the creation and development of synthetic fuel projects, including oil shale.[8] The SFC would distribute loan guarantees and price-floor subsidies while requiring production of synthetic fuels to be equivalent to 500,000 barrels a day by 1987 and 2 million (or 1.5m) barrels a day by 1992.[9]

In 1986, six years after its creation, the SFC folded after "spending billions without providing any fuel."[10] The recession that occurred in the early 1980s coupled with a sharp drop in oil prices from $40 to $8,[11] made synthetic fuel production a costly investment. In addition, high interest rate and the passage of the 1982 Tax Equity and Fiscal Responsibility Act, which reduced incentives, made the large investments required to develop synthetic fuels look too risky.[12]

After the corporation's initial investment of $20 billion in federal funds, the corporation was estimated to have spent close to $88 billion over its six-year lifetime.[13] Sluggish activity at SFC, charges of lavish spending, scandals, and improper management were also cited as reasons behind SFC's closure. President Reagan drastically scaled back administrative costs and large subsidies, and required companies to provide most of the capital for proposed plants. Proposals, such as a $5 billion oil shale plant in Parachute, Colorado that was operated by Exxon, were shelved due to high costs without further federal funding (see case study that follows). Companies already in the process of building plants, as was the case with the $2.7 billion Great Plains Coal Gasification Plant, feared significant losses and threatened to cancel construction without further federal assistance.[14]

GEOKINETICS' OIL SHALE DEVELOPMENT SITE, 1981.
Image Courtesy of United States Geological Survey

附件 10

美国和加拿大页岩气产业政策借鉴

王 南[1,2] 刘兴元[3] 杜 东[4] 雷丹凤[1,2] 杨 晶[1]

（1 中国石油勘探开发研究院廊坊分院 2 国家能源页岩气研发(实验)中心

3 中国石油物资公司 4 中国石油勘探开发研究院）

摘 要 美国、加拿大政府为鼓励非常规资源开发，出台了一系列页岩气产业扶持政策，其中包括对页岩气勘探、开发实行税收减免及财政补贴；建立专项基金资助研究机构开展技术研发；打造多元化的投资环境，建立市场机制等等。这些举措降低了页岩气开发成本，促进了页岩气产业的快速发展。在鼓励页岩气发展的同时，两国还加强行业监管，出台了严格的环境保护政策，对作业区水资源、渔业资源和野生动物进行保护。本研究在综合分析了美、加两国页岩气产业政策之后，建议我国政府借鉴北美页岩气发展经验，针对页岩气产业出台一定的扶持政策；设立基金扶持项目，通过多领域技术合作，最终形成一套完整的页岩气开发配套技术；同时制定严格的环境保护政策，减少环境污染，保障我国页岩气资源的安全、有效开发。

关键词 页岩气 产业政策 税收 补贴 环境保护管网建设 美国 加拿大

北美页岩气革命的成功点燃了其他国家开发本土页岩气资源的热情。除美国和加拿大外，中国、波兰、澳大利亚等30多个国家开始启动对页岩气的研究工作，但由于起步较晚，缺乏配套的产业政策，基本都处于起步阶段。美国是世界上页岩气资源勘探开发最早、技术最成熟的国家。美国政府长期以来一直支持和鼓励对本土非常规资源的勘探开发，特别是对页岩气资源，陆续出台了多项扶持政策，从而大大提高了油气生产商的开发热情，降低了页岩气的生产成本，刺激了页岩气产业的快速发展。

一、美国和加拿大页岩气产业政策经验

1. 提供政策支持，对页岩气勘探、开发实行税收减免及财政补贴

20世纪70年代末，美国政府就开始鼓励开发本土的非常规资源。政府将致密气、煤层气和页岩气统一划归为非常规天然气，并通过立法落实对非常规天然气的补贴政策。这些补贴政策最早开始于1978年的《天然气政策法案》（见表1），但在该法案中并没有明确说明对页岩气的具体补贴额度和年限。1980年，美国国会通过《原油暴利税法》，其中第29条“非常规能源生产税收减免及财政补贴政策”明确规定：从1980年起，美国本土钻探的非常规天然气（煤层气和页岩气）可享受每桶油当量3美元的补贴。美国国会后来又将第29条法案的执行期续延了两次至1992年。该政策有效地激励了非常规气井的钻探，使美国在1980－1992年间非常规气井数量爆增，达新增矿井总数的78%。

1992年，美国国会再次对《原油暴利税法》第29条进行修订，对1979－1999年期间钻探、2003年之前生产的页岩气实行税收减免政策，减免幅度为0.5美元/千立方英尺（约0.02美元/立方米），而1989年美国的天然气价格仅为1.75美元/千立方英尺（约0.07美元/立方米）。美国对页岩气的税收减免政策前后共持续了23年。

在1997年颁布的《纳税人减负法案》中，美国政府依然延续对非常规能源实行税收减免政策，直到2006年美国政府出台新的产业政策。新的产业政策规定：在2006年投入运营、用于生产非常规能源的油气井，可在2006－2010年享受每吨油当量22.05美元的补贴。此项政策使得美国非常规气探井数量大幅上升，天然气储量和产量也随之大幅增加。

在美国，除联邦政府出台的一系列产业政策外，拥有页岩气资源的得克萨斯州、俄亥俄州、宾夕法尼亚州的州政府也相继颁布了一些鼓励政策，其中最具代表性的是得克萨斯州。自1992年以来，得州政府对页岩气开发免征生产税，实行每立方米3.5美分的州政府补贴（占州政府全年税收的7.5%）。这些补贴政策与联邦政府的政策并不冲突，在很大程度上鼓励了石油天然气公司对页岩气资源进行开发。

加拿大是除美国外世界上另一个对页岩气进行商业化开发的国家。2008年，加拿大天然气产量已占据北美天然气市场将近50%的份额，这都得益于该国国家政策的大力支持。加拿大政府在制定产业扶持政策时，主要参考了美国的产业政策，例如对生产商提供一定税收优惠，对技术研发项目给予一定扶持，以及在水处理和环境保护方面出台指导意见。

在加拿大从事油气勘探和开采，可享受联邦和省区两级政府的各种税收优惠政策。对于页岩气开发等高风险投入的矿产行业，加拿大财政部将给予税收补贴鼓励，投入当年减免税率为100%，相当于生产前全额减免税率；在生产期，政府还会对高风险、低收益的项目进行一定的税额减免，最高减免额度为项目当年缴纳税额的30%。

2. 建立专项研究基金资助研究机构开展技术研发，促进整体产业技术进步

20世纪70年代初，美国天然气产量持续下降，造成本土天然气供应紧张。为缓解能源供应问题，美国政府积极推动本土非常规气的勘探和开发，成立了美国天然气研究院（GTI），旨在整合其国内天然气领域的技术研究人才，开展非常规能源技术研究。美国天然气院作为非盈利性机构，在后来的很多年，一直在为美国能源行业提供技术支撑，在一定程度上支持政府实现既定的产业政策。

1976年，美国联邦政府启动“东部页岩气项目”。美国联邦能源管理委员会（FERC）也同时批准了FERC研究中心和美国天然气院的研究预算。政府还邀请多所大学、研究机构和私营的石油天然气公司加入该项目，进行联合研究。同年，FERC研究中心成功研发页岩气大型水力压裂技术，并获得了该项技术的专利。1977年，美国能源部率先向外界展示了该项技术。该技术对非常规天然气产业产生了深远影响，极大地提高了非常规能源的开发效率，许多中小型公司开始运用这种技术。

20世纪80年代末至90年代初，

表1 美国联邦政府主要产业政策

年份	公布法案及相关政策	具体内容
1978	《天然气政策法案》（Natural Gas Policy Act of 1978）	将致密气、煤层气和页岩气统一划归为非常规天然气，通过立法保证非常规天然气的开发税收和补贴政策
1980	《原油暴利税法》中第29条“非常规能源生产税收减免及财政补贴政策”（Windfall Profits Tax Act, Section 29 tax credit for production of Non-conventional fuels）	1980年至1992年钻探的非常规天然气（包括煤层气和页岩气）可享受每油桶当量3美元的补贴
1992	第29条“非常规能源生产税收减免及财政补贴政策”修正案	设立了能源生产税收津贴，持续非常规气补贴政策
1992	《能源政策法案》（Energy Policy Act of 1992）	扩展了非常规能源的补贴范围
1997	《纳税人减负法案》（Taxpayer Relief Act of 1997）	延续了对非常规能源的税收补贴政策
2004	《美国能源法案》（Energy Act 2004）	10年内政府每年投资4500万美元用于支持非常规天然气的研发
2005	《能源政策法案》第1345条（Energy Policy Act of 2005, section 1345）	2006年投入运营的生产非常规能源的油气井，可在2006－2010年获得每桶油当量3美元的补贴
2009	推进国家间在清洁能源领域的合作	政府间建立长期的能源技术合作关系，帮助一些页岩气资源富集的国家开发页岩气资源
2011	美国国务院成立能源资源局	加强国际能源领域合作，使美国的能源结构向更为清洁的方向转变

美国能源部设立了很多专项基金，支持研究机构和中小型技术公司开展新技术研究。在专项基金的资助下，美国能源部所属的Sandia国家实验室很快研发出包括微地震成图、页岩及煤层水力压裂等技术。1991年，在美国能源部和美国联邦能源管理委员会的共同资助下，得克萨斯州天然气公司Mitchell Energy在该州北部的Barnett气田成功完钻第一口页岩气水平井，该项目主要技术支持由美国天然气研究院提供。1998年，同样是在政府的资助下，Mitchell Energy公司研发了具有经济效益的滑溜水压裂技术。直到今天，该技术仍为核心技术，被广泛运用于页岩气开发。2004年，美国政府开始新一轮的基金资助，《美国能源法案》规定，政府将在未来10年内每年投资4500万美元用于包括页岩气在内的非常规天然气研发。

从20世纪80年代至今，美国能源部、美国联邦能源管理委员会等多个政府部门先后投入了60多亿美元用于非常规气的勘探开发，其中用于培训和研究的费用近20亿美元，后来诸多技术突破都得益于这些研究。其间，美国政府资助研发的技术主要包括：水平井钻井技术、水平井多段压裂技术、清水压裂技术和近期出现的同步压裂技术，这些先进技术的规模化应用提高了页岩气井产量，降低了开采成本，使页岩气生产进入了工厂化、规模化开发阶段。

加拿大政府同样在研发资金和技术支持方面资助了很多研究机构和大学开展页岩气开发技术的研发。政府除设立专项基金外，还召集一些研究机构和私人石油公司联合成立产业内技术研发项目，专门针对页岩气进行技术公关和研发，一般项目研究时间为2 3年，项目的知识产权归政府或牵头机构所有，其他项目参与者都可以共享或优先购买研发出的新技术或新型产品。

3. 引进市场竞争机制，开放天然气价格，降低页岩气开发成本

除了制定税收补贴政策、设立基金支持技术研发外，美国政府还一直致力于打造多元化的投资环境，建立自由市场机制。1978年，美国国会通过了《天然气政策法案》，放松了对天然气价格的管控，使气价的变动完全由市场需求来决定，联邦政府只通过环境保护和管道建设进行有限介入，这在一定程度上使天然气市场成为具有竞争性的市场。这种自由市场机制避免了大型石油公司对气价和市场的垄断，使具有竞争力的中小型石油公司都可以参与市场竞争。

据美国能源信息署（EIA）统计，2003年，美国85%的页岩气都是由中小型石油公司生产的。迫于页岩气产业的低回报、高成本压力，这些公司不断进行技术革新，成为推动美国页岩气开采技术快速发展的主要动力。由于中小型独立油气开发商在技术革新方面行动更快捷，而大公司在长期性和财务稳定性上有更多保证，因此，美国的页岩气产业逐渐出现了中小公司取得技术和产业突破，大公司则对中小公司进行收购和兼并的现象。政府积极推动的这种产业模式丰富和完善了产业链环节，促进了美国页岩气产业的快速发展。

4. 建立输气管网和管网运行的市场化公平准入机制，对管道公司实行税率减免、提供贷款

美国是世界上天然气管网最发达的国家。据统计，美国本土已拥有近40多万千米的天然气管道，这为页岩气入网销售、降低运输成本提供了便利。1992年，美国政府决定取消管道公司对天然气购销市场的控制，禁止天然气生产者拥有天然气管网资产。在产业模式上，美国政府采取了天然气开采和管道运输业务分离的模式，规定管道公司只能从事输送服务，避免垂直垄断型产业链出现。政府还规定天然气生产商和用户对天然气管网拥有公平准入条件，中小型能源公司可以及时通过输气管网销售页岩气。这种产业政策促进了美国天然气市场公平竞争环境的形成，提高了天然气运输市场效率，更好地保护了市场参与者的利益。

对管道公司实行税率减免政策。1996年，为缓解能源供应紧张，降低非常规天然气的开发成本，美国政府向管道公司征收的所得税率仅为12.3%，远低于美国其他工业所得税率（美国平均工业所得税率为21.3%）。2001年，该项税率提高到13.3%，但仍是低于行业平均水平。

对一些地区的天然气管道建设实行激励措施。例如，在阿拉斯加的管网建设项目中，美国政府向当地管道建设公司提供贷款，为大容

量的天然气处理装置提供15%的税收优惠，将大容量天然气管道折旧年限规定为7年。这些政策都降低了管道建设风险。

在天然气管网建设方面，加拿大政府首先确定了本土天然气的生产区块和资源分布情况。加政府学习美国的管网运营模式，鼓励天然气管网的建设，为天然气管道公司提供一定的贷款和税收减免政策，临近美国的区域都有洲际天然气管线。加拿大是世界上主要的天然气出口国，其所产页岩气不但可以满足国内的天然气需求，还可以通过洲际管线出口到美国等国家，特别是在加拿大西南部的不列颠哥伦比亚省（也译作俾诗省）和阿尔伯达省。这两个省拥有丰富的页岩气资源和复杂的天然气管网，为中小型公司开发泥盆纪/密西西比区块提供了便利。

5. 逐步建立完善的页岩气开发环境保护政策

在页岩气开发初期，美国并未对页岩气开采采取任何环境监管措施。后期，随着开采规模不断扩大，页岩气开采在很多地区都产生了环境污染问题。一些环保组织多次呼吁政府，禁止页岩气水力压裂，因为该技术的运用会造成严重的地下水污染。为此，美国政府重新制订了相关的环境保护政策，加强了对页岩气开发过程的环境监管（见表2）。

1996年，美国国会通过了《安全饮用水法》（SDWA）修正案，法案规定，禁止油气运营商在河流、湖泊、水库和地下水水源附近进行页岩气水力压裂；未经美国环境保护局批准，不得向任何水源排放任何污染物。同年，美国国会还通过《清洁空气法》（CAA），要求页岩气生产商必须控制压裂施工过程返排液体中挥发性有机化合物（VOC）的含量。美国环境保护局将派遣专员对页岩气开采活动进行监督，并对违反规定的石油公司进行严厉处罚。

颁布《职业安全与健康法》（OSHA），法案要求，运营商必须将施工现场使用的危险化学品材料清单向政府备案。《综合环境责任与赔偿法》（CERCLA）规定，运营商必须提交危险化学品排放途径，并承诺对可能发生的泄漏事件承担全部责任。美国环境保护局目前仍在对页岩气开采造成的环境污染进行评估，评估结果和经过修订的环境保护条例将同时提交给国会进行审核，具体内容将于2014年公布。

在环境保护方面，加政府要求在加拿大进行页岩气开发的石油公司，必须向政府提供更多的信息，以便更好地利用和保护当地水资源。受政府委托，加拿大石油生产商协会（CAPP）2011年发布了《岩气开发水力压裂技术指导条例》，明确要求加强水资源管理，加强水和液体使用信息的披露。该条例具体内容包括：通过合理的钻井施工管理，对地表和地下水资源的质量和数量进行保护；对施工用水进行循环回收利用，尽量使用清洁水的替代物；测量和公布水资源利用情况，减少对环境影响；支持环保型压裂液添加剂的开发，向公众公布压裂液添加剂的成分等。

在加拿大，前期页岩气在开采过程中对大气和水源造成了一定污染，这使加拿大各省对页岩气开发持谨慎态度。2011年，出于环境保护的考虑，魁北克省已暂停大部分新的天然气开发项目；不列颠哥伦比亚省虽然没有出台严厉政策，但

表2 美国与页岩气相关的主要环境政策

法案缩写	中文名称	内 容
SDWA	《安全饮用水法》	禁止油气运营商在水源附近进行水力压裂作业
CWA	《清洁水法》	禁止未经许可向美国清洁水源排放污染物
CAA	《清洁空气法》	页岩气生产商必须控制压裂施工过程返排液体中的挥发性有机化合物（VOC）的含量
ESA	《濒危物种法》	在能源开发中必须对渔业和野生动物进行保护
MBTA	《候鸟条约》	确保工程作业时钻机不吸引或伤害鸟类
EPCRA	《社区经济规划法》	运营商必须维持工程施工材料的安全性
OSHA	《职业安全与健康法》	运运营商必须将施工现场使用的危险化学品材料清单向政府备案
RCRA	《资源保护和回收法》	提出工程施工中废物回收及处理责任
CERCLA	《综合环境责任与赔偿法》	运营商必须提交危险化学品排放途径

资料来源：美国环境保护局（EPA）。

也对新勘探的页岩气区块采取审慎开发的态度。加拿大政府除维持原有的能源开发激励政策外，并没有针对页岩气再出台新的产业政策。

二、启示与建议

1. 美国和加拿大页岩气的成功与政府出台的扶持政策密不可分

美国和加拿大政府制定的税收减免政策、市场化准入模式以及管网建设方案等都为页岩气的开发提供了有利条件，大大降低了页岩气开发成本，提升了页岩气盈利空间，为中小型油气开发商提供了公平竞争和商业开发页岩气的机遇。如果我国对页岩气产业的发展出台一定的扶持政策，可在一定程度上减少石油公司页岩气开发的成本压力，使其积极参与非常规能源的开发。

2. 美国页岩气的成功缘于多年的技术积累

美国政府设立基金长期支持技术研发，不但资助政府所属的研究机构，还投入一定的研究经费给中小型技术公司，使页岩气开发技术研发可以在多专业领域内同时开展。我国可以参考美国的经验，设立基金扶持项目，使多数具备实力的科研机构和公司，都可以参与页岩气新型技术的研发。通过多领域技术合作，最终形成一套完整的页岩气开发配套技术。

3. 环境保护成为页岩气开发面临的重要难题

环境保护问题是能源公司开发页岩气面临的风险因素，也为我国制定新的产业政策提出了挑战。目前，美、加等国已出台严厉的环境保护政策，对页岩气开发起到了一定的负面作用，在一定程度上制约了水力压裂等开发技术的广泛应用，一些地区不能以最佳技术开发方案进行页岩气开采，造成钻完井成本增加，经济效益下降。我国出台的页岩气产业政策，应当参考美、加等国的环境保护政策，在保护地下水、减少地面污染的情况下，使页岩气得到经济、有效的开发。

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including the gas to liquids (GTL), liquefied natural gas (LNG) and gas to methanol are analyzed and compared, and route competitiveness is expressed by the ratio of the affordable gas price to the oil price of the project. The results show that, when the oil price is 80 dollars/barrel, the competitiveness of the GTL project and the LNG project for the lubricant program are at the equivalent level and higher, while the competitiveness of the GTL project and the methanol project for the diesel program are significantly lower. Through GTL, the hard linkage between the natural gas price and the crude price will be realized, and the LNG price will stand at the same high level as the oil price. High-grade lubricant base oil produced from GTL projects will impact greatly on the traditional lubricant base oil business. Therefore, Chinese companies should take countermeasures as soon as possible. According to the long-term view, the methanol price will gradually rise and caution should be exercised in the development of methanol to olefin (MTO) projects.

Lessons from US and Canadian shale gas industry policies

By WANG Nan & LEI Danfeng, Research Institute of Petroleum Exploration & Development - Langfang Branch, National Energy Shale Gas R&D (Experiment) Centre; LIU Xingyuan, China Petroleum Materials Corporation; DU Dong, Research Institute of Petroleum Exploration & Development; YANG Jing, Research Institute of Petroleum Exploration & Development-Langfang Branch

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The US and Canadian governments have encouraged unconventional resource development by introducing a series of shale gas support policies. The policies include offering tax credits for shale gas exploration and development, establishing a special fund to support research institutions carrying out technological research, creating a diversified investment environment, and establishing an open market mechanism. These initiatives have significantly reduced the cost of shale gas development and promoted the rapid development of the shale gas industry. In the meantime, the US and Canadian governments have strengthened industry regulation and issued strict environmental policies to protect water resources, fishery resources and wildlife in the operation areas. In this study, a comprehensive analysis of US and Canadian shale gas industry policies has been conducted. It is recommended that our government should draw experiences from shale gas development in North America, where a series of support policies have been introduced. China should establish fund supporting projects, improve shale gas development technologies through technical cooperation, reduce environmental pollution and ensure that shale gas resources are developed effectively and safely.

Condensate oil supply and demand trends and their influence in Asia

By XU Haifeng, CNPC Economics & Technology Research Institute

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In recent years, the development of natural gas projects facilitated the rapid growth of condensate oil production in Asia. In the years to come, condensate oil production in Asia, in particular in the Persian Gulf region, will continue growing and the crude, oil product and natural gas markets of the whole region will be reshaped. Condensate oil, causing a change in the upstream development mechanism of the Middle East and the Asia-Pacific region, is conducive to the development of difficult natural gas projects. The new round of investment in the construction of condensate oil fractionation devices in the Middle East and the Asia-Pacific region will influence the trading flow of naphtha and petrol. South Korea and China will be the source of the growth in condensate oil demand. Condensate oil produced by Russia has started to enter the Asian market. Naphtha is the decisive factor in the condensate oil price level, and crude, petrol and intermediate distillate also have an influence on the sale of condensate oil. The key to determining future condensate oil prices is the capacity of the Asia-Pacific region to absorb increased naphtha from the Middle East and the capacity of India to increase naphtha exports. Oil companies have noticed the change to the condensate oil market and are attempting to grasp opportunities to maximize their benefits. Trading in condensate oil is increasingly becoming an important part of the integration of the global oil trade and the demand and supply balance.

The full text of each article is available in English subject to charge

附件 11

Congressional Research Service
Informing the legislative debate since 1914

Energy Tax Policy: Issues in the 114th Congress

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June 15, 2016

Congressional Research Service
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CRS REPORT
Prepared for Members and
Committees of Congress

Current Status of U.S. Energy Tax Policy[26]

Current U.S. energy tax policy is a combination of long-standing provisions and relatively new incentives. Energy-related tax incentives also support both energy production and consumption. Provisions supporting the oil and gas sector reflect desires for domestic energy production and energy security, long-standing cornerstones of U.S. energy policy. Incentives for renewable energy reflect the desire to have a diverse energy supply, also consistent with a desire for domestic energy security. Incentives for energy efficiency are designed to reduce consumption of energy from all energy sources. Incentives for renewable energy, energy efficiency, and alternative technology vehicles reflect environmental concerns related to the production and consumption of energy using fossil-based resources. **Table 1** contains a current list of energy-related tax expenditures and other energy tax provisions.[27]

Fossil Fuels

There are a number of tax incentives currently available for energy production using fossil fuels. They can be broadly categorized as (1) enhancing capital cost recovery; (2) subsidizing extraction of high-cost fossil fuels; or (3) encouraging investment in non-petroleum or cleaner fossil fuel energy options. Certain incentives are designed to support coal, while others tend to support the oil and gas sector. The fossil fuels related incentives listed in **Table 1** are estimated to reduce federal tax revenues by $21.5 billion between 2015 and 2019.

Among the capital cost subsidies, the allowance of the percentage depletion method is estimated to cost $8.8 billion between 2015 and 2019.[28] Under percentage depletion, a deduction equal to a fixed percentage of the revenue from the sale of a mineral is allowed. Total lifetime deductions, using this method, typically exceed the capital invested in the project. To the extent that percentage depletion deductions exceed project investment, percentage depletion becomes a production subsidy, instead of an investment subsidy. In other words, taxpayers may be able to claim allowances that reduce tax liability even after the cost of investment is fully recovered. Other capital cost recovery provisions include expensing of intangible drilling costs related to exploration and development and a decrease in the amortization period for certain geological and geophysical (G&G) expenditures.[29] The expensing of exploration and development costs is estimated to cost the federal government $7.5 billion in revenue losses over the 2015 through 2019 budget window, while the reduced amortization period for G&G expenditures is estimated to cost $0.7 billion over the same time period.

(...continued)

powered vehicles. Even if the gas tax were to be viewed as one correcting for emissions, it would make more economic sense to tax emissions rather than just those coming from the burning of fossil fuels by motor vehicles.

[26] See also U.S. Congress, Joint Committee on Taxation, *Present Law and Analysis of Energy-Related Tax Expenditures*, committee print, 114th Cong., June 9, 2016, JCX-46-16.

[27] Tax expenditures are government revenue losses attributable to tax provisions that allow for special exclusions, exemptions, or deductions from income or provisions that provide special tax credits, preferential tax rates, of defer tax liability. Technically, excise tax credits are not considered tax expenditures because they do not directly affect income tax liability.

[28] The tax expenditure for percentage depletion is computed by subtracting the value of cost depletion, the standard depletion method, from the value of percentage depletion. The resulting lifetime excess is the tax expenditure.

[29] Expensing costs means to deduct the full cost of an investment in the current tax year, rather than depreciate the costs over a period of time.

附件 12

SEI STOCKHOLM ENVIRONMENT INSTITUTE

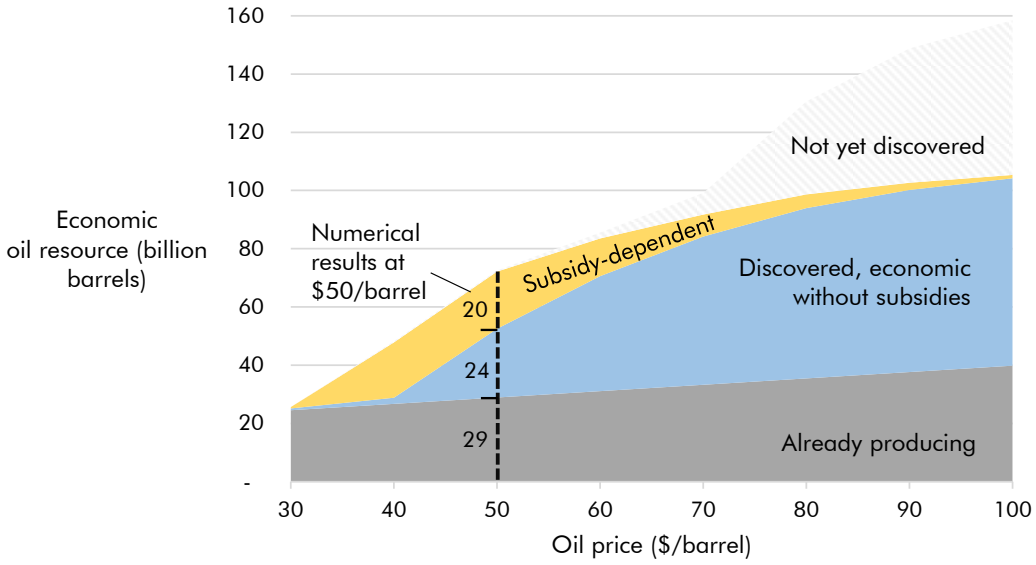
Stockholm Environment Institute, Working Paper 2017-02

Effect of government subsidies for upstream oil infrastructure on U.S. oil production and global CO_2 emissions

Peter Erickson, Adrian Down and Michael Lazarus, Stockholm Environment Institute
Doug Koplow, Earth Track

Among the basins evaluated here, the greatest impact at $100 per barrel would be for offshore Gulf resources. This is because the region has the highest concentration of fields with high break-even costs.

Figure 2: Share of U.S. oil resources that are subsidy-dependent as a function of oil prices



Note: The chart assumes a 10% hurdle rate.

Figure 2 also displays (in grey hatching) Rystad's estimates of the U.S. oil resources that may still be discovered, most of which would cost $70 per barrel or more to develop.[20] These estimates are speculative, so we do not assess the fields' dependence on subsidies in detail here. Still, should they prove as subsidy-dependent as the fields we do assess, the impact of subsidies at higher prices would be larger than we currently estimate.[21]

It is notable that industry dependence on subsidies increases at higher hurdle rates. If investors used a hurdle rate of 15%, rather than the 10% rate used for Figure 2, 25 billion barrels of oil (instead of 20) would be subsidy-dependent at $50 per barrel, and only 5 billion (instead of 23) would proceed anyway. Thus, the total proportion of subsidy-dependent production would rise to more than 80% at a 15% hurdle rate, compared with slightly less than 50% at a 10% hurdle rate. Appendix 1includes a version of Figure 2 using a 15% hurdle rate instead of 10%.

[20] These estimates include Rystad's assessment of the Midland Basin Wolfcamp shale. Recent estimates of that formation by the U.S. Geological Survey (USGS) indicate it could hold 20 billion barrels (https://pubs.er.usgs.gov/publication/fs20163092). This is about 14 billion barrels more than Rystad's (mid-2016) estimate. Should the potential be as the USGS estimates, this could increase the U.S. economic oil resource by about 10%. However, because the USGS still considers these resources *undiscovered*, including them here would not affect our findings on subsidy-dependent, already discovered resources.

[21] For example, should the same amount of oil resource be subsidy-dependent at $100 per barrel (due to new discoveries) as we estimate at $50 per barrel – 20 billion barrels – then 17% of the 120 billion barrels of not-yet-producing oil at $100 per barrel could be subsidy-dependent.

3.3 Effects on oil resources, production and CO_2 emissions

At prices of $50 per barrel, subsidies boost fields into profitability that contain an estimated 20 billion barrels of oil. Table 4 presents the scale of subsidy-dependent oil by basin, both in terms of barrels and as a share of each basin's resource base.

Although the absolute and relative quantities of each basin's subsidy-dependent oil varies, subsidies have a substantial impact in all of them. The impact in terms of barrels of oil is highest in the Permian Basin. The share of each basin's resource that is dependent on subsidies is highest in the Gulf of Mexico.

Table 4: Impact of subsidies on undeveloped oil resources and GHG emissions (at $50/bbl)

Area	Economic oil resources, discovered but not yet producing (billion barrels)	Percent subsidy-dependent	Increase in economic oil resources due to subsidies		Increase in net GHG emissions (Gt CO_2)
			(billion barrels)	(Gt CO_2)	
Williston basin	4.1	59%	2.4	1.0	0.2
Permian basin	20.3	40%	8.0	3.3	0.6
Gulf of Mexico	2.1	73%	1.5	0.6	0.1
Rest of U.S.	16.7	46%	7.6	3.1	0.6
Total U.S.	**43.3**	**45%**	**19.6**	**8.1**	**1.5**

Source: SEI analysis based in part on data from Rystad Energy.

Once burned, the nearly 20 billion barrels of subsidy-dependent oil would release about 8 billion tonnes (Gt) CO_2, as is also indicated in Table 4.[22]

Some further context on the relative scale of these emissions is helpful. The Intergovernmental Panel on Climate Change (IPCC) has estimated that if society is going to maintain even a two-thirds chance of limiting warming to the internationally agreed goal of 2°C (Clarke et al. 2014),[23] net global emissions from 2016 onward cannot exceed 840 Gt CO_2. In that context, the decision by the U.S. federal and state governments to continue subsidizing oil investment could produce oil that, once burned, will produce CO_2 emissions equivalent to about 1% of the remaining *global* carbon budget that all sectors of all economies.

It can also be helpful to compare this added production to the amount of oil that the U.S. might produce in a 2°C-consistent scenario. Some researchers have explored this question, using models that minimize the cost of meeting the global budget (McGlade and Ekins 2015; IEA

[22] We use "tonnes" to denote metric tons. To estimate CO_2 emissions, we use Rystad's assumed energy content of 5.51 MMBtu/ barrel and apply standard carbon contents of crude oil of 20.31 kg C / MMBtu from the EPA's national greenhouse gas inventory (U.S. EPA 2014).

[23] Here, we adjust the IPCC's 990 Gt CO_2 budget from 2012 to 2100 (IPCC 2013) by the CO_2 emissions that have been released in the four years since, or 150 Gt CO_2.

附件 13

Impacts of delaying IDC deductibility (2014-2025)

Released – July, 2013

Wood Mackenzie
consulting

Wood Mackenzie onshore/offshore split of tangibles and IDCs

- We tend to see a higher percentage of intangible costs in offshore wells
  - Driven by rig rates for offshore wells which are typically higher than onshore
- However unconventional onshore wells (i.e. shale gas and oil) require fracture stimulation once the rig has been removed, thus increasing the percentage of intangibles in these wells
  - For such wells, completion costs including fracture stimulation can be the largest single intangible cost item – greater than the cumulative day rate

	Offshore Drilling	Onshore Conventional Drilling	Onshore Unconventional Drilling
Intangibles as a typical % of total well cost	80%	70%	85%
Tangibles as a typical % of total well cost	20%	30%	15%

附件 14

美国化石燃料补贴自述报告

2015年12月向G20同行审议小组提交

目 录

This is an unofficial Chinese translation of the official English self-report. Should there be any differences, the English version is the authoritative version.

本报告为官方英文自述报告的非官方中文翻译。如有不同，以英文报告为权威版本。

第一部分：生产者补贴

在美国有下述几种针对化石燃料生产者的有效条款。美国政府一共确定了 16 条联邦政府层面的化石燃料生产环节税收条款。这份清单包括了之前美国政府提交给 G-20 化石燃料补贴进展报告中确定的 11 项联邦政府税收条款，以及在中美化石燃料补贴改革同行审议进程中通过自评新增的 5 项条款。

1. 扣除无形钻井成本

成本/年：16.29 亿美元[1]（数据来自 2016 财年预算中期评估）

目标化石燃料：石油、天然气

补贴描述：对于纳税人因开发其位于美国境内的油气田而产生的无形钻井成本（IDCs），纳税人可选择在成本支付或发生的当年进行成本扣除（即费用化，可以不进行资本化）。选择扣除无形钻井成本的综合性石油公司，其生产用井的无形钻井成本的 30%必须予以资本化（计入资产的成本，而不是在当期直接作为成本扣除），并在之后的 60 个月中进行摊销。

补贴分析：允许对无形钻井成本扣除的条款给石油和天然气行业提供了税收优惠。无形钻井成本资本化的规定旨在使石油和天然气行业与其他行业适用类似的成本回收系统，从而减少该项政策对经济的扭曲。正如本届提议废除的石油和天然气行业的其他优惠条款一样，无形钻井成本扣除条款会扭曲市场，会鼓励比在一个中性的税收制度下更多的资本进入石油和天然气行业。该市场扭曲不利于维护国家的长期能源安全，与政府支持清洁能源经济发展的政策不相符，而发展清洁能源经济有助于减少对石油的依赖，降低温室气体的排放量。此外，因对石油和天然气行业提供税收优惠而减少的财政收入最终将由对其他行业征收的税款来弥补，而这些行业原本可能会创造出更多的经济价值，却因为缺少税收优惠政策而面临投资不足的问题。

废止建议：根据政府 2016 财年预算提案，无形钻井成本扣除的政策以及综合性石油公司无形钻井成本的 30%应当予以资本化并在之后的 60 个月中进行摊销的

[1]除上市合伙企业的优惠政策成本数据之外，美国财政部对其他所有的优惠政策成本数据负责。美国财政部假设补贴将自 2015 年 12 月 31 日起废止，根据现行法律规定和拟于 2016-2025 财政年度期间进行的政策调整分别计算联邦政府税收收入，根据两者的差额来测算优惠政策的年均成本。上市合伙企业的优惠政策成本按如下方式测算：假设拟定于 2020 年 12 月 31 日之后进行的政策调整会生效，在 2021-2025 财政年度期间按新旧政策分别计算联邦政府税收收入，根据两者的差额来测算其优惠政策的年均成本。

政策将被废止。根据成本与收入相配比的原则，无形钻井成本将全部资本化，随着开采的进程进行摊销。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

2.按比率计算油井和天然气井的折耗额

成本/年：9.66 亿美元（数据来自 2016 财年预算中期评估）

目标化石燃料：石油、天然气

补贴描述：折耗额适用于任何在油气财产中享有经济利益的个人。通常有两种计算折耗额的方法：按成本和按比率计算折耗额。按成本计算折耗额的方法受纳税人财产计税基础的限制，按比率计算折耗额的方法虽然不受计税基础的限制，但是会受到其他制约。

按比率（15%）计算油气井折耗额的方法只适用于独立生产者和特许权所有者，并且上述独立生产者和特许权所有者的日均石油产量不得超过 1000 桶/天，日均天然气产量不得超过 1000 桶石油的天然气当量。除此之外，按比率计算折耗额的方法还不得超过以下两个数额中的较小值：不包含免税折耗额的应纳税所得额的 65%，不包含免税折耗额且与财产相关的应纳税所得额的 100%。

补贴分析：与按成本计算财产折耗额的方法相比，按比率计算财产折耗额的方法能够实现更高的税后收入，相当于给纳税人提供了一个较低的税率。根据纳税人财产的计税基础，按成本计算财产折耗额，符合收入与费用相配比的原则，使化石燃料行业适用与其他行业类似的政策，有利于减少对经济的扭曲。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据本届政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度起，按比率计算油井折耗额和天然气井折耗额的政策将被废止。纳税人可以根据其财产的计税基础按成本计算财产折耗额。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

3.境内生产化石燃料费用扣除额

成本/年：10.49 亿美元（数据来自 2016 财年预算中期评估）

目标化石燃料：石油、天然气、煤炭、褐煤、油页岩

补贴描述：进行境内制造和生产活动所取得的所得可进行一定的扣除。自 2009 年之后的纳税年度起，按纳税年度符合条件的生产活动所得和应纳税所得额这两者中较小值的 9%计算扣除额，但该扣除额不得超过 W-2 表格所记录的纳税人在纳税年度所得额的 50%。从事石油和天然气生产所取得的所得可以按照 6%计算费用扣除额。

该项纳税扣除被广泛使用，并不仅针对化石燃料行业。

补贴分析：生产活动扣除普遍适用于纳税人取得的所有符合条件的生产活动所得，给包括化石燃料生产在内的特定经济活动有效地提供了一个更低的税率。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度起，销售、交换和处置石油、天然气或煤炭及其他固体矿物化石燃料等一次能源产品取得的收入，不再适用上述纳税扣除政策。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

4.地测和物探费用支出可在 2 年内摊销

成本/年：2.88 亿美元（2016 财年预算中期评估）

目标化石燃料：石油、天然气

补贴描述：独立石油公司[2]从事境内石油和天然气开采而发生的地测和物探费用可以在 2 年内进行摊销。综合性石油公司从事境内石油和天然气开采而发生地测和物探费用则必须在 7 年内进行摊销。

补贴分析：上述地测和物探费用的加速摊销政策给石油和天然气行业的独立石油公司提供了税收优惠。将石油和天然气行业独立石油公司的地测和物探费用

[2]译注：综合性石油公司一般是指综合进行油气勘探、开采、炼油、分销等多种油气经营活动的企业；独立石油公司在这里应是指专门从事油气开采的企业。

摊销期从 2 年延长至 7 年有利于更准确地反映其收入水平，对所有石油和天然气石油公司一视同仁，有利于营造一个更公平的税收环境。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，所有石油和天然气石油公司从事境内石油和天然气开采而发生的地测和物探费用将统一按 7 年进行摊销。提前报废的财产不再摊销，已弃置的财产恢复使用的，其账面价值应在剩余期限内摊销（总摊销期以 7 年为限）。新政策将自 2015 年 12 月 31 日之后的纳税年度起生效。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

5.按比率计算与固体矿物化石燃料相关的财产折耗额

成本/年：2.09 亿美元（数据来自 2016 财年预算中期评估）

目标化石燃料：煤炭、褐煤、页岩油

补贴描述：与煤炭和褐煤相关的财产按 10%的比率计算其折耗额，与页岩油相关的财产按 15%的比率计算其折耗额。当计算出的财产折耗额大于该财产经调整后的计税基础时，不再适用上述 10%、15%的折耗额计算标准，而是按照替代性最低税（AMT）的要求，按 20%的税率计算所得税。同时，计算的折耗额也不得超过矿产年净所得的 50%。

补贴分析：与按成本计算财产折耗额的方法相比，按比率计算财产折耗额的方法能够实现更高的税后收入，相当于给纳税人提供了一个较低的税率。按成本计算每期的财产折耗额，符合收入与费用相配比的原则，使化石燃料行业适用与其他行业相同的政策，有利于减少对经济的扭曲。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止描述：根据政府 2016 财年预算提案，与煤炭和其他固体矿物化石燃料相关的财产不再适用按比率计算折耗额的政策。与褐煤和油页岩相关的财产也不再适用按比率计算折耗额的政策。纳税人如果拥有与煤炭和其他固体矿物化石燃料相关的财产，应根据其经过调整后的计税基础，按成本计算折耗额。自 2015 年 12 月 31 日之后的纳税年度起，与固体矿物化石燃料相关的财产按新政策计算折耗额。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

6.扣除固体矿物燃料的勘探和开发费用

成本/年：5300 万美元（数据来自 2016 财年预算中期评估）

目标化石燃料：煤炭、褐煤、油页岩

补贴描述：矿业公司可选择将其境内发生的勘探和开发费用的 70%在当期进行扣除。剩余的 30%不得抵扣，应予以资本化并在 60 个月内摊销。纳税人也可以选择将所有的勘探和开发费用资本化并在 10 年内摊销。当存在替代性最低税（AMT）的限制时，纳税人勘探和开发费用的两种不同核算方式并不属于税收优惠。

补贴分析：扣除煤炭和其他固体矿物燃料勘探和开发费用的政策给这些化石燃料行业提供了税收优惠。将上述勘探和开发费用资本化符合收入与费用配比的原则，有利于税收公平，有利于减少对经济的扭曲。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，美国将废止上述一些列政策，即煤炭和其他固体矿物燃料勘探和开发费用的 70%可以在当期扣除，剩余 30%应予以资本化并在之后的 60 个月内摊销；煤炭和其他固体矿物燃料勘探和开发费用全部予以资本化并在之后的 10 年内摊销。新政策规定，矿业公司发生的勘探和开发费用应全部予以资本化，根据收入与费用相配比的原则，在经营期内合理计提折旧或进行摊销。褐煤和页岩油的勘探和开发费用也适用同样的政策调整。自 2015 年 12 月 31 日之后的纳税年度起，发生或支付的勘探和开发费用适用新政策。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

7.煤炭权利金适用资本利得的税务处理

成本/年：3100 万美元（数据来自 2016 财年预算中期评估）

目标化石燃料：煤炭、褐煤

补贴描述：在煤矿被开采之前，纳税人已拥有该煤矿一年以上，其转让煤矿开采经营权取得的权利金收入通常满足长期资本利得的确认条件。权利金收入在下列情况中不应作为长期资本利得：转让煤矿开采经营权是以投机为目的；权利金收入归属于合伙人、委托人；转让煤矿开采经营权的行为属于关联方交易。

补贴分析：将转让煤矿开采经营权取得的符合条件的权利金收入视同长期资本利得的政策给相关化石燃料行业提供了税收优惠。对这部分权利金收入采用与其他行业权利金收入无差别的政策有利于减少对经济的扭曲。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度起，转让煤矿开采经营权取得的权利金收入将不再被认定为长期资本利得，同时将作为一般性收入进行纳税。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

8.三次采油费用扣除

成本/年：1000 万美元（数据来自 2016 财年预算中期评估）

目标化石燃料：石油

补贴描述：纳税人开采石油时，为提高原油采收率而运用三次采油技术所发生的费用，如果符合条件，通常可以在计算应纳税所得额时扣除。

补贴分析：由于三次采油费用可以在发生的当期直接扣除而无需资本化，所以三次采油扣除给石油和天然气行业提供了税收优惠。将三次采油费用资本化有利于税收公平，使石油和天然气行业适用与其他行业同样的税收待遇，有利于减少对经济的扭曲。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，在 2015 年 12 月 31 日之后的纳税年度起，发生或支付的三次采油费用不再享受当期扣除的优惠政策。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

9.对油气财产享有经营权益而发生的被动损失的特殊性税务处理

成本/年：1900 万美元（数据来自 2016 财年预算中期评估）

目标化石燃料：石油、天然气

补贴描述：通常情况下，被动损失在抵减被动所得之后若还有剩余，则只能结转至以后年度继续抵减被动所得。企业因对油气财产享有经营权益而发生的被动损失可以抵减积极所得。只有当纳税人以不限制纳税义务的方式取得油气财产经营权益时，才适用上述特殊性税务处理。

补贴分析：对油气财产经营权益的特殊性税务处理给石油和天然气行业提供了税收优惠。限制这种特殊性税务处理有利于税收公平，使石油和天然气行业的被动损失适用与其他被动损失同样的税收待遇，有利于减少对经济的扭曲。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据本届政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度起，对油气财产享有经营权而发生的被动损失不再适用特殊性税务处理。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

10.提高石油采收率（EOR）的税收抵免

成本/年：0（数据来自 2016 财年预算中期评估）

目标化石燃料：石油

补贴描述：在美国为提高石油采收率的项目所发生开支的 15%可以在应纳企业所得税中进行抵免。提高石油采收率的项目是指通过运用一种或多种三次采油技术来显著提高可采原油量的项目。

若石油的参考价格超过根据通货膨胀指数进行相应调整后的法定额度，该项税收优惠政策失效。

补贴分析：该项抵免政策给石油和天然气行业提供了税收优惠。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据本届政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度起，为提高石油采收率而发生的支出将不再享受税收抵免优惠政策。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

11.边际井抵免

成本/年：0（数据来自 2016 财年预算中期评估）

目标化石燃料：石油、天然气

补贴描述：边际井和日均产量不超过 3 桶/天的油井的产出可以享受税收抵免政策。

若石油或液体燃料的参考价格超过根据通货膨胀指数进行相应调整后的法定额度，将不再执行该税收优惠政策。

补贴分析：该项抵免政策给石油和天然气行业提供了税收优惠。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度起，从边际井开采的石油和天然气将不再享受税收抵免优惠政策。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

12.免除化石燃料行业上市合伙企业的企业所得税

成本/年：3.42 亿美元（数据来自 2016 财年预算中期评估）

目标化石燃料：石油、天然气、煤炭

补贴描述：上市合伙企业一般需要缴纳企业所得税。当上市合伙企业的总收入有 90%以上来自非再生资源、房地产和大宗商品领域时，该上市合伙企业可免缴企业所得税，在税法上视同普通合伙企业缴税，即合伙企业可以将其所有的收入、利得、损失、扣除、抵免在合伙人之间分摊，合伙人以其享有的份额来承担所得税纳税义务（或从损失弥补中获益[3]）。

[3] 译注：在有收益的情况下，合伙人只需要缴纳个人所得税；在亏损的情况下，合伙人可以冲抵其他收入，从而使合伙人承担较低的个人所得税。

补贴描述：该项免税政策给石油和天然气行业提供了税收优惠。有关化石燃料税收优惠政策的影响分析详见扣除无形钻井成本的优惠政策分析。

废止建议：根据政府 2016 财年预算提案，对上市合伙企业从事与化石燃料有关的经营而取得的符合条件的收入和利得免征企业所得税的政策将被废止，这类企业自 2020 年 12 月 31 日之后的纳税年度起，将被视同 C 类公司缴纳企业所得税。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

13.免除从焦油砂中提炼出的原油的消费税

成本/年：5200 万美元（数据来自 2016 财年预算）

目标燃料：从沥青和焦油砂中提炼出的原油。

补贴描述：美国对以下燃料的使用征收消费税：（1）美国炼油厂获取的原油；（2）进口的石油产品（包括原油）；（3）所有在境内使用或向境外出口的尚未承担任何税收的境内生产的原油和天然气（用于石油和天然气开采的除外）。具体税率为：在 2017 年 1 月 1 日之前，9 美分/桶；2016 年 12 月 31 日之后，8 美分/桶。在税法上，从沥青和焦油砂中提炼出的原油不同于普通的原油和石油产品。征收的消费税专款专用，通过成立溢油责任信托基金（OSLTF，Oil Spill Liability Trust Fund）来补偿除油支出，弥补石油泄漏所造成的损失，同时每年给特定的机构提供资金支持，用于其对石油污染预防和应对方案的研究。

补贴分析：该项免税政策是对从焦油砂中提炼出的原油的税收优惠。

废止建议：根据政府 2016 财年预算提案，自 2015 年 12 月 31 日之后的纳税年度，将上述消费税的减免范围扩大到所有从沥青沉积物中提炼的原油。

废止实施：美国国会必须通过法案，为此项建议立法。

主管机关：美国财政部

14.有益使用燃料可免除权利金

成本/年：平均每年损失权利金收入 3900 万美元[4]

目标化石燃料：主要为天然气，可能涉及石油

补贴描述：在开采租约上明确其对碳氢化合物的使用是“有益”的，可使陆上和海上石油和天然气公司获得权利金的免除。这些“有益”的使用包括：钻机发动机消耗的燃料，为提高收采率而消耗的燃料，用于设备升降和加热目的的燃料以及压缩石油和天然气而消耗的燃料。

补贴分析：因免除“有益”的燃料使用所对应的权利金而减少的政府收入由美国公众来承担。

废止建议：美国土地管理局（BLM）正在起草一项建议规则，旨在重新规定陆上设备有利地消耗石油和天然气的情形，从而缩小该项优惠政策的适用范围。海上设备有利地消耗燃料的情形也可能会作出类似的调整。

废止实施：这项建议规则原定于 2016 年初颁布，最终条例预计在 2016 年 5 月发布。制定政策是美国土地管理局（BLM）的一项首要工作。

主管机关：美国内政部

15.燃烧和排放天然气免收权利金

成本/年：每年估计平均损失权利金收入 7000 万美元

目标化石燃料：天然气

补贴描述：石油和天然气公司从事陆上联邦石油和天然气开采时，在下述情况下排放/燃烧的石油和天然气无需承担权利金：测试、处理紧急事件以及由于储存和运输等基础设施的缺位使得天然气进入市场获取的收益无法补偿其成本的

“有益使用燃料可免除权利金”和“燃烧和排放天然气免收权利金”这两项优惠政策的年成本按如下方式测算：天然气数据*开采每千立方英尺气体燃料所支付的年均权利金，其中天然气数据是指“有利”的气体燃料使用和经美国土地管理局（BLM）或美国安全和环境执法局（BSEE）批准的作为不可避免损失而燃烧或排放的气体燃料，开采气体燃料是指各州在 2006-2013 销售年度的气体燃料开采。开采每千立方英尺气体燃料所支付的年均权利金根据 ONRR（ “有利”的气体燃料使用和经美国土地管理局或美国安全和环境执法局批准的作为不可避免损失而燃烧或排放的气体燃料）的销售量和上述部门网站上有关支付的权利金的统计数据计算得出。如果对上述燃料用量征收权利金，则油井和气井的作业者将会有动力减少其排放或燃烧的燃料，因此这里的测算值是一个上限值。

时候。除此之外，石油和天然气公司应当就其开采的所有天然气支付权利金，无论这些天然气是被燃烧/排放或用于销售。对于海上石油和天然气开采活动，美国安全和环境执法局（BSEE）规定，平均每天加工 2000 桶以上石油的设施必须安装燃烧/排放测量仪。为了防止政府收入流失，美国安全和环境执法局还规定了不得免除权利金的情形。比如基于经济考虑，没有免除海上排放/燃烧的天然气权利金的规定。

补贴分析：免除石油和天然气公司符合条件的权利金而减少的政府收入由美国公众来承担。

废止建议：美国土地管理局（BLM）正在起草一项针对天然气燃烧/排放的建议规则，旨在通过确立一套标准来限制因燃烧/排放陆上天然气而导致的浪费，旨在使联邦领土和印第安人保留地上的石油和天然气生产设施所耗费的天然气最少，旨在建立区分可避免损失与不可避免损失的标准。

废止实施：这项建议规则原定于 2016 年初颁布，最终条例预计在 2016 年 5 月发布。制定政策是美国土地管理局（BLM）的一项首要工作。

主管机关：美国内政部

16.破坏自然资源的赔偿限额

成本/年：无法做出准确测算。由于相关责任方支付的溢油污染清理费用至今均未发生超过赔偿限额的情形，因此尚未有责任方从该项条款中受益。

目标化石燃料：主要是石油，可能涉及天然气

补贴描述：美国 1990 年通过的《石油污染法案》（OPA）要求责任方支付溢油污染清理费用，用于私有经济和公共天然资源的索赔，以 7500 万美元为最高限额（发生重大过失导致的污染不受此限额的限制）。除了墨西哥海湾“深水地平线”（Deepwater Horizon）近海钻井油田爆炸事件之外，企业支付的所有溢油污染清理费用至今尚且没有超过 7500 万美元限额的，因此该法案至今未被援引。在墨西哥海湾“深水地平线”近海钻井油田一案中，法庭判定钻井平台的操作存在重大过失，而重大过失所导致的溢油污染不适用上述《石油污染法案》。所以“深水地平线”金海钻井油田爆炸所导致的溢油污染不以 7500 万美元为赔付限额。

补贴分析：石油公司应支付的溢油污染清理费用超过 7500 万美元的部分实际上由美国公众来分担。

废止建议：目前该赔偿限额是由成文法规定的，并且只有在消费者价格指数（CPI）上升幅度很大时才能进行相应的调整。美国海洋能源管理局（BOEM）被授权调整上述赔偿限额，使其不受通过膨胀的影响。未来，美国海洋能源管理局将会每三年根据通货膨胀的影响来相应调整该赔偿限额。

废止实施：2014 年 12 月 11 日，美国海洋能源管理局宣布将海上石油和天然气设施的溢油污染赔偿限额从 7500 万美元提高到 1.34 亿美元。该项提高溢油污染赔偿限额的举措与全国委员会就英国石油公司（BP）“深水地平线”近海钻井油田爆炸事件的研究建议和其他相关机构的研究建议相一致，也是《石油污染法案》所允许提高的最大幅度。1.34 亿美元的赔偿限额适用于在联邦和州海岸线向海海域内开采石油和天然气的设施所造成的溢油污染，该条款同时也包含这样一种机制，即赔偿限额可以根据未来消费者价格指数（CPI）的变化而做相应调整，反映通货膨胀产生的影响。

主管机关：美国内政部

第二部分: 消费者补贴

美国有一项由联邦政府提供资金支出的消费者补贴。该补贴针对低收入家庭，符合条件的家庭，根据其家庭水电费账单的金额可以得到一笔数额客观的返还。由于该计划是一项有针对性的转移支付，旨在帮助低收入家庭获得基本的能源服务，所以并不会鼓励浪费性的能源消费，因此该计划不是低效的。

1. 低收入家庭能源补助计划（LIHEAP）

成本/年： 34 亿美元（来源于 2016 财年数据）

补贴描述：以整笔拨款的形式酌情发放给各州、各领区、各部落以及各部落组织，用于保障低收入家庭冬季取暖和夏季降温的需求。领取到该笔拨款的政府机构或组织等，可以将该笔基金的一部分投放在低收入家庭的房屋节能翻修工程以及与该计划有关的行政管理工作中。联邦政府规定，当家庭收入超过贫困家庭收入标准的 150%或家庭所在州的中等收入水平的 60%时，将不再享受该项能源补助计划。在 2012 财政年度，低收入家庭能源补助计划的供暖补助（包括冬季取暖补助以及针对冬季恶劣天气的补助）平均为 587 美元/户，相当于享受该项补助计划的低收入家庭平均取暖支出的 63.7%。

补贴分析：低收入家庭能源补助计划针对有老人，残疾人和孩子的家庭以及收入无法满足其基本用能需求的贫困家庭。这部分家庭取暖和降温的能源需求如果无法得到满足，将面临严重的健康风险和安全风险。在 2012 财政年度，在享受低收入家庭能源补助计划的家庭中，有老人的家庭占比 32%，有残疾人的家庭占比 35%，有 5 岁以下儿童的家庭占比 21%。通过加权平均，享受到取暖补助的家庭其能源负担率为 12%，所有低收入家庭的同期能源负担率为 9%。

政策的杠杆效应：低收入家庭能源补助计划带动了各州、各领区、各部落以及各部落组织与能源相关的其他补助，诸如：更低的水电费用，房屋节能翻修获得的补助，电话费折扣以及其他私人和公共领域的补助。在 2010 财政年度，低收入家庭能源补助计划拨款带动的其他相关私人和公共领域的补助共计 29.96 亿美元。

废止建议：该计划原定于 2007 年底废除，但是国会通过法案使政策得以延续，每年继续提供拨款。本届政府并不建议废除这项针对于低收入家庭的能源补助计划。

主管机关：美国健康与公共事业部（HHS）

附件 15

FISCAL YEAR 2019

EFFICIENT, EFFECTIVE, ACCOUNTABLE

AN AMERICAN BUDGET

ANALYTICAL PERSPECTIVES

BUDGET OF THE U.S. GOVERNMENT

OFFICE OF MANAGEMENT AND BUDGET | OMB.GOV

Table 13–4. PRESENT VALUE OF SELECTED TAX EXPENDITURES FOR ACTIVITY IN CALENDAR YEAR 2017

(In millions of dollars)

	Provision	2017 Present Value of Revenue Loss
5	Deferral of income from controlled foreign corporations (normal tax method)	63,630
7	Expensing of research and experimentation expenditures (normal tax method)	3,390
22	Credit for holding clean renewable energy bonds	0
9	Expensing of exploration and development costs - fuels	740
36	Expensing of exploration and development costs - nonfuels	40
40	Expensing of multiperiod timber growing costs	110
45	Expensing of certain multiperiod production costs - agriculture	50
44	Expensing of certain capital outlays - agriculture	30
50	Expensing of reforestation expenditures	20
66	Accelerated depreciation on rental housing	14,080
77	Depreciation of buildings other than rental	–5,300
78	Accelerated depreciation of machinery and equipment	27,200
78	Expensing of certain small investments (normal tax method)	1,320
105	Credit for holders of zone academy bonds	160
65	Credit for low-income housing investments	9,120
102	Qualified tuition programs	3,990
144	Defined benefit employer plans	29,729
145	Defined contribution employer plans	79,310
146	Exclusion of IRA contributions and earnings	1,600
146	Exclusion of Roth earnings and distributions	5,300
146	Exclusion of non-deductible IRA earnings	500
148	Exclusion of contributions and earnings for Self-Employed plans	5,480
165	Exclusion of interest on public-purpose bonds	16,520
	Exclusion of interest on non-public purpose bonds	4,260
170	Deferral of interest on U.S. savings bonds	260

tax method is that all R&E expenditures are successful and have an expected life of five years.

8. ***Credit for increasing research activities.***—The baseline tax system would uniformly tax all returns to investments and not allow credits for particular activities, investments, or industries. In contrast, the Tax Code allows an R&E credit of up to 20 percent of qualified research expenditures in excess of a base amount. The base amount of the credit is generally determined by multiplying a "fixed-base percentage" by the average amount of the company's gross receipts for the prior four years. The taxpayer's fixed base percentage generally is the ratio of its research expenses to gross receipts for 1984 through 1988. Taxpayers can elect the alternative simplified credit regime, which equals 14 percent of qualified research expenses that exceed 50 percent of the average qualified research expenses for the three preceding taxable years.

Energy

9. ***Expensing of exploration and development costs, fuels.***—Under the baseline tax system, the costs of exploring and developing oil and gas wells and coal mines or other natural fuel deposits would be capitalized and then amortized (or depreciated) over an estimate of the economic life of the property. This insures that the net income from the well or mine is measured appropriately each year.

In contrast to this treatment, current law allows immediate deduction, i.e. expensing, of intangible drilling costs for successful investments in domestic oil and gas wells (such as wages, the cost of using machinery for grading and drilling, and the cost of unsalvageable materials used in constructing wells). Current law also allows immediate deduction of eligible exploration and development costs for domestic coal mines and other natural fuel deposits. Because expensing allows recovery of costs sooner, it is more generous for the taxpayer than amortization. Expensing provisions for exploration expenditures apply only to properties for which a deduction for percentage depletion is allowable. For oil and gas wells, integrated oil companies may deduct only 70 percent of intangible drilling costs and must amortize the remaining 30 percent over five years. Non-integrated oil companies may expense all such costs.

10. ***Excess of percentage over cost depletion, fuels.***—The baseline tax system would allow recovery of the costs of developing certain oil, gas, and mineral fuel

properties using cost depletion. Cost depletion is similar in concept to depreciation, in that the costs of developing or acquiring the asset are capitalized and then gradually reduced over an estimate of the asset's economic life, as is appropriate for measuring net income.

In contrast, the Tax Code generally allows independent fuel producers and royalty owners to take percentage depletion deductions rather than cost depletion on limited quantities of output. Under percentage depletion, taxpayers deduct a percentage of gross income from fossil fuel production. In certain cases the deduction is limited to a fraction of the asset's net income. Over the life of an investment, percentage depletion deductions can exceed the cost of the investment. Consequently, percentage depletion offers more generous tax treatment than would cost depletion, which would limit deductions to an investment's cost.

11. ***Exception from passive loss limitation for working interests in oil and gas properties.***—The baseline tax system accepts current law's general rule limiting taxpayers' ability to deduct losses from passive activities against nonpassive income (e.g., wages, interest, and dividends). Passive activities generally are defined as those in which the taxpayer does not materially participate, and there are numerous additional considerations brought to bear on the determination of which activities are passive for a given taxpayer. Losses are limited in an attempt to limit tax sheltering activities. Passive losses that are unused may be carried forward and applied against future passive income.

An exception from the passive loss limitation is provided for a working interest in an oil or gas property that the taxpayer holds directly or through an entity that does not limit the liability of the taxpayer with respect to the interest. Thus, taxpayers can deduct losses from such working interests against nonpassive income without regard to whether they materially participate in the activity.

12. ***Capital gains treatment of royalties on coal.***—The baseline tax system generally would tax all income under the regular tax rate schedule. It would not allow preferentially low tax rates to apply to certain types or sources of income. For individuals, tax rates on regular income vary from 10 percent to 39.6 percent (plus a 3.8-percent surtax on high income taxpayers), depending on the taxpayer's income. In contrast, current law allows capital gains realized by individuals to be taxed at a preferentially low rate that is no higher than 20 percent (plus the 3.8-percent surtax). Certain sales of coal under royalty contracts qualify for taxation as capital gains rather than ordinary income, and so benefit from the preferentially low 20 percent maximum tax rate on capital gains.

13. ***Exclusion of interest on energy facility bonds.***—The baseline tax system generally would tax all income under the regular tax rate schedule. It would not allow preferentially low (or zero) tax rates to apply to certain types or sources of income. In contrast, the Tax Code allows interest earned on State and local bonds used to finance construction of certain energy facilities to be exempt from tax. These bonds are generally subject to the State private-activity-bond annual volume cap.

14. ***Enhanced oil recovery credit.***—A credit is provided equal to 15 percent of the taxpayer's costs for enhanced oil recovery on U.S. projects. The credit is reduced in proportion to the ratio of the reference price of oil for the previous calendar year minus $28, adjusted for inflation from 1990, to $6.

15. ***Energy production credit.***—The baseline tax system would not allow credits for particular activities, investments, or industries. Instead, it generally would seek to tax uniformly all returns from investment-like activities. In contrast, the Tax Code provides a credit for certain electricity produced from wind energy, biomass, geothermal energy, solar energy, small irrigation power, municipal solid waste, or qualified hydropower and sold to an unrelated party. Wind facilities must have begun construction before January 1, 2020. Facilities that begin construction in 2017 receive 80 percent of the credit, facilities that begin construction in 2018 receive 60 percent of the credit, and facilities that begin construction in 2019 receive 40 percent of the credit. Qualified facilities producing electricity from sources other than wind must begin construction before January 1, 2017. In addition to the electricity production credit, an income tax credit is allowed for the production of refined coal for facilities placed in service before January 1, 2012. The Tax Code also provided an income tax credit for Indian coal facilities. The Indian coal facilities credit expired on December 31, 2016.

16. ***Marginal wells credit.***—A credit is provided for crude oil and natural gas produced from a qualified marginal well. A marginal well is one that does not produce more than 1,095 barrel-of-oil equivalents per year, with this limit adjusted proportionately for the number of days the well is in production. The credit is no more than $3.00 per barrel of qualified crude oil production and $0.50 per thousand cubic feet of qualified natural gas production. The credit for natural gas is reduced in proportion to the amount by which the reference price of natural gas at the wellhead for the previous calendar year exceeds $1.67 per thousand cubic feet and is zero for a reference price that exceeds $2.00. The credit for crude oil is reduced in proportion to the amount by which the reference price of oil for the previous calendar year exceeds $15.00 per barrel and is zero for a reference price that exceeds $18.00. All dollar amounts are adjusted for inflation from 2004.

17. ***Energy investment credit.***—The baseline tax system would not allow credits for particular activities, investments, or industries. Instead, it generally would seek to tax uniformly all returns from investment-like activities. However, the Tax Code provides credits for investments in solar and geothermal energy property, qualified fuel cell power plants, stationary microturbine power plants, geothermal heat pumps, small wind property and combined heat and power property. A temporary credit of up to 30 percent is available for certain qualified property placed in service before January 1, 2017. For solar energy, a temporary credit is available for property for which construction begins before January 1, 2022, and which is placed in service before January 1, 2024. The credit is 30 percent for property that begins construction

Table 13–1. ESTIMATES OF TOTAL INCOME TAX EXPENDITURES FOR FISCAL YEARS 2017-2027

(In millions of dollars)

		Total from corporations and individuals											
		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2018–2027
National Defense:													
1	Exclusion of benefits and allowances to armed forces personnel	12,400	12,830	11,640	11,680	12,040	12,520	13,040	13,590	14,190	14,820	15,490	131,840
International affairs:													
2	Exclusion of income earned abroad by U.S. citizens	6,600	6,930	7,280	7,640	8,020	8,420	8,840	9,290	9,750	10,240	10,750	87,160
3	Exclusion of certain allowances for Federal employees abroad	1,370	1,430	1,510	1,580	1,660	1,740	1,830	1,920	2,020	2,120	2,230	18,040
4	Inventory property sales source rules exception	3,320	3,570	3,840	4,170	4,480	4,760	5,070	5,410	5,780	6,180	6,640	49,900
5	Deferral of income from controlled foreign corporations (normal tax method)	107,200	112,560	118,190	124,100	130,310	136,820	143,660	150,850	158,390	166,310	174,620	1,415,810
6	Deferred taxes for financial firms on certain income earned overseas	16,080	16,880	17,730	18,620	19,550	20,520	21,550	22,630	23,760	24,950	26,190	212,380
General science, space, and technology:													
7	Expensing of research and experimentation expenditures (normal tax method)	8,330	8,340	9,140	10,100	10,910	11,640	12,310	13,040	13,820	14,660	15,540	119,500
8	Credit for increasing research activities	11,500	12,250	13,010	13,820	14,680	15,600	16,580	17,630	18,730	19,900	21,140	163,340
Energy:													
9	Expensing of exploration and development costs, fuels	–650	–290	–30	120	200	260	290	290	300	350	370	1,860
10	Excess of percentage over cost depletion, fuels	440	550	600	640	700	830	990	1,110	1,210	1,360	1,510	9,500
11	Exception from passive loss limitation for working interests in oil and gas properties	20	20	20	20	20	30	30	30	30	30	30	260
12	Capital gains treatment of royalties on coal	140	160	150	140	150	150	160	160	170	180	190	1,610
13	Exclusion of interest on energy facility bonds	10	10	10	10	10	10	10	30	30	30	30	180
14	Enhanced oil recovery credit	270	350	400	450	440	460	500	530	510	490	440	4,570
15	Energy production credit [1]	1,590	2,230	2,870	3,430	3,880	4,280	4,600	4,790	4,850	4,750	4,440	40,120
16	Marginal wells credit	70	110	70	30	30	40	100	140	180	210	230	1,140
17	Energy investment credit [1]	1,850	3,410	3,470	3,330	3,330	2,710	1,630	670	80	–120	–150	18,360
18	Alcohol fuel credits [2]	20	0	0	0	0	0	0	0	0	0	0	0
19	Bio-Diesel and small agri-biodiesel producer tax credits [3]	40	0	0	0	0	0	0	0	0	0	0	0
20	Tax credits for clean-fuel burning vehicles and refueling property	590	680	670	490	360	330	280	240	180	130	100	3,460
21	Exclusion of utility conservation subsidies	470	490	520	540	570	590	620	650	680	710	750	6,120
22	Credit for holding clean renewable energy bonds [4]	70	70	70	70	70	70	70	70	70	70	70	700
23	Deferral of gain from dispositions of transmission property to implement FERC restructuring policy	–190	–270	–210	–190	–150	–120	–70	–20	0	0	0	–1,030
24	Credit for investment in clean coal facilities	140	110	100	250	320	190	20	–20	–10	–10	–10	940
25	Temporary 50% expensing for equipment used in the refining of liquid fuels	–1,380	–1,140	–930	–740	–560	–370	–180	–40	0	0	0	–3,960
26	Natural gas distribution pipelines treated as 15-year property	140	150	150	150	120	60	–20	–100	–190	–270	–320	–270
27	Amortize all geological and geophysical expenditures over 2 years	70	60	70	70	70	80	70	60	40	40	50	610
28	Allowance of deduction for certain energy efficient commercial building property	30	–10	–30	–30	–30	–30	–30	–30	–30	–30	–30	–280
29	Credit for construction of new energy efficient homes	170	70	10	0	0	0	0	0	0	0	0	80
30	Credit for energy efficiency improvements to existing homes	290	0	0	0	0	0	0	0	0	0	0	0
31	Credit for residential energy efficient property	1,430	1,380	1,360	1,250	1,060	530	120	20	0	0	0	5,720
32	Qualified energy conservation bonds [5]	30	30	30	30	30	30	30	30	30	30	30	300
33	Advanced Energy Property Credit	50	0	–20	–20	–10	–10	0	0	0	0	0	–60
34	Advanced nuclear power production credit	0	0	170	440	550	550	550	550	550	550	550	4,460
35	Reduced tax rate for nuclear decommissioning funds	210	230	240	260	270	280	290	310	320	340	350	2,890
Natural resources and environment:													
36	Expensing of exploration and development costs, nonfuel minerals	40	50	50	50	50	50	50	50	50	50	50	500
37	Excess of percentage over cost depletion, nonfuel minerals	140	140	150	150	150	150	150	150	140	140	140	1,460
38	Exclusion of interest on bonds for water, sewage, and hazardous waste facilities	420	410	420	420	450	500	540	580	610	650	680	5,260

附件 16

Oil and Natural Gas Industry Tax Issues in the FY2014 Budget Proposal

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CRS Report for Congress
Prepared for Members and Committees of Congress

Table 1. FY2014 Oil/Gas Industry Tax Proposal Revenue Estimates

(in millions of dollars)

Proposed Change	2014	2014-2018	2014-2023
Repeal Enhanced Oil Recovery Credit	0	0	0
Repeal Credits for Oil and Gas from Marginal Wells	0	0	0
Repeal Expensing of Intangible Drilling Costs	1,663	8,986	10,993
Repeal Deduction for Tertiary Injectants	8	54	107
Repeal Passive Loss Exception for Working Interests in Oil and Natural Gas Properties	7	42	74
Repeal Percentage Depletion for Oil and Natural Gas Wells	1,039	5,211	10,723
Repeal the Domestic Manufacturing Deduction for Oil and Natural Gas Companies	1,119	8,824	17,447
Increase Geological and Geophysical Amortization Periods	60	1,138	1,363
Totals	3,896	24,255	40,707

Source: FY2014 federal budget request, Analytical Perspectives, Governmental Receipts, p. 191.

Notes: Revenues represent changes from current law. A zero entry in **Table 1** implies no revenue effect under current and forecasted conditions in oil and natural gas markets. Order of proposals is as per the budget proposal.

As shown in **Table 1**, the proposed tax changes would have the effect of raising an estimated $3.9 billion in FY2014. Almost all (96%) of the revenues from the proposed tax preference repeal from FY2014-FY2023 would come from only three of the proposals, while two of the proposals would provide no revenue at all.

Compared to the FY2013 budget proposal, the current proposal estimates less revenue received in the current year, $3.9 billion compared to $4.8 billion, but higher revenues over the 10-year period, $40.7 billion compared to $38.6 billion. The major difference in the revenue estimates comes from a revision of the revenue gains from repealing the domestic manufacturing deduction for the oil and natural gas industries. That provision was expected to yield $11.6 billion over the 10-year time horizon in 2013, compared to $17.4 billion in the current estimate. In addition, the repeal of the expensing of intangible drilling expenses provision is expected to yield $11 billion in the 2014 proposal, compared to $13.9 billion in the 2013 budget proposal.

Repeal Enhanced Oil Recovery Credit

The enhanced oil recovery credit provides for a credit of 15% of allowable costs associated with the use of oil recovery technologies, including the injection of carbon dioxide, to supplement natural well pressure, which can enhance production from older wells. The credit is only available during periods of low oil prices, determined by yearly guidance with respect to what constitutes a low price. The credit has not been in effect over the past several years. Elimination of this credit would likely not have any effect on current, or expected, oil production, as oil prices are generally expected to remain high. Periods of low oil prices are usually associated with excess supply in the market. During periods of excess supply, it is unlikely that keeping older, higher-cost, low-production wells producing is an effective strategy for oil companies. Revenues from these wells

are unlikely to cover operating costs in periods of low prices, although the credit could provide the margin that keeps some of these wells in production.

Repeal Credit for Oil and Gas from Marginal Wells[4]

The marginal well tax credit was implemented as the result of a recommendation by the National Petroleum Council in 1994.[5] The purpose was to keep low-production oil and natural gas wells in production during periods of low prices for those fuels. The tax credit is designed to maximize U.S. production levels even when energy markets result in low world prices for oil, and low regional prices for natural gas. It is believed that up to 20% of U.S. oil production and 12% of natural gas production might be sourced from wells of this category. The credit was enacted in 2004, but has not been utilized because market prices have been high enough since that time to justify production on economic grounds without the application of the credit. The credit is not likely to be an important factor if prices remain high, or if the United States is successful in transitioning to alternative energy sources. The high-cost wells that fall into the marginal well category are likely to be some of the first eliminated on economic efficiency grounds if a reduction in petroleum prices occurs even if the credit were maintained.

Repeal Expensing of Intangible Drilling Costs

The expensing of intangible drilling costs has been part of the federal tax code since 1913. Intangible drilling costs generally include cost items that have no salvage value, but are necessary for the drilling of an exploratory well, or the development of a well for production. Intangible drilling costs cover a wide range of activities and physical supplies, including ground clearing, draining, surveying, wages, repairs, supplies, drilling mud, chemicals, and cement required to commence drilling, or to prepare for development of a well. The purpose of allowing current-year expensing of these costs is to attract capital to what has historically been a highly risky investment. Current expensing allows for a quicker return of invested funds through reduced tax payments.

In recent years, the risk associated with finding oil has been reduced, but not eliminated, through the use of advanced technology, including three-dimensional seismic analysis and advanced horizontal drilling techniques, among others. These advances make expensive "dry holes" less likely, and expand the physical range of exploration and production activities available from a drilling rig, reducing the cost of exploration of prospective oil and natural gas fields.[6]

In the current law, the full expensing of intangible drilling costs is available to independent oil producers. Since 1986, major integrated oil companies have been able to expense 70% of their

[4] Marginal wells produce on average less than 15 barrels per day, produce heavy oil, or produce up to 25 barrels per day, but with 95% or more water content.

[5] The credit is $3 per barrel (inflation adjusted), and/or $0.50 per thousand cubic feet of natural gas (inflation adjusted) from a marginal well. The credit phases out once threshold prices are reached.

[6] According to Energy Information Administration data, in 1961 there were 44,254 oil and natural gas exploration and development wells drilled in the United States, of which 17,331 were dry (39%). In 2011, 45,529 oil and natural gas exploration and development wells were drilled in the United States, of which 4,761 were dry (10%). Data available at http://www.eia.doe.gov. Part of the reduced cost of dry holes is offset by the cost of using new technologies.

intangible drilling costs and capitalize the remaining 30% over a 60-month period. The FY2014 budget proposal would repeal both direct expensing and the accelerated capitalization provision, and replace them with generally applicable accounting procedures for cost recovery.

Administration estimates are that the repeal of the expensing of intangible drilling costs provision will yield $10.9 billion in revenue over the decade to 2023. In response to a similar tax proposal in the FY2010 federal budget proposal, the Independent Petroleum Association of America (IPAA) estimated that the tax change would result in an initial year reduction in investment in U.S. oil development of about $3 billion.[7] IPAA's estimated reduction in oil development spending implied an almost dollar-for-dollar relationship between higher taxes and reduced investment. Little empirical evidence for the estimate was provided. The effect of the elimination of the expensing of intangible drilling costs in FY2012 was estimated by IPAA to result in an almost immediate one-third reduction in drilling budgets.[8]

Actual reductions in drilling budgets are likely to be determined by the effect of increased taxes in conjunction with the price of oil. If the price of oil were to settle in the $40-per-barrel range that prevailed in December 2008, the burden of additional tax expense on the independent firms could reduce drilling activity. The combination of low oil prices and additional taxes might not justify the development of relatively high-cost resources, especially in deep waters, as in the Gulf of Mexico. However, with the October 2013 price of oil around $100 per barrel, reflecting political unrest in the Middle East as well as other factors, the additional tax expense is likely to have a smaller effect on reducing oil development activity.[9]

Repeal Tertiary Injectants Deduction

Tertiary injection expenses, including the injectant cost, can be fully deducted in the current tax year. Supporters of the favorable current treatment of these expenses point to the importance of tertiary recovery methods in maintaining the output of older wells, as well as the environmental advantages of injecting carbon dioxide, a primary tertiary injectant, into wells. Repeal of the deduction, or less favorable tax treatment of the expenses, would be likely to reduce oil output from older producing fields during periods when the profit margin, and the price of oil, is low. During a period of high oil prices, the repeal is likely to have a smaller effect on production levels.

Repeal Passive Loss Exception for Working Interests in Oil Properties

Repeal of the passive loss exception for working interests in oil and natural gas properties is a relatively small item in terms of tax revenues, estimated at $74 million from FY2014 to FY2023. The provision exempts working interests, investments, in gas and oil exploration and

[7] Independent Petroleum Association of America, "New Natural Gas and Oil Taxes Would Crush America's Clean Energy and Energy Security," http://www.ipaa.org/news/docs/ObamasNewtaxes2009.pdf.

[8] Independent Petroleum Association of America, "Increasing Taxes on America's Independent Natural Gas and Oil Producers—A Bad Idea," http://www.ipaa.org.

[9] On October 18, 2013, the observed futures price of West Texas Intermediate on the NYMEX was $101.1 per barrel.

development from being categorized as "passive income (or loss)" with respect to the Tax Reform Act of 1986. This categorization permits the deduction of losses accrued in oil and gas projects against other active income earned without limitation, and is believed to act as an incentive to induce investors to finance oil and gas projects.

Repeal Percentage Depletion Allowance

Percentage depletion is the practice of deducting from an oil company's gross income a percentage value, in the current law 15%, which represents, for accounting and tax purposes, the total value of the oil deposit that was extracted in the tax year. Percentage depletion has a long history in the tax treatment of the oil industry, dating back to 1926. The purpose of the percentage depletion allowance is to provide an analog to normal business depreciation of assets for the oil industry, in effect equating the tax treatment of oil deposits to the tax treatment of capital equipment in more traditional manufacturing industries. The analogy is based on the observation that both capital equipment in traditional manufacturing, as well as an oil deposit, are "wasting resources" in the sense that they both require capital investment to generate an income stream, and that both will eventually become nonproductive through obsolescence or through wearing out. Depreciation allowances are applied against the investment in capital equipment, and depletion allowances are applied to the value of oil deposits as a way to recover initial investments.

In its current form, the allowance is limited to domestic U.S. production by independent producers, on the first 1,000 barrels per day, per well, of production, and is limited to 65% of the producer's net income.

Percentage depletion was eliminated for the major oil companies in 1975. Although major oil companies' profits were likely affected by the tax change, their production of oil showed little variation as a result. Production of oil within the United States remains attractive for companies because ownership of the oil is allowed in this country. In most areas of the world, ownership of oil is vested in the national oil company, as a proxy for the state itself. The result is generally a lower share of revenues for private oil companies producing outside the United States. The Administration projects that the repeal of the percentage depletion allowance would yield tax revenues of approximately $10.7 billion over the period FY2014 through FY2023.

Repeal Manufacturing Tax Deduction (§199)

A provision in the proposed budget for FY2014 that affects both independent and the major companies' oil and natural gas tax liability is the repeal of the domestic manufacturing tax deduction for those industries.[10] As shown in **Table 1**, the Administration estimates that the repeal of this deduction for the oil and natural gas industries would contribute $1.1 billion in revenue in 2014, $8.8 billion for the period FY2014 to FY2018. The total increase in tax revenue is estimated to be $17.4 billion from FY2014 to FY2024, according to estimates reported in the budget proposal.

[10] The FY2014 budget proposal also requests repeal of the deduction for coal and other hard minerals in addition to oil and natural gas. This proposal is revenue-neutral in the sense that revenues gained by the repeal of the deduction for these industries would be used to finance an increase in the deduction rate for other domestic manufacturing firms.

附件 17

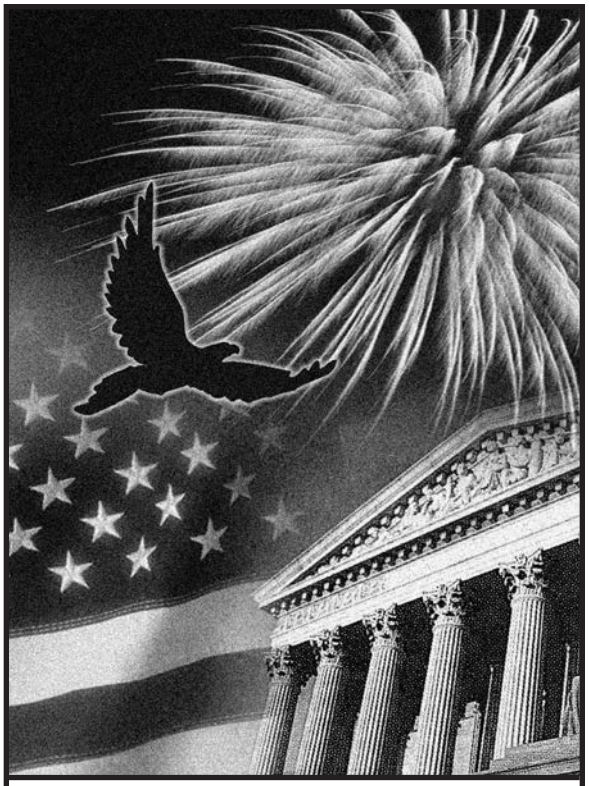
Department of the Treasury

Internal Revenue Service

Publication 535
Cat. No. 15065Z

Business Expenses

For use in preparing
2018 Returns



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Contents

Introduction

This publication discusses common business expenses and explains what is and is not deductible. The general rules for deducting business expenses are discussed in the opening chapter. The chapters that follow cover specific expenses and list other publications and forms you may need.

Note. Section references within this publication are to the Internal Revenue Code and regulation references are to the Income Tax Regulations under the Code.

Comments and suggestions. We welcome your comments about this publication and your suggestions for future editions.

You can send us comments from *IRS.gov/FormComments*. Or you can write to:

Internal Revenue Service
Tax Forms and Publications
1111 Constitution Ave. NW, IR-6526
Washington, DC 20224

Although we cannot respond individually to each comment received, we do appreciate your feedback and will consider your comments as we revise our tax forms, instructions, and publications.

Jul 24, 2019

Basis reduction for corporations. A corporation must reduce the amortizable basis of a pollution control facility by 20% before figuring the amortization deduction.

More information. For more information on the amortization of pollution control facilities, see sections 169 and 291(c) and the related regulations.

Research and Experimental Costs

You can elect to amortize your research and experimental costs, deduct them as current business expenses, or write them off over a 10-year period (see *Optional write-off method* below).

If you elect to amortize these costs, deduct them in equal amounts over 60 months or more. The amortization period begins the month you first receive an economic benefit from the costs.

For a definition of "research and experimental costs" and information on deducting them as current business expenses, see chapter 7.

Optional write-off method. Rather than amortize these costs or deduct them as a current expense, you have the option of deducting (writing off) research and experimental costs ratably over a 10-year period beginning with the tax year in which you incurred the costs. For more information, see *Optional Write-Off of Certain Tax Preferences*, later, and section 59(e).

Costs you can amortize. You can amortize costs chargeable to a capital account (see chapter 1) if you meet both of the following requirements.

- You paid or incurred the costs in your trade or business.
- You aren't deducting the costs currently.

How to make the election. To elect to amortize research and experimental costs, complete Part VI of Form 4562 and attach it to your income tax return. Generally, you must file the return by the due date (including extensions). However, if you timely filed your return for the year without making the election, you can still make the election by filing an amended return within 6 months of the due date of the return (excluding extensions). Attach Form 4562 to the amended return and write "Filed pursuant to section 301.9100-2" on Form 4562. File the amended return at the same address you filed the original return.

Your election is binding for the year it is made and for all later years unless you obtain approval from the IRS to change to a different method.

Optional Write-Off of Certain Tax Preferences

You can elect to amortize certain tax preference items over an optional period beginning in the tax year in which you incurred the costs. If you make this election, there is no AMT adjustment.

The applicable costs and the optional recovery periods are as follows.

- Circulation costs—3 years.
- Intangible drilling and development costs—60 months.
- Mining exploration and development costs—10 years.
- Research and experimental costs—10 years.

How to make the election. To elect to amortize qualifying costs over the optional recovery period, complete Part VI of Form 4562 and attach a statement containing the following information to your return for the tax year in which the election begins.

- Your name, address, and taxpayer identification number.
- The type of cost and the specific amount of the cost for which you are making the election.

Generally, the election must be made on a timely filed return (including extensions) for the tax year in which you incurred the costs. However, if you timely filed your return for the year without making the election, you can still make the election by filing an amended return within 6 months of the due date of the return (excluding extensions). Attach Form 4562 to the amended return and write "Filed pursuant to section 301.9100-2" on Form 4562. File the amended return at the same address you filed the original return.

Revoking the election. You must obtain consent from the IRS to revoke your election. Your request to revoke the election must be submitted to the IRS in the form of a letter ruling before the end of the tax year in which the optional recovery period ends. The request must contain all of the information necessary to demonstrate the rare and unusual circumstances that would justify granting revocation. If the request for revocation is approved, any unamortized costs are deductible in the year the revocation is effective.

9. Depletion

Introduction

Depletion is the using up of natural resources by mining, drilling, quarrying stone, or cutting timber. The depletion deduction allows an owner or operator to account for the reduction of a product's reserves.

There are two ways of figuring depletion: cost depletion and percentage depletion. For mineral property, you generally must use the method that gives you the larger deduction. For standing timber, you must use cost depletion.

Topics

This chapter discusses:

- Who can claim depletion
- Mineral property
- Timber

Useful Items

You may want to see:

Publication

- ❑ **544** Sales and Other Dispositions of Assets
- ❑ **551** Basis of Assets

Form (and Instructions)

- ❑ **Schedule E (Form 1040)** Supplemental Income and Loss
- ❑ **Schedule K-1 (Form 1065)** Partner's Share of Income, Deductions, Credits, etc.
- ❑ **Schedule K-1 (Form 1120S)** Shareholder's Share of Income, Deductions, Credits, etc.
- ❑ **6198** At-Risk Limitations
- ❑ **8582** Passive Activity Loss Limitations
- ❑ **T (Timber)** Forest Activities Schedule

See chapter 13 for information about getting publications and forms.

Who Can Claim Depletion?

If you have an economic interest in mineral property or standing timber, you can take a deduction for depletion. More than one person can have an economic interest in the same mineral deposit or timber. In the case of leased property, the depletion deduction is divided between the lessor and the lessee.

You have an economic interest if both the following apply.

- You have acquired by investment any interest in mineral deposits or standing timber.
- You have a legal right to income from the extraction of the mineral or cutting of the timber to which you must look for a return of your capital investment.

A contractual relationship that allows you an economic or monetary advantage from products of the mineral deposit or standing timber is not, in itself, an economic interest. A production payment carved out of, or retained on the sale of, mineral property is not an economic interest.

CAUTION *Individuals, estates, and trusts who claim depletion deductions may be liable for the AMT. For tax years beginning after 2017, the Tax Cuts and Jobs Act, section 12001, repealed the corporate AMT.*

Basis adjustment for depletion. You must reduce the basis of your property by the depletion allowed or allowable, whichever is greater.

附件 18

Congressional Research Service
Informing the legislative debate since 1914

The Value of Energy Tax Incentives for Different Types of Energy Resources: In Brief

Molly F. Sherlock
Specialist in Public Finance

May 18, 2017

Congressional Research Service
7-5700
www.crs.gov
R44852

CRS REPORT
Prepared for Members and
Committees of Congress

Table 2. Energy-Related Tax Preferences, 2016

billions of dollars

Provision	2016 Cost
Fossil Fuels	
Credits for investments in Clean Coal Facilities	0.2
Expensing of Exploration and Development Costs: Oil and Gas	1.8
Excess of Percentage over Cost Depletion: Oil and Gas	0.7
Excess of Percentage over Cost Depletion: Other Fuels	0.2
Amortization of Geological and Geophysical Expenditures Associated with Oil and Gas Exploration	0.1
Amortization of Air Pollution Control Facilities	0.5
15-year Depreciation Recovery Period for Natural Gas Distribution Lines	0.2
Exceptions for Publicly Traded Partnerships with Qualified Income Derived from Certain Energy-Related Activities	0.9
Alternative Fuel Mixture Credit	0.6
Subtotal, Fossil Fuels	*5.2*
Renewables	
Energy Credit, Investment Tax Credit (ITC)	2.6
Production Tax Credit (PTC)	3.4
Residential Energy-Efficient Property Credit	1.1
Credit for Investment in Advanced Energy Property	0.3
5-year Depreciation Recovery Period for Certain Energy Property (solar, wind, etc.)	0.3
Treasury Grant in Lieu of Tax Credit	0.1
Subtotal, Renewables	*7.8*
Efficiency	
Credit for New Energy-Efficient Homes	0.4
Deduction for Energy-Efficient Commercial Buildings	0.2
Credit for Energy-Efficient Improvements to Existing Homes	0.5
Subtotal, Efficiency	*1.1*
Renewable Fuels	
Biodiesel Tax Credits	3.6
Subtotal, Renewable Fuels	*3.6*
Alternative Technology Vehicles	
Credit for Plug-In Electric Vehicles	0.3
Subtotal, Alternative Technology Vehicles	*0.3*

(...continued)

facilities is currently *de minimis*. However, should qualifying capacity be placed in service by the end of 2020, there may be positive tax expenditures associated with this provision.

附件 19

ENERGY POLICY & THE ENVIRONMENT REPORT
January 2009
Published by Manhattan Institute

TAXING ENERGY IN THE UNITED STATES: Which Fuels Does the Tax Code Favor?

Gilbert E. Metcalf
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Tufts University
Research Associate,
National Bureau of Economic Research

CEPE
CENTER FOR ENERGY POLICY AND THE ENVIRONMENT
AT THE MANHATTAN INSTITUTE

A. Federal Tax Provisions

To begin, income earned in the production or distribution of energy is subject to the U.S. income tax, mostly that on corporate income, which has a top federal marginal rate of 35 percent. Table 5 indicates the share of assets in various energy-related industries subject to the corporate income tax. The vast bulk of assets in the mining, utilities, and petroleum and coal-manufacturing sectors is subject to corporate income tax.

Table 5. Share of Assets Subject to Corporate Income Tax

Industry	Corporate Income-Tax Treatment
Mining	92.3%
Utilities	99.6%
Petroleum and Coal Products, Manufacturing	99.2%
Retail Gasoline Sales	47.6%
Pipeline Transportation	68.5%

Source: Congressional Budget Office (2006), table 3

I analyze energy investments in this paper assuming that firms are subject to federal and state corporate income taxes.[8] Many energy firms are subject to the corporate alternative minimum tax (AMT). While I do not analyze the corporate AMT in detail in this paper, I do note in various places where my analytic results can be affected by the AMT.[9]

1. DEPRECIATION

Under the current tax code, capital assets are depreciated according to the Modified Accelerated Cost Recovery System (MACRS), with recovery periods ranging from three to thirty-nine years. A declining-balance method is used to depreciate most capital, at either 200 percent (three-, five-, seven-, and ten-year property) or 150 percent (fifteen- and twenty-year property), with the option to shift to straight-line depreciation at whichever point it becomes advantageous to do so. Assuming that firms switch to straight-line depreciation at the point where straight-line provides a larger deduction than declining-balance, the two key parameters are the recovery period of the asset and the declining-balance deduction rate. Table 6 illustrates how an asset with a value of $1 would be depreciated under straight-line and double-declining-balance rules, assuming a seven-year recovery period.

Under straight-line depreciation, the taxpayer is allowed to deduct one-seventh of the value of an asset with a recovery period of seven years. The remaining basis in each year is the share of the asset that has not yet been depreciated and that can be depreciated in future years. At the end of seven years, all the asset has been depreciated, and zero basis remains. Under the double-declining-balance method, two-sevenths of the value of the asset may be depreciated in the first year. In subsequent years, two-sevenths of the remaining basis may be taken as a deduction. With these rules, the asset would never be fully depreciated. Thus taxpayers at any point may switch to applying straight-line depreciation to the remaining basis. After year three, it is not advantageous to switch to straight-line, since the deduction allowed in year four would equal 0.364/4 = 0.091, which is less than the amount allowed under double-declining balance (0.104). In the following year, it is advantageous to switch, and the remaining basis is depreciated over the final three years of the asset.[10] Tax depreciation effectively reduces the purchase price of an asset.[11]

Electric generating capital is depreciated over different tax lives, depending on the type of plant. Recovery periods range from five years for renewable energy to twenty years for coal. High-voltage electricity transmission lines received a fifteen-year recovery period in the Energy Policy Act of 2005. That act also clarified the depreciation of natural-gas gathering (seven years) and reduced the recovery period of distribution pipelines from twenty years to fifteen. In addition, the new law contains a provision allowing partial expensing of new refinery capacity placed in service before 2012. The provision allows for 50 percent expensing, with the remainder deducted, as under current law.

New deprecation provisions for "smart grid" technology were included in the Emergency Economic Stabi-

附件 20

Order Code RL33763

CRS Report for Congress

Oil and Gas Tax Subsidies: Current Status and Analysis

December 20, 2006

Salvatore Lazzari
Specialist in Public Finance
Resources, Science, and Industry Division

Prepared for Members and Committees of Congress

For purposes of percentage depletion, before EPACT05, an independent oil producer was one that, on any given day, (1) did not refine more than 50,000 barrels of oil and (2) did not have a retail operation grossing more than $5 million a year (IRC § 613A[d]). EPACT05 raised the 50,000 barrel daily limit to 75,000. In addition, the act changed the refinery limitation from actual daily production to average daily production for the taxable year. Accordingly, the average daily refinery runs for the taxable year may not exceed 75,000 barrels. For this purpose, the taxpayer would calculate average daily refinery runs by dividing total refinery runs for the taxable year by the total number of days in the taxable year. This is effective for taxable years ending after the date of enactment.

Natural Gas Distribution Lines Treated as 15-Year Property

For purposes of determining the depreciation deduction, EPACT05 established a 15-year recovery period for natural gas distribution lines. Prior to this amendment, natural gas distribution lines were assigned a 20-year recovery period. This provisions is effective for property, the original use of which begins with the taxpayer after April 11, 2005, which is placed in service after April 11, 2005, and before January 1, 2011, and does not apply to property subject to a binding contract on or before April 11, 2005.

Temporary Expensing for Equipment Used in Oil Refining

Before the enactment of EPACT05, depreciation rules (the Modified Accelerated Cost Recovery System, MACRS) required oil refinery assets to be depreciated over 10 years using the double declining balance method.[17] Under the 2005 act, refineries are allowed to irrevocably elect to expense 50% of the cost of qualified refinery property, with no limitation on the amount of the deduction. This provision was enacted to increase investments in existing refineries so as to increase petroleum product output and reduce prices.

The expensing deduction is allowed in the taxable year in which the refinery is placed in service. The remaining 50% of the cost remains eligible for regular cost recovery provisions. To qualify for the deduction (1) original use of the property must commence with the taxpayer; (2)(a) construction must be pursuant to a binding construction contract entered into after June 14, 2005, and before January 1, 2008, (b) in the case of self-constructed property, construction began after June 14, 2005, and before January 1, 2008, or (c) the refinery is placed in service before January 1, 2008; (3) the property must be placed in service before January 1, 2012; (4) the property must meet certain production capacity requirements if it is an addition to an existing refinery; and (5) the property must meet all applicable environmental laws when placed in service. Certain types of refineries, including asphalt plants, are not eligible for the deduction, and there is a special rule for sale-leasebacks of qualifying refineries. If the owner of the refinery is a cooperative, it may elect to allocate all or a part of the deduction to the cooperative owners, allocated on the basis of ownership

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[17] Under the double declining balance method of calculating depreciation deductions, the annual deduction is a fixed percentage (200% or double the straight-line rate) of the difference between asset cost and prior year depreciation deductions.

interests. This provision is effective for qualifying refineries placed in service after date of enactment (i.e., it became effective on August 9, 2005).

Arbitrage Rules Not To Apply to Prepayments for Natural Gas

EPACT05 creates a safe harbor exception to the general rule that tax-exempt, bond-financed prepayments violate the tax code's arbitrage restrictions. The term *investment-type property* does not include a prepayment under a qualified natural gas supply contract. The act also provides that such prepayments are not treated as private loans for purposes of the private business tests. Thus, a prepayment financed with tax-exempt bond proceeds for the purpose of obtaining a supply of natural gas for service area customers of a governmental utility would not be treated as the acquisition of investment-type property. The safe harbor provisions do not apply if the utility engages in intentional acts to render (1) the volume of natural gas covered by the prepayment to be in excess of that needed for retail natural gas consumption and (2) the amount of natural gas that is needed to fuel transportation of the natural gas to the governmental utility. This provision is effective for obligations issued after date of enactment.

Natural Gas Gathering Lines Treated as Seven-Year Property

Under tax law prior to the enactment of EPACT05, the recovery period for natural gas gathering lines could be either 7 or 15 years, depending on whether they were classified as production or transportation equipment. Several court cases reflected the ambiguous tax treatment. Natural gas pipelines had a recovery period of 15 years, whereas natural gas distribution lines had a recovery period of 20 years (which, as noted above, was reduced to 15 years). EPACT05 assigned natural gas gathering lines a seven-year recovery period for MACRS depreciation deductions.

EPACT05 defined a natural gas gathering line as the pipe, equipment, and appurtenances determined to be a gathering line by the Federal Energy Regulatory Commission (FERC) or used to deliver natural gas from the well-head or common point to the point at which the gas first reaches (1) a gas processing plant, (2) an interconnection with an interstate transmission line, (3) an interconnection with an intrastate transmission pipeline, or (4) a direct connection with a local distribution company, a gas storage facility, or an industrial consumer. Also, the act requires that the original use of the property begin with the taxpayer. This provision became effective for property placed in service after April 11, 2005, excluding property with respect to which the taxpayer or related party had a binding acquisition contract on or before April 11, 2005.

Pass Through to Owners of Deduction for Capital Costs Incurred by Small Refiner Cooperatives in Complying with EPA Sulfur Regulations

IRC § 45H allows a small refiner to claim a tax credit for the production of low-sulfur diesel fuel that is in compliance with Environmental Protection Agency (EPA) sulfur regulations (the Highway Diesel Fuel Sulfur Control Requirements). The credit is $2.10 per barrel of low-sulfur diesel fuel produced; it is limited to 25% of

附件 21

Dataset: Fossil Fuel Support - USA

					Mechanism	Tax expenditure
					Level	Subnational
					Unit	US dollar
					Year	2016
Measure	**Incidence**	**Indicator**	**Stage**	**Fuel Type**		
Gross Production Tax Rebate for 3D Seismic Wells	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Petroleum	Crude oil	233,714
				Natural gas		749,286
Gross Production Tax Rebate for Economically At Risk Wells				Petroleum	Crude oil	2,299,810
				Natural gas		7,373,190
Gross Production Tax Exemption for O&G Owned by Government				Petroleum	Crude oil	1,468,616
				Natural gas		4,708,384
Gas Marketing Deduction Against Gross Production Tax						14,339,000
Sales Tax Exemption for Electricity Used in Enhanced Oil Recovery	Cost of Intermediate Inputs			Petroleum	Crude oil	1,956,000
Gas Gross Production Tax Exemptions + Oil Extraction Tax	Land and natural resources					144,987,592
				Natural gas		39,225,903
Severance-Tax Exemption for Stripper Wells				Petroleum	Crude oil	12,176,375
				Natural gas		32,311,550
Severance-Tax Oil and Gas Ad Valorem Credit				Petroleum	Crude oil	0
				Natural gas		0
Cook Inlet Platform Royalty Relief				Petroleum	Crude oil	1,746,852
				Natural gas		0
Small Cook Inlet Discoveries Royalty Relief				Petroleum	Crude oil	0
				Natural gas		0
Royalty Modification for Ooguruk Unit				Petroleum	Crude oil	26,192,088
Taxable Per Barrel Credit	Output Returns					523,000,000
Gas Storage Facility Credit	Capital		Transportation of fossil fuels (e.g., through	Natural gas		0
LNG Storage Facility Credit						0
Gas Exploration and Development Credit	Land and natural resources		Extraction or mining stage			0
Gross Value Reduction				Petroleum	Crude oil	0
				Natural gas		0
Oil and Gas Industry Service Expenditures Credit				Petroleum	Crude oil	0
				Natural gas		0
Sales Tax Exemption for Oil & Gas Equipment	Capital			Petroleum	Crude oil	58,446,419
				Natural gas		76,453,581
Property-Tax Exemption for Intangible Drilling Expenses	Cost of Intermediate Inputs			Petroleum	Crude oil	0
In-State Refinery Tax Credit	Capital					0
Impact Assistance Credit						0
				Natural gas		0
Severance-Tax Reductions for Low-Volume Wells	Land and natural resources			Petroleum	Crude oil	0
				Natural gas		0
Severance-Tax Reductions for New Oil-Shale Facilities				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Severance-Tax Exemption for Low-Volume Oil-Shale Production				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Occupational-Privilege-Tax Exemption for Oil and Gas Workers	Labour			Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Reduced Value for Certain Mineral Properties	Land and natural resources			Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Sales-Tax Exemption for CO2 Used in Tertiary Recovery	Cost of Intermediate Inputs			Petroleum	Crude oil	0
Sales-Tax Exclusion for Installation of Board Roads in Oil-fields						0
				Natural gas		0
Sales-Tax Exclusion on Drilling Rigs				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Sales-Tax Exemption for Repairs and Materials Used on Drilling Rigs				Petroleum	Crude oil	0
				Natural gas		0
Severance Tax Exemptions for Crude Oil and Natural Gas	Land and natural resources			Petroleum	Crude oil	112,514,683
				Natural gas		30,440,468
Cost of Complying with Sulphur Regulations	Cost of Intermediate Inputs			Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Full Expensing of Capital Investments in Qualified New Refinery Capacity	Capital			Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Gross Production and Excise Tax Credits, Small Business and Rural	Enterprise Income			Petroleum	Crude oil	149,073
				Natural gas		477,927
Realty-Transfer Tax Exemption for Resource Leases	Land and natural resources			Petroleum	Crude oil	0
				Natural gas		0
Severance-Tax Reduction for Stripper Wells				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Severance-Tax Reduction for Tertiary Recovery				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0

24-Month Severance-Tax Reduction				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Severance-Tax Reduction for Workover Wells				Petroleum	Crude oil	0
Severance-Tax Reduction for Idle Wells						0
Severance-Tax Exemption for Flared Natural Gas				Natural gas		0
Sales-Tax Exemption for Transporting Drilling Rigs				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Sales-Tax Exemption for Certain Well Services				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Qualified Capital Expenditure Credit	Capital			Petroleum	Crude oil	440,577,070
				Natural gas		166,422,930
Sales-Tax Exemption for CO2 Used in Tertiary Production	Cost of Intermediate Inputs			Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Severance-Tax Credit for Certain R&D Projects						0
Reduced Tax Rate for Certain Wells Outside the Bakken and Three Forks Region				Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Coal Conversion Tax Exemptions						0
Sales tax exemption for oil	Capital		Refining or processing stage	Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Development Credit for Small Producers and New Areas	Output Returns		Extraction or mining stage	Petroleum	Crude oil	36,291,357
				Natural gas		13,708,643
Sales tax exemption for CO2 used for enhance oil recovery	Cost of Intermediate Inputs			Petroleum	Crude oil	0
					Natural gas	0
				Natural gas		0
Sales tax exemption for natural gas						0
Alternative Credit for Exploration	Capital			Petroleum	Crude oil	36,291,357
				Natural gas		13,708,643
Exclusion of Low Volume Oil & Gas Wells	Land and natural resources			Petroleum	Crude oil	126,748
				Natural gas		4,373,252
Coalbed Methane Exemption						0
Percentage Depletion of Mineral and Other Resources	Capital			Petroleum	Crude oil	6,241,163
				Natural gas		1,438,101
Excess of Percentage over Cost Depletion				Petroleum	Motor Gas/diesel	0
						0
Natural Gas Severance Tax Suspension for Horizontal Wells	Land and natural resources			Natural gas		84,472,151
Natural Gas Severance Tax Suspension for Inactive Wells						170,506
Natural Gas Severance Tax Suspension for Deep Wells						10,107,072
Natural Gas Severance Tax Suspension for New Discovery Wells						1,000,000
Reduced Severance Tax on Incapable Oil Well Gas						916,891
Reduced Severance Tax on Incapable Gas Well Gas						21,768,480
Oil Deduction Severance Tax on Transportation Fees	Output Returns		Transportation of fossil fuels (e.g., through	Petroleum	Crude oil	363,029
Severance Tax Suspension on Oil from Horizontal Wells	Land and natural resources		Extraction or mining stage			11,872,434
Severance Tax Suspension on Oil from Inactive Wells						5,969,788
Severance Tax Suspension on Oil from Deep Wells						11,081,247
Severance Tax Suspension on Oil from New Discovery Wells						20,000,000
Severance Tax Suspension on Oil from Tertiary Recovery						13,039,821
Reduced Severance Tax Rate on Incapable Oil Wells						5,192,613
Reduced Severance Tax Rate on Oil from Stripper Wells						19,512,184
Severance Tax Exclusion on Flared or Vented Natural Gas				Natural gas		518,675
Severance Tax Exclusion for Natural Gas Used in Field Operations						7,453,016
Severance Tax Exclusion for Carbon Black Producers			Refining or processing stage			370,144
Excess of Percentage over Cost Depletion	Capital		Extraction or mining stage	Petroleum	Crude oil	4,550,880
				Natural gas		14,590,120
Enhanced Oil Recovery Deduction	Land and natural resources			Petroleum	Crude oil	43,747
				Natural gas		140,253
Gross Production Tax Rebate for Horizontally Drilled Wells				Petroleum	Crude oil	1,741,322
				Natural gas		5,582,678
Gross Production Tax Rebate for Reestablished Production				Petroleum	Crude oil	220,637
				Natural gas		707,363
Gross Production Tax Rebate for Production Enhancement				Petroleum	Crude oil	1,897,052
				Natural gas		6,081,948
Gross Production Tax Rebate for Deep and Ultra Deep Wells				Petroleum	Crude oil	548,502
				Natural gas		1,758,498
Gross Production Tax Rebate for New Discovery Wells				Petroleum	Crude oil	86,305
				Natural gas		276,695

Dataset: Fossil Fuel Support - USA

					Mechanism	Budgetary
					Level	Subnational
					Unit	US dollar
					Year	2016
Measure	**Incidence**	**Indicator**	**Stage**	**Fuel Type**		
Alaska Gasline Inducement Act	Capital	Producer Support Estimate	Transportation of fossil fuels (e.g., through pipelines)	Natural gas		0
Enhanced Oil Recovery Commission	Knowledge	General Services Support Estimate	Extraction or mining stage	Petroleum	Crude oil	5,195,930
Oil and Gas Research Fund						7,870,628
				Natural gas		2,129,372
Oil and Gas Impact Grant Fund	Land and natural resources			Petroleum	Crude	117,524,065
				Natural gas		22,475,935
Abandoned Oil and Gas Well Plugging and Site Reclamation				Petroleum	Crude	11,000,766
				Natural gas		2,976,220

Data extracted on 26 Feb 2019 03:24 UTC (GMT) from OECD.Stat

附件 22

United States Government Accountability Office

GAO

Report to Congressional Requesters

October 2007

FEDERAL ELECTRICITY SUBSIDIES

Information on Research Funding, Tax Expenditures, and Other Activities That Support Electricity Production

GAO-08-102

- *Fossil fuel programs*. Fossil fuel programs were appropriated $3.1 billion in electricity-related R&D funding from fiscal year 2002 through fiscal year 2007. Appropriations for these programs were relatively constant during the 6-year period we examined. Appropriations totaled $531 million in fiscal year 2002, peaked at $574 million in fiscal year 2004, and then returned to $531 million in fiscal year 2007. Most of the funding variation within these programs was due to the Clean Coal Power Initiative, which is aimed at accelerating the deployment of advanced technologies to reduce air emissions and other pollutants from coal-burning power plants. Funding for the Clean Coal Power Initiative decreased from $210 million in fiscal year 2004 to $62 million in fiscal year 2005, before increasing to $75 million in fiscal year 2007. Other significant fossil fuel energy programs include the fuels and power systems program, which provides research funding aimed at reducing coal-burning power plant carbon emissions, and the FutureGen program, which focuses on the technical capability of coproducing electricity and hydrogen with near-zero emissions.

- *Renewable programs*. Renewable programs were appropriated $1.4 billion in electricity-related R&D funding from fiscal year 2002 through fiscal year 2007. During this period, appropriations for these programs grew by 23 percent, increasing from $248 million in fiscal year 2002 to $305 million in fiscal year 2007. Variations in funding were primarily attributable to funding for the Solar program, which makes up the largest share of renewable program funding. Here, funding more than doubled between fiscal year 2006 and 2007, rising from $99 million to $203 million. Other renewable energy programs include wind, biomass, and geothermal programs. The hydrogen R&D program was not included in our analysis as hydrogen primarily is used as an alternative fuel for transportation.

Based on our review of the Department of the Treasury (Treasury) estimates, the sum of revenue loss estimates associated with tax expenditures specifically related to electricity totaled $18.2 billion from fiscal year 2002 to fiscal year 2007.[3] Over this period, revenue loss estimates associated with these tax expenditures increased by 88 percent,

[3]Summing tax expenditure estimates provides a gauge of general magnitude but does not take into account interactions between individual provisions. Of the $18.2 billion amount, we could assign $16.5 billion to fuel types. We could not assign one electricity-related tax expenditure, deferral of gain from dispositions of transmission property, to a fuel type. This tax expenditure totaled $1.7 billion during the period of our analysis. All tax expenditure estimates are based on projections using prior year data; whereas historical data are available for federal receipts and outlays, the last available values for tax expenditures remain estimates.

Results in Brief

For electricity-related R&D, we estimate

- DOE received $11.5 billion (2007 dollars) in funding from FY2002 to FY2007.
- Funding grew by 35 percent from FY2002 to FY2007.
- Funding spread across several fuels: about $6.2 billion was provided to nuclear, $3.1 billion to fossil fuels, and $1.4 billion to renewables.

For electricity-related tax expenditures, we estimate

- Tax expenditures totaled $18.2 billion (2007 dollars) from FY2002 to FY2007.
- Grew by 88 percent from FY2002 to FY2007.
- Tax expenditures largely go to fossil fuels: about $13.7 billion was provided to fossil fuels and $2.8 billion to renewables.
- We did not include the credit for production from advanced nuclear power facilities because there is no current revenue loss from the credit as advanced nuclear facilities have yet to be constructed.

Federal loan and loan guarantees, preferred borrowing, and other activities may also subsidize electricity.

附件 23

SR/CNEAF/2008-01

Federal Financial Interventions and Subsidies in Energy Markets 2007

April 2008

Energy Information Administration
Office of Coal, Nuclear, Electric, and Alternate Fuels
U.S. Department of Energy
Washington, DC 20585

Table ES3. Allocation of Electricity Production and Other Energy Subsidies (million 2007 dollars)

Subsidy and Support Category	FY 2007 Electricity Production Subsidies and Support	FY 2007 Other Energy Subsidies and Support	FY 2007 Total Energy Subsidies and Support
Fuel Specific[1]	5,105	2,330	7,435
Transmission and Distribution [2]	1,235	-	1,235
Federal Utilities and RUS Borrowers Capacity[3]	407	-	407
Energy Subsidies Unrelated to Electricity Production[4]	-	7,504	7,504
Total	6,747	9,834	16,581

NOTES: Totals may not equal sum of components due to independent rounding.

[1]Includes fuel-related tax expenditures, R&D, and direct expenditures applicable entirely to a specific type of electric generation, or primary fuel production-related subsidies allocated to either electricity or other sectors based on each sector's proportionate consumption of the applicable fuel. Excludes fuels that have no role in electricity production such as ethanol and other biofuels.

[2] Includes transmission and distribution-related tax expenditures, R&D, and $360 million of estimated financial support attributable to Federal utilities' and RUS borrowers' debt associated with transmission and distribution assets.

[3]Reflects the estimated portion of Federal utilities' and RUS borrowers' interest support attributable to long-term debt associated with capacity and certain TVA and BPA regulatory assets. This support is then assigned by fuel-type.

[4]Includes tax and direct expenditures for end-use activities and transportation-related alternative fuels. Among these subsidies are conservation programs, residential and commercial energy efficiency programs, and ethanol and biofuels tax credits.

Sources: See Table 26, Table 27 and Table 30.

Findings Regarding Electricity Production-Related Subsidies

Subsidies and support related to electricity production are estimated at $6.7 billion (Table ES3), or about 41 percent of total energy subsidies. A significant portion of electricity subsidies and support ($1.2 billion, or 18 percent of total electricity subsidies and support) is directed to electric plant or infrastructure, such as transmission. Another $407 million consists of capital cost support associated with electric generation assets of Federal utilities and RUS loans. The beneficiaries of this support are electricity consumers who purchase power produced by the Federal utilities and RUS borrowers. The estimated interest subsidy associated with these assets is allocated by fuel type. The remaining $5.1 billion of electricity subsidies are either directed at specific types of electricity production, based on fuel type or investment, or expenses associated with upstream production and transportation of fuels used in electricity production—all of which either affect the cost of the input fuel or reduce the cost of generating equipment used to produce electricity.

Tax expenditures comprise about two-thirds of the total subsidies and support related to electricity production (Table ES4). The alternative fuel production tax credit,[1] which is largely directed to producers of coal-based synthetic fuels, also referred to as refined coal, accounted for about one-half of total tax expenditures related to electricity production in FY 2007.

Nuclear programs, renewable programs, and non-fuel-specific electricity production subsidies and support each ranged from $1 billion to $1.3 billion.

Natural gas and petroleum liquids receive a lower level of support from electricity production-related subsidies and support than other fuel groups. Overall, electricity production-related subsidies are spread broadly across the various fuel groups, probably more so than in the past.[2]

Table ES4. Fiscal Year 2007 Electricity Production Subsidies and Support (million 2007 dollars)

Fuel End Use	Direct Expenditures	Tax Expenditures	Research & Development	Federal Electricity Support	Total
Coal	-	264	522	68	854
Refined Coal	-	2,156	-	-	2,156
Natural Gas and Petroleum	-	203	4	20	227
Nuclear	-	199	922	146	1,267
Renewables	3	724	108	173	1,008
Transmission and Distribution	-	735	140	360	1,235
Total	3	4,281	1,696	767	6,747

NOTES: Estimates of Federal electricity program support are based on the most recent audited annual reports for Federally-owned utilities which conform to Federal fiscal year convention. The Rural Utilities Service estimate is based on calendar year 2005 data.

Totals may not equal sum of components due to independent rounding.

Sources: See Table 34.

Electricity production subsidies and support per unit of production (dollars per megawatthour) vary widely by fuel. Coal-based synfuels (refined coal) that are eligible for the alternative fuels tax credit, solar power, and wind power receive, by far, the highest subsidies per unit of generation, ranging from more than $23 to nearly $30 per megawatthour of generation (Table ES5). Subsidies and support for these generation sources are substantial in relationship to the price or cost of electricity at the wholesale or end-user level. The average U.S. electricity price was about $53 per megawatthour at the wholesale level in 2006 and about $92 per megawatthour to end users in all sectors in FY 2007.[3]

[1] The alternative fuel production tax credit was initially established in the Windfall Profit Tax Act of 1980 (Public Law 96-223). The provision was codified in Section 29 of the Internal Revenue Code. It was subsequently modified by Section 710 of the American Jobs Creation Act of 2004 (Public Law 108-357) to include synthetic coal, which was redefined as refined coal and recodified in Section 45 of the Internal Revenue Code. The expiration date to qualify for the credit was extended in EPACT2005.
[2] EIA did not analyze electricity production subsidies in particular in its 2000 report. However, a line item comparison of various energy subsidies indicates that newer subsidy programs have been directed toward fuel groups and activities, such as renewables, conservation, and transmission that previously received less attention.
[3] Energy Information Administration Form EIA-861 "Annual Electric Power Industry Report," 2006; and Energy Information Administration, *Electric Power Monthly December 2007*, DOE/EIA 0026(0712) (Washington, DC, December 2007), Table 5.6.B.

Table ES5. Subsidies and Support to Electricity Production: Alternative Measures

Fuel/End Use	FY 2007 Net Generation (billion kilowatthours)	Alternative Measures of Subsidy and Support	
		FY 2007 Subsidy and Support (million 2007 dollars)	Subsidy and Support per Unit of Production (dollars/megawatthour)
Coal	1,946	854	0.44
Refined Coal	72	2,156	29.81
Natural Gas and Petroleum Liquids	919	227	0.25
Nuclear	794	1,267	1.59
Biomass (and biofuels)	40	36	0.89
Geothermal	15	14	0.92
Hydroelectric	258	174	0.67
Solar	1	14	24.34
Wind	31	724	23.37
Landfill Gas	6	8	1.37
Municipal Solid Waste	9	1	0.13
Unallocated Renewables	NM	37	NM
Renewables (subtotal)	360	1,008	2.80
Transmission and Distribution	NM	1,235	NM
Total	4,091	6,747	1.65

NOTES: Unallocated renewables include projects funded under Clean Renewable Energy Bonds and the Renewable Energy Production Incentive.

NM=Not meaningful. Totals may not equal sum of components due to independent rounding.

Sources: See Table 35

The differences between rankings of subsidies and support based on absolute amounts and amounts per megawatthour are driven by substantial differences in the amount of electricity generation across fuels. Capital-intensive, baseload generating technologies, such as coal-fired steam generators and nuclear generators, together produce about 70 percent of total net generation,[4] which tends to reduce their subsidies and support per unit of production compared to the other fuel groups (Table ES5). For the same reason, electricity subsidies for solar and wind show a relatively large subsidy per unit of production, as these groups account for less than 1 percent of total net generation in the country. It is important to recognize that the subsidies-per-megawatthour calculations are a snapshot taken at a particular point in time. Some electricity sources, such as nuclear, coal, oil, and natural gas, have received varying levels of subsidies and support in the past which may have aided them in reaching their current role in electricity production.[5] The impacts of prior subsidies, some of which may no longer be in effect, are not measured in the current analysis.

A per-unit measure of electricity production subsidies and support may provide a better indicator of its market impact than an absolute measure. For example, even though coal receives more subsidies in absolute terms than wind power, the use of wind is likely to be more dependent on the availability of subsidies than the use of coal.

[4] In fiscal year 2007, nuclear and coal accounted for 68 percent of total net generation.
[5] See Energy Information Administration, Federal *Financial Interventions and Subsidies in Energy Markets 1999: Primary Energy,* SR/OIAF/99-03 (Washington, DC, September 1999); Energy Information Administration, *Federal Energy Subsidies: Direct and Indirect Interventions in Energy Markets,* SR/EMEU/92-02 (Washington, DC, November 1992).

Table 26. Allocation of Electricity Production and Other Energy Subsidies (million 2007 dollars)

Subsidy and Support Category	FY 2007 Electricity Production Subsidies and Support	FY 2007 Other Energy Subsidies and Support	FY 2007 Total Energy Subsidies and Support
Fuel Specific[1]	5,105	2,330	7,435
Transmission and Distribution[2]	1,235	-	1,235
Federal Utilities and RUS Borrowers Capacity[3]	407	-	407
Energy Subsidies Unrelated to Electricity Production[4]	-	7,504	7,504
Total	6,747	9,834	16,581

NOTES: Totals may not equal sum of components due to independent rounding.

[1]Includes fuel-related tax expenditures, R&D, and direct expenditures applicable entirely to a specific type of electric generation, or primary fuel production-related subsidies allocated to either electricity or other sectors based on each sector's proportionate consumption of the applicable fuel. Excludes fuels that have no role in electricity production, such as ethanol and other biofuels.

[2] Includes transmission and distribution-related tax expenditures, R&D, and the financial support attributable to Federal utilities' and RUS borrowers' debt associated with transmission and distribution assets with an estimated value of $360 million (See Table 34).

[3]Reflects the estimated portion of Federal utilities' and RUS borrowers' interest support attributable to long-term debt associated with capacity plant and certain TVA and BPA regulatory assets. This support is then assigned by fuel-type.

[4]Includes tax and direct expenditures for end-use activities and transportation-related alternative fuels. Among these subsidies are conservation programs, residential and commercial energy efficiency programs, and ethanol and biofuels tax credits.

Sources: Office of Management and Budget, *Budget of the United States Government, Fiscal Year 2008-Appendix*. Office of Management and Budget, *Analytical Perspectives Budget of the United States Government, Fiscal Year 2008, Federal Receipts and Collections*, http://www.whitehouse.gov/omb/budget/fy2008/. Joint Committee on Taxation, "Estimated Budget Effects Of The Conference Agreement For Title XIII of H.R. 6, The Energy Tax Incentives Act Of 2005," JCX59-05, July 27, 2005. (Washington, DC, November 2007).
Energy Information Administration, Form EIA-860, "Annual Electric Generator Report," 2006; Energy Information Administration, Form EIA-906, "Power Plant Report;" and Form EIA-920, "Combined Heat and Power Plant Report," October 2006 through September 2007.

To the extent these incentives provide benefits to all users of transmission facilities placed under the operational control of RTOs/ISO, all forms of generation benefit. Accordingly, these tax expenditures are included in non-production-related electricity subsidies. Subsidies unrelated to electricity production, totaling $7.5 billion, are not included in the estimate of direct and indirect subsidies for electricity production, as are $2.3 billion in fuel-related subsidies that are allocated to consumers, i.e., residential, commercial, industrial and transportation, based their direct receipt and consumption of the applicable fuel.

Allocation of Subsidies

This portion of the chapter describes the method used to allocate the four categories of subsidies described above. The following four sections provide a description of the methodology and the specific subsidies that comprise the $16.6 billion of total energy-related subsidies and support, and the $6.7 billion assigned to electricity production.

Per-Unit Electricity Subsidies by Fuel Type

When grouped by type of subsidy, tax expenditures account for $4.3 billion of the estimated $6.7 billion in electric production subsidies (Table 34). R&D is the second largest category of subsidies at $1.7 billion. When allocated by fuel type fuel type, refined coal alternative fuel production tax credits account for one-half at $2.2 billion, followed by nuclear at $1.3 billion and non-fuel specific electricity subsidies at $1.2 billion. Renewable electricity production received an estimated $1.0 billion in subsidies, of which $724 million consists of tax expenditures.

Table 34. Fiscal Year 2007 Electricity Production Subsidies and Support (million 2007 dollars)

Fuel/Other	Direct Expenditures	Tax Expenditures	Research & Development	Federal Electricity Support	Total
Coal	-	264	522	68	854
Refined Coal	-	2,156	-	-	2,156
Natural Gas and Petroleum Liquids	-	203	4	20	227
Nuclear	-	199	922	146	1,267
Renewables	3	724	108	173	1,008
Transmission and Distribution	-	735	140	360	1,235
Total	3	4,281	1,696	767	6,747

NOTE: Totals may not equal sum of components due to independent rounding.

Sources: Office of Management and Budget, *Budget of the United States Government Fiscal Year 2008-Appendix*, Office of Management and Budget, *Analytical Perspectives Budget of the United States Government, Fiscal Year 2008, Federal Receipts and Collections*. See, http://www.whitehouse.gov/omb/budget/fy2008/. Joint Committee on Taxation, "Estimated Budget Effects Of The Conference Agreement For Title XIII Of H.R. 6, The Energy Tax Incentives Act Of 2005," JCX59-05, July 27, 2005. Energy Information Administration, *Electric Power Annual 2006*, DOE/EIA-0348(2006) (Washington, DC, November 2007). Energy Information Administration, Form EIA-906, "Power Plant Report;" Form EIA-920 "Combined Heat and Power Plant Report;" October 2006-September 2007. Tennessee Valley Authority SEC 10-K, 2006. Bonneville Power Administration 2006 Annual Report. Southeastern Power Administration 2005 Annual Report. Southwestern Power Administration 2004-2006 Annual Report and Western Area Power Administration 2006 Annual Report.

The per-unit subsidies are calculated as the subsidies allocated to each fuel type divided by the FY 2007 electricity generated by each fuel type (Table 35). Refined-coal-related generation receives the largest subsidy in absolute terms, at roughly $2 billion, as well as the highest per-unit value at $29.81 per megawatthour. Renewable electricity production, in aggregate, received subsidies totaling $1.0 billion, but the per-unit subsidy in aggregate is $2.80 per megawatthour. On a fuel-specific basis, solar and wind subsidies receive the second-and-third highest per unit subsidies. However, the total value of subsidies received by each of these technologies was roughly in proportion to their relative share of net generation. As, a result, their respective per-unit subsidies are nearly equal. In the case of solar, the per-unit subsidy estimate of $24.34 per megawatthour is a function of the relatively high allocation of subsidies received, $14 million, and its low share of total electricity production. Wind received $724 million in subsidies, valued at $23.37 per megawatthour.

Table 35. Subsidies and Support to Electricity Production: Alternative Measures

Fuel/End Use	FY 2007 Net Generation (billion kilowatthours)	Alternative Measures of Subsidy and Support	
		Subsidy and Support Value 2007 (million dollars)	Subsidy and Support Per unit of Production (dollars/megawatthours)
Coal	1,946	854	0.44
Refined Coal	72	2,156	29.81
Natural Gas and Petroleum Liquids	919	227	0.25
Nuclear	794	1,267	1.59
Biomass (and Biofuels)	40	36	0.89
Geothermal	15	14	0.92
Hydroelectric	258	174	0.67
Solar[1]	1	14	24.34
Wind	31	724	23.37
Landfill Gas	6	8	1.37
Municipal Solid Waste	9	1	0.13
Unallocated Renewables	NM	37	NM
Renewables (subtotal)	360	1,008	2.80
Transmission and Distribution	NM	1,235	NM
Total	4,091	6,747	1.65

NOTES: Total may not equal sum of components due to independent rounding.

Unallocated renewables include projects funded under Clean Renewable Energy Bonds and the Renewable Energy Production Incentive.

NM = Not meaningful.

[1]Net generation rounded to the nearest whole number. The actual value is 583 million kilowatthours.

Sources: Energy Information Administration, Forms EIA-906, "Power Plant Report;" Form EIA-920, "Combined Heat and Power Plant Report;" October 2006-September 2007.

Of the $9.8 billion in energy subsidies not related to electricity (Table 36), about one-third of the total promotes fuels, particularly ethanol and biodiesel, which are eligible to receive a blender's credit under the Volumetric Ethanol Excise Tax Credit (VEETC). Blenders receive a $0.51 per gallon credit for each gallon of ethanol that is blended with gasoline for use as a motor fuel. In FY 2007, ethanol (and biofuels) consumption was just over half a quadrillion Btu, or about one half of one percent of all the energy consumed in the United States. On a consumption basis, ethanol is subsidized at a rate of $5.72 per million Btu, more than any other non-electric fuel.

About 60 percent of all fuel consumed in the United States is consumed by primary end-use sectors, i.e., residential, commercial, industrial and transportation. In FY 2007 subsidies for petroleum liquids and natural gas totaled $2.1 billion. Although natural gas-fired generation has increased 86 percent between 1997 and 2007, power sector consumption of natural gas has increased only slightly as a share of total energy consumption in the United States, growing from around 5 percent of the national total to just under 7 percent. So, of the $2.1 billion in total natural gas and petroleum liquids subsidies, $1.9 billion are allocated to the primary end-use

sectors with the remainder to electricity production. With over 60 percent of total energy consumption in the U.S. associated with natural gas and petroleum, the two fuels receive relatively small subsidies on a consumption unit basis, only about three cents per million Btu. Similarly, hydrogen, which is used in fuel cells and in a limited number of transportation pilot programs received $230 million in subsidies in FY 2007. However, consumption is so small that the subsidy per million Btu is not meaningful for comparison purposes in Table 36.

Subsidies totaling another $3.6 billion do not directly affect fuel production or specific fuel consumption. These programs focus on energy efficiency, conservation, and energy-related financial assistance to residential, commercial, and industrial end-users. The largest of these programs, the Low Income Home Energy Assistance Program (LIHEAP), provided $2.2 billion in FY 2007 to subsidize heating and cooling costs. No program information is available to determine the portion of the expenditure directed to the affected fuels, which include distillate fuel, natural gas, coal, and electricity.

附件 24

The University of Texas at Austin
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The Full Cost of Electricity (FCe-)

Federal Financial Support for Electricity Generation Technologies

PART OF A SERIES OF WHITE PAPERS

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2 WHAT IS A SUBSIDY AND WHAT DO WE INCLUDE IN OUR ANALYSIS?

Financial support is commonly called subsidy. While we will use subsidy as a short-hand for fi ancial support throughout this report, specific programs have different intents and methods, which influences their economic impact on energy projects and costs as well as government cash fl w (e.g., forsaken revenues versus direct expenditures). Over the years, numerous entities, including various government agencies and civil society organizations, have produced reports to document federal fi ancial support mechanisms and their contributions to different energy sectors, fuels and technologies. These analyses employ different defin tions of subsidy and scopes of analysis yielding results that differed by more than an order of magnitude.

For example, a study of fossil fuel production subsidies commissioned by the U.S. Treasury identifi d eleven provisions worth $4.7 billion per year (UST 2014). By contrast, a study, sponsored by the Organization for Economic Cooperation and Development (OECD) of energy subsidies in the U.S. identifi d $74 billion in spending each year (Koplow, 2007, 95). UST (2014) only includes provisions targeting energy production while Koplow (2007) includes a host of spending related to defense, foreign aff irs, and transportation infrastructure. The intent of government support included in UST (2014) is clear and it is relatively straightforward to estimate the magnitude of this support. On the other hand, government intent and costs are less easy to confi m for categories included in Koplow (2007) as some of them such as global spending on defense, military construction, and foreign operations and export fi ancing are not directed to any particular industry **to build generation in the U.S.** although they may have benefited the energy industry **globally** along with other infrastructure industries indirectly. Th s comparison illustrates the disagreement regarding not only the categories to include as a subsidy but also on the set of assumptions needed to estimate the magnitude of each category.

Dictionary defin tions of subsidy focus on direct money fl ws but the Latin root of the word subsidy suggests other forms of support.[4] Th Global Subsidies Initiative (GSI) offers a broader defin tion: "A subsidy is a fi ancial contribution by a government, or agent of a government, that confers a benefit on its recipients" (Steenblik 2007, 8). Th s defin tion, albeit somewhat vague, widens the scope in at least two ways: fi st, a "benefit" can be extended beyond a direct payment, and, second, recipients can include consumers and public entities not just businesses. The GSI then suggests nine categories of subsidy.[5] **Given the scope of our report, we remain closer to the dictionary definition and use the term "subsidy" in the rest of the report as a short-hand for federal programs with the explicit intent to provide financial support to electricity generation or fuels used extensively in power generation.** Next, we provide detailed rationale for inclusion and exclusion of specific ategories in this analysis.

4 The Oxford English Dictionary defines a subsidy as "A sum of money granted by the government or a public body to assist an industry or business so that the price of a commodity or service may remain low or competitive." The Merriam-Webster definition of subsidy is almost identical: "money that is paid usually by a government to keep the price of a product or service low or to help a business or organization to continue to function." The Latin root of the word subsidy, **subsidium**, means "support, assistance, aid, help, protection" and suggests broader possibilities that could include forms of assistance other than direct payments.

5 Cash grants and other direct payments (e.g., biofuel producers in the U.S., agricultural subsidies), tax concessions (e.g., tax preferences such as exemptions, credits, and deferrals discussed earlier), in-kind subsidies (e.g., low-rent housing, bridge to serve a community or an industrial facility, access to public lands for free or at a below-market price), cross subsidy (e.g., electricity prices to residential, commercial and industrial users, fuel subsidies—low-priced diesel, high-priced gasoline), credit subsidies and government guarantees (e.g., low-interest loans, loan guarantees), hybrid subsidies (tax engineering such as tax increment financing), derivative subsidies (a catch-all term to capture downstream and upstream impacts of a subsidized project such as aluminum smelters associated with large hydroelectric dams), government procurement (e.g., requirements to buy domestic), and market price support (e.g., agricultural commodity prices set by governments, import tariffs—e.g., on ethanol in the U.S.) (Steenblick 2007)

TABLE 5:

Electricity Spending by Type & Fuel (2010, 2013, 2016, 2019, $ million, nominal)

Type	Direct Expenditures				Tax Expenditures					Total
	Section 1603	R&D	Other	Subtotal	Elec. Sales	Power Plants	Fuel Sales	Fuel Prod.	Subtotal	
FY2010 Spending Summary by Type & Fuel										
Coal	-	307	46	353	28	359	-	235	622	**975**
HC	-	9	45	54	-	-	-	726	726	**780**
Nuclear	-	446	46	492	-	1,137	-	-	1,137	**1,629**
Renewables	4,481	1,060	26	5,567	1,596	875	-	-	2,471	**8,038**
Wind	4,002	58	1	*4,061*	1,338	-	-	-	*1,338*	**5,399**
Solar	359	320	22	*701*	-	355	-	-	*355*	**1,056**
Other	120	682	3	*805*	258	520	-	-	*777*	**1,582**
Total	**4,481**	**1,822**	**163**	**6,466**	**1,624**	**2,371**	**-**	**961**	**4,956**	**11,422**
FY2013 Spending Summary by Type & Fuel										
Coal	-	202	74	276	40	581	66	213	900	**1,176**
HC	-	34	50	84	-	-	-	711	711	**795**
Nuclear	-	406	9	415	-	1,289	-	-	1,289	**1,704**
Renewables	8,169	976	11	9,156	1,630	3,413	-	-	5,043	**14,199**
Wind	*4,273*	*49*	*1*	*4,323*	*1,367*	-	-	-	*1,367*	***5,690***
Solar	*2,941*	*284*	*6*	*3,231*	-	*2,715*	-	-	*2,715*	***5,946***
Other	*955*	*643*	*4*	*1,602*	*263*	*698*	-	-	*961*	***2,563***
Total	**8,169**	**1,618**	**144**	**9,931**	**1,670**	**5,283**	**66**	**923**	**7,942**	**17,873**
FY2016 Spending Summary by Type & Fuel										
Coal	-	270	64	334	40	561	91	413	1,105	**1,439**
HC	-	23	50	73	-	-	-	1,154	1,154	**1,227**
Nuclear	-	452	29	481	140	392	-	-	532	**1,013**
Renewables	-	1,080	20	1,100	3,220	3,563	-	-	6,783	**7,883**
Wind	-	*57*		*57*	*2,700*	-	-	-	*2,700*	***2,757***
Solar	-	*320*		*320*	-	*2,820*	-	-	*2,820*	***3,140***
Other	-	*703*		*703*	*520*	*743*	-	-	*1,263*	***1,966***
Total	**-**	**1,825**	**163**	**1,988**	**3,400**	**4,516**	**91**	**1,567**	**9,575**	**11,563**
FY2019 Spending Summary by Type & Fuel										
Coal	-	287	68	354	40	531	66	490	1,127	**1,481**
HC	-	24	53	78	-	-	146	997	1,143	**1,221**
Nuclear	-	480	31	511	340	488	-	-	828	**1,338**
Renewables	-	1,146	21	1,167	5,111	3,882	-	-	8,993	**10,160**
Wind	-	*60*		*60*	*4,591*	-	-	-	*4,591*	***4,651***
Solar	-	*340*		*340*	-	*3,345*	-	-	*3,345*	***3,685***
Other	-	*746*		*746*	*520*	*537*	-	-	*1,057*	***1,803***
Total	**-**	**1,937**	**173**	**2,110**	**5,491**	**4,900**	**212**	**1,487**	**12,091**	**14,200**

Notes: ARRA Section 1603 spending is assumed to be zero for 2016 although pending litigation could result in a small, positive value for this year.

TABLE 7:

Per-MWh Subsidy by Type & Fuel (2010, 2013, 2016, 2019, $ nominal)

Type	Direct Expenditures				Tax Expenditures					Total
	Section 1603	R&D	Other	Subtotal	Elec. Sales	Power Plants	Fuel Sales	Fuel Comp.	Subtotal	
FY2010 Spending Summary by Type & Fuel										
Coal	-	0.17	0.02	0.19	0.02	0.19	-	0.13	0.34	0.53
HC	-	0.01	0.04	0.05	-	-	-	0.72	0.72	0.77
Nuclear	-	0.55	0.06	0.61	-	1.41	-	-	1.41	2.02
Renewables	26.51	6.27	0.15	32.94	9.44	5.18	-	-	14.62	47.56
Wind	42.19	0.61	0.01	42.82	14.11	-	-	-	14.11	56.93
Solar	88.60	78.98	5.43	173.01	-	87.69	-	-	87.69	260.69
Other	1.71	9.73	0.04	11.48	3.68	7.41	-	-	11.09	22.57
Avg. All Fuel	**1.09**	**0.44**	**0.04**	**1.57**	**0.40**	**0.58**	**-**	**0.23**	**1.21**	**2.78**
FY2013 Spending Summary by Type & Fuel										
Coal	-	0.13	0.05	0.17	0.03	0.37	0.04	0.13	0.57	0.74
HC	-	0.03	0.04	0.07	-	-	-	0.62	0.62	0.69
Nuclear	-	0.51	0.01	0.53	-	1.63	-	-	1.63	2.16
Renewables	31.13	3.72	0.04	34.90	6.21	13.01	-	-	19.22	54.12
Wind	25.46	0.29	0.01	25.76	8.14	-	-	-	8.14	33.90
Solar	158.63	15.32	0.32	174.27	-	146.44	-	-	146.44	320.71
Other	12.56	8.46	0.05	21.08	3.46	9.18	-	-	12.65	33.72
Avg. All Fuel	**2.01**	**0.40**	**0.04**	**2.44**	**0.41**	**1.30**	**0.02**	**0.23**	**1.95**	**4.39**
FY2016 Spending Summary by Type & Fuel										
Coal	-	0.20	0.05	0.25	0.03	0.41	0.07	0.30	0.81	1.06
HC	-	0.02	0.04	0.05	-	-	-	0.85	0.85	0.91
Nuclear	-	0.58	0.04	0.62	0.18	0.50	-	-	0.68	1.30
Renewables	-	3.17	0.06	3.22	9.43	10.44	-	-	19.87	23.10
Wind	-	0.26	-	0.26	12.48	-	-	-	12.48	12.74
Solar	-	6.26	-	6.26	-	55.05	-	-	55.05	61.31
Other	-	9.54	-	9.54	7.06	10.08	-	-	17.14	26.68
Avg. All Fuel	**-**	**0.44**	**0.04**	**0.48**	**0.83**	**1.10**	**0.02**	**0.38**	**2.33**	**2.81**
FY2019 Spending Summary by Type & Fuel										
Coal	-	0.21	0.05	0.26	0.03	0.38	0.05	0.35	0.81	1.07
HC	-	0.02	0.04	0.06	-	-	0.11	0.78	0.89	0.95
Nuclear	-	0.62	0.04	0.66	0.44	0.63	-	-	1.07	1.74
Renewables	-	2.43	0.04	2.47	10.81	8.21	-	-	19.03	21.50
Wind	-	0.20	-	0.20	14.95	-	-	-	14.95	15.15
Solar	-	3.92	-	3.92	-	38.59	-	-	38.59	42.51
Other	-	9.46	-	9.46	6.59	6.80	-	-	13.40	22.85
Avg. All Fuel	**-**	**0.46**	**0.04**	**0.50**	**1.30**	**1.16**	**0.05**	**0.35**	**2.86**	**3.36**

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The Full Cost of Electricity (FCe-)

State Level Financial Support for Electricity Generation Technologies

AN ANALYSIS OF TEXAS & CALIFORNIA

PART OF A SERIES OF WHITE PAPERS

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TABLE 7:

Value of Texas Electricity-Related Financial Support ($ million, nominal)

Proximity and Fuel	2010	2013	2016	2019
Fuel Sales	**287**	**293**	**395**	**299**
Coal	77	90	77	66
Hydrocarbons	210	203	318	233
Oil	< 0.1	<0.1	< 0.1	< 0.1
Natural Gas	201	199	314	230
Undifferentiated	9	4	4	3
Fuel Extraction	**55**	**78**	**52**	**49**
Coal	4	4	4	4
Hydrocarbons	51	74	49	45
Electricity Sales	**22**	**26**	**6**	**5**
Renewables	22	26	6	5
Wind	22	26	6	5
Power Plants	**51**	**55**	**105**	**141**
Nuclear	1	1	2	2
Renewables	49	54	103	139
Wind	44	49	88	118
Solar	2	5	15	19
Other RE	3	0	1	2
T&D and Storage	**101**	**968**	**1,045**	**976**
Renewables	101	968	1,045	976
Wind	101	968	1,045	976
Total (without CREZ)	**415**	**452**	**559**	**493**
Total	**516**	**1,419**	**1,604**	**1,470**
Coal	81	94	81	70
Oil	0	0	0	0
Natural Gas	201	199	314	230
Undifferentiated Hydrocarbons	60	78	53	48
Nuclear	1	1	2	2
Renewables	172	1,047	1,154	1,120
Wind	167	1,042	1,138	1,099
Solar	2	5	15	19
Other RE	3	0	1	2

Notes: "Total (without CREZ)" refers to annual Texas financial support for electricity when subtracting our estimated costs for the CREZ transmission lines.

TABLE 9:

Texas $/MWh Financial Support by Type & Fuel (2010, 2013, 2016, 2019, annual $ nominal divided by annual generation per fuel)

Proximity and Fuel	2010	2013	2016	2019
Fuel Sales	0.70	0.68	0.87	0.64
Coal	0.51	0.60	1.11	0.49
Hydrocarbons	1.10	0.98	1.11	1.05
Fuel Extraction	0.13	0.18	0.12	0.10
Coal	0.02	0.02	0.05	0.03
Hydrocarbons	0.27	0.36	0.17	0.20
Power Plants	0.12	0.13	0.23	0.30
Nuclear	0.03	0.04	0.05	0.05
Renewables	1.78	1.42	1.74	1.95
Wind	1.68	1.36	1.66	1.83
Solar	256	29.6	8.72	10.6
Other RE	1.07	0.14	-	-
Electricity Sales	0.05	0.06	0.01	0.01
Wind	0.84	0.72	0.11	0.08
T&D and Storage	3.86	27.0	19.8	15.2
Renewables	3.86	27.0	19.8	15.2
Wind	3.86	27.0	19.8	15.2
Portfolio Total (wtd. avg., without CREZ)	1.01	1.04	1.23	1.06
Portfolio Total (wtd. avg., with CREZ)	1.26	3.28	3.54	3.15
Coal	0.54	0.63	1.16	0.52
Hydrocarbons	1.37	1.34	1.28	1.25
Nuclear	0.03	0.04	0.05	0.05
Renewables (with CREZ $)	6.22	27.7	19.4	15.7
Renewables (without CREZ $)	2.57	2.11	1.84	2.02
Wind (with CREZ $)	6.38	29.1	21.6	17.1
Wind (without CREZ $)	2.52	2.07	1.77	1.91
Solar	256	29.6	8.72	10.6
Other RE	1.07	0.14	0	0

Notes: Total and subtotal values are category subsidy subtotal divided by total Texas electricity generation from all generator types. (with CREZ $): refers to total annual wind subsidies, including CREZ costs, divided by annual electricity generation from all wind farms. (without CREZ $): refers to total annual wind subsidies, not including CREZ costs, divided by annual electricity generation from all wind farms.

On a portfolio wide basis, financial support for electricity generating technologies is worth 2-4 $/MWh over the study period (Table 9). If one neglected CREZ costs, the value is about 1 $/MWh. The overall 2-4 $/MWh calculation is slightly below the range we estimated for federal support at 3-5 $/MWh for electricity generation (Griffiths, et al., 2017). These Texas benefits differ dramatically by year and technology. Conventional fuels like coal and natural gas receive 1-2 $/MWh. Wind receives up to 30 $/MWh (at peak) if including CREZ costs, but receives approximately 2 $/MWh when not including CREZ costs. These results hold despite our estimate that fossil fuels receive

TABLE 13:

California Energy-related Financial Support by Type & Fuel (2010, 2013, 2016, 2019, $ million, nominal)

Category	2010	2013	2016	2019
Electricity Sales	**1,934**	**2,623**	**4,021**	**4,621**
Renewables	1,934	2,623	4,021	4,621
Wind	760	1,201	1,044	1,093
Solar	105	565	2,264	2,908
Geothermal	482	364	347	304
Biopower	404	399	267	218
Hydro	183	93	99	98
Power Plants and Capital	**854**	**1,353**	**1,765**	**2,335**
Renewables	652	1,308	1,476	1,823
Wind	2	-	-	-
Solar	476	772	570	385
Geothermal	-	-	-	-
Biopower	-	-	-	-
Hydro	-	-	-	-
RE (Undifferentiated)	178	540	910	1,442
Nuclear	4	4	3	3
Fuel Cells	197	33	35	26
Energy Storage	1	8	250	483
Fuel Sales & Extraction	**24**	**24**	**33**	**35**
Hydrocarbons	24	24	33	35
R&D	**3**	**130**	**180**	**158**
Electricity	-	63	64	64
Biopower	3	3	50	29
Other Renewables	-	57	58	58
Hydrocarbons	-	6	6	6
Energy Storage	-	2	2	2
Total	**2,819**	**4,071**	**5,937**	**7,088**
Renewables	2,587	3,931	5,497	6,444
Wind	762	1,201	1,044	1,093
Solar	581	1,337	2,834	3,293
Geothermal	482	364	347	304
Biopower	407	401	317	247
Hydro	183	93	99	98
RE (Undifferentiated)	178	596	967	1,500
Hydrocarbons	24	29	39	41
Nuclear	4	4	3	3
Fuel Cells	197	33	35	26
Energy Storage	1	10	252	485

TABLE 15:

California Volumetric Electricity-Related Financial Support ($/MWh)

Category	2010	2013	2016	2019
Electricity Sales	**6.66**	**8.84**	**15.2**	**17.0**
Renewables	47.9	47.1	79.0	72.4
Wind	56.1	47.4	46.6	39.9
Solar	110	105	109	85.0
Geothermal	36.0	27.6	29.7	26.6
Biopower	58.2	50.3	51.7	51.9
Hydro	32.9	24.5	26.5	25.0
Power Plants and Capital	**2.94**	**4.56**	**6.65**	**8.59**
Renewables	16.2	23.6	29.1	28.6
Wind	0.14	-	-	-
Solar	496	143	27.4	11.2
Nuclear	0.11	0.17	0.15	0.15
Fuel Sales & Production	**0.01**	**0.00**	**0.01**	**0.01**
Hydrocarbons	0.01	0.01	0.01	0.02
R&D	**0.01**	**0.44**	**0.68**	**0.58**
Biopower	0.36	0.32	9.7	6.9
Renewables	-	1.02	1.13	0.90
Hydrocarbons	-	0.04	0.04	0.04
Total	**9.70**	**13.7**	**22.4**	**26.1**
Renewables	64.1	70.7	108	101
Wind	56.3	47.4	46.6	39.9
Solar	606	248	136	96.2
Geothermal	36.0	27.6	29.7	26.6
Biopower	58.6	50.3	61.4	58.7
Hydro	32.9	24.5	26.5	25.0
Hydrocarbons	0.19	0.22	0.26	0.29
Nuclear	0.11	0.17	0.15	0.15

Note: Bolded values are the subcategory of financial support dollars divided by total California electricity generation.

附件 25

United States

G20 coal subsidies

The US federal government provides **no support to transition away from coal**, despite recent major coal power plant closures

Coal and the US's economy

US$58,560	5,206	36,207	31%
GDP per capita, PPP (2016–2017 average)	2016 imports (kilotonne oil equivalent)	2016 exports (kilotonne oil equivalent)	Share in power mix (by generation)

Key findings

- The US provides over US$1 billion per year in fiscal support for coal mining at federal level (2016–2017 average), split between tax expenditures that benefit coal mining companies and research and development spending via the Department of Energy's Office of Fossil Energy.
- Support for consumption of coal and coal-fired electricity is mainly provided at state level, accounting for over US$718 million in fiscal support (2016–2017 average).

Prominence of fossil fuels and subsidy phase-out commitments

- The Trump Administration has moved to repeal the Clean Power Plan which aimed to accelerate the US transition away from coal-fired power plants.
- Despite this, and other federal policy efforts to further subsidise coal-fired power, more coal-fired power plants were retired in the first two years of the Trump Administration than in the first Obama Administration, driven by both market forces and local opposition (DiSavino, 2019). 2018 saw the closure of 14.5 gigawatts (GW) of coal-fired generating capacity. In March 2019, a bid to keep the 2.4 GW Navajo Generating Station operating failed, so it will close (Randazzo and Smith, 2019).
- Coal accounted for 31% of US electricity generation in 2016, with all fossil fuels totalling 65% (IEA, 2019).
- As a member of the G20, the US has committed to phase out inefficient fossil fuel subsidies over the medium term (as agreed in 2009), and as a G7 member to do so with a 2025 deadline (G20, 2009; G7, 2016).

Government support to coal production

- Our analysis has identified over US$1 billion of subsidies to coal production per year (2016–2017 average), provided through tax exemptions and budgetary contributions. But some

of the largest subsidies to coal production in the US are not reflected in these findings, as they are difficult to quantify and absent from the Organisation for Economic Co-operation and Development (OECD) Inventory of Support Measures for Fossil Fuels – the source used in this analysis to allow for comparability between countries. However, other analyses estimate many of these subsidies (Redman, 2017).

- For example, the Powder River Basin – one of the main US coal-production regions and among the biggest in the world – is not currently designated a 'coal-producing region'. This has contributed to a lack of management of the resource, and a lack of competition for leases, resulting in low bid prices. Some estimates assess the value of this de facto subsidy alone to be nearly US$1 billion annually (Sanzillo, 2012).

Government support to coal-fired power production

- Some federal government efforts to further subsidise coal-fired power production have failed as a result of pushback from regulators or the judiciary. For example, in 2017 Secretary of Energy Rick Perry proposed subsidisation of coal-fired power plants, arguing that the reliability of facilities that keep more than 90 days of fuel on site was undervalued by the market. However, this was rejected by the Federal Energy Regulatory Commission (Bade, 2018).
- New state-level efforts to prevent coal-fired power plants from closing emerged in 2018 and 2019. For example, a bill signed by Wyoming's governor in March 2019 will force any utility selling a coal-fired power plant to continue purchasing the electricity generated by that plant from the new owner, even if less expensive sources of electricity are available. These costs would be passed on to ratepayers, and one economist has estimated that this could increase the average household electricity bill in the state by US$1,000 annually (Scott, 2019).

Government support to coal and coal-fired power consumption

- The bulk of support for coal-fired power consumption is in the form of state-level consumption subsidies to electricity used by households. This represents coal's share in the total amount of subsidies that are provided to electricity consumption (for all fossil fuel-based electricity). Our analysis estimates US$718 million per year of support benefiting coal and coal-fired power consumption (2016–2017 average).

Government support to the transition away from coal and coal-fired power

- No federal-level government support to the transition away from coal or coal-fired power was identified.

The US's government support to coal and coal-fired power production and consumption
US$ millions, 2016–2017 annual average

Instrument	Coal production[i]	Coal-fired power	Coal consumption[ii]	Transition support[iii]
Fiscal support (budgetary transfers and tax exemptions)	1,057	173	718	none identified
Public finance	11	none identified	none identified	none identified
Domestic	none identified	–	–	–
International	11	–	–	–
State-owned enterprise investment	none identified	none identified	none identified	none identified

Note: for more detail and sources see the US data sheet available at odi.org/g20-coal-subsidies/us.

[i] This category includes support for coal exploration, mining, processing and transportation.

[ii] This category includes support for consumption of coal-fired power, and of coal other than for its use for coal-fired power generation (or for co-generation of power and heat).

[iii] This category includes support for closing down mining sites, and for workers and communities in their transition away from coal and coal-fired power.

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Fiscal support (budgetary transfers and tax exemptions)

Measure	Level	Mechanism	Incidence	Indicator	Stage	Fuel type	Fuel sub-type	2016 (USD)	2017 (USD)	Estimated annual amount (USD)	Source	Notes
Coal Severance Tax Exemptions	Sub-national	Tax expenditure	Cost of Intermediate Inputs	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Coal Severance Tax Exemptions	Sub-national	Tax expenditure	Cost of Intermediate Inputs	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Coal Severance Tax Exemptions	Sub-national	Tax expenditure	Cost of Intermediate Inputs	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Coal Conversion Tax Exemptions	Sub-national	Tax expenditure	Cost of Intermediate Inputs	Producer Support Estimate	Extraction or mining stage	Electricity-based support					OECD (2019)	Measure still active but no data available
Coal Refuse Energy and Reclamation Tax Credit	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Anthracite	292,822	380,259	336,541	OECD (2019)	
Coal Refuse Energy and Reclamation Tax Credit	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Other bituminous coal	7,207,178	9,619,741	8,413,460	OECD (2019)	
Coal Royalty Rate Reduction - Category 5 Qualification	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Coal Royalty Rate Reduction - Category 5 Qualification	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Coal Royalty Rate Reduction - Category 5 Qualification	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Industrial Expansion and Revitalization Credit	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Other bituminous coal	52,500,000	48,000,000	50,250,000	OECD (2019)	
Credit for Reducing Utility Charges	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Reduced Tax for Thin-Seamed Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	30,000,000	40,000,000	35,000,000	OECD (2019)	
Sales Tax Exemption for Coal	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Coal consumption (business and industry)	Coal	Anthracite	5,130,245	5,046,041	5,088,143	OECD (2019)	Measure benefits both households and companies, but allocated to companies as likely to mostly benefit them.
Sales Tax Exemption for Coal	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Coal consumption (business and industry)	Coal	Other bituminous coal	126,269,755	127,653,959	126,961,857	OECD (2019)	Measure benefits both households and companies, but allocated to companies as likely to mostly benefit them.
Sales Tax Exemption for Residential Utilities	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Electricity consumption (households)	Electricity-based support		428,400,000	433,100,000	207,793,800	OECD (2019)	Multiplied by proportion of coal in the fossil fuel-based electricity mix. FF: 65.03%, coal: 31.37%; coal/FF: 48.24% (Source: IEA)
Sales Tax Exemption for Energy Used in Manufacturing	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Coal consumption (business and industry)	Coal	Other bituminous coal	0	57,686	28,843	OECD (2019)	
Thin Seam Tax Credit	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite	12,310	13,357	12,834	OECD (2019)	
Thin Seam Tax Credit	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal	400,581	501,442	451,012	OECD (2019)	
Thin Seam Tax Credit	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	1,787,109	1,785,201	1,786,155	OECD (2019)	

Coal Transportation Expense	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Transportation of fossil fuels (e.g., through pipelines)	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Coal Transportation Expense	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Transportation of fossil fuels (e.g., through pipelines)	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Coal Transportation Expense	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Transportation of fossil fuels (e.g., through pipelines)	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Excess of Percentage over Cost Depletion	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite	19,585	20,326	19,956	OECD (2019)	
Excess of Percentage over Cost Depletion	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal	637,288	763,064	700,176	OECD (2019)	
Excess of Percentage over Cost Depletion	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	2,843,128	2,716,610	2,779,869	OECD (2019)	
Coal Incentive Tax Credit	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Anthracite	19,585	19,745	19,665	OECD (2019)	
Coal Incentive Tax Credit	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Coking coal	637,288	741,262	689,275	OECD (2019)	
Coal Incentive Tax Credit	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Other bituminous coal	2,843,128	2,638,992	2,741,060	OECD (2019)	
Sales Tax Incentive for Alternative Fuel or Gasification Facilities	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Refining or processing stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Sales Tax Incentive for Alternative Fuel or Gasification Facilities	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Refining or processing stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Sales Tax Incentive for Alternative Fuel or Gasification Facilities	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Refining or processing stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Sales Tax Exemption for Energy and Energy Producing Fuels	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Coal consumption (business and industry)	Coal	Other bituminous coal	7,734,795	7,975,567	7,855,181	OECD (2019)	
Railroad Improvement Tax Credit	Sub-national	Tax expenditure	Capital	General Services Support Estimate	Transportation of fossil fuels (e.g., through pipelines)	Coal	Other bituminous coal	2,700,000	2,600,000	2,650,000	OECD (2019)	
Fossil Energy R&D	Federal	Budgetary transfer	Knowledge	General Services Support Estimate	Coal mining (R&D)	Coal	Other bituminous coal	651,295,196	646,372,679	648,833,938	OECD (2019)	
Alaska Affordable Heating Program	Sub-national	Budgetary transfer	Direct Consumption	Consumer Support Estimate	Electricity consumption (households)	Electricity-based support		1,122,215	0	270,678	OECD (2019)	Multiplied by proportion of coal in the fossil fuel-based electricity mix. FF: 65.03%, coal: 31.37%; coal/FF: 48.24% (Source: IEA)
Department for Energy Development and Independence	Sub-national	Budgetary transfer	Knowledge	General Services Support Estimate	Extraction or mining stage	Coal	Anthracite	8,566	4,475	6,521	OECD (2019)	
Department for Energy Development and Independence	Sub-national	Budgetary transfer	Knowledge	General Services Support Estimate	Extraction or mining stage	Coal	Coking coal	278,750	168,011	223,381	OECD (2019)	
Department for Energy Development and Independence	Sub-national	Budgetary transfer	Knowledge	General Services Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	1,243,587	598,142	920,865	OECD (2019)	
Coal Academy Mining Workforce Development	Sub-national	Budgetary transfer	Labour	General Services Support Estimate	Extraction or mining stage	Coal	Anthracite	16,787	17,422	17,105	OECD (2019)	
Coal Academy Mining Workforce Development	Sub-national	Budgetary transfer	Labour	General Services Support Estimate	Extraction or mining stage	Coal	Coking coal	546,247	654,055	600,151	OECD (2019)	

Coal Academy Mining Workforce Development	Sub-national	Budgetary transfer	Labour	General Services Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	2,436,966	2,328,523	2,382,745	OECD (2019)	
Mine Safety and Licensing	Sub-national	Budgetary transfer	Labour	General Services Support Estimate	Extraction or mining stage	Coal	Anthracite	54,643	58,163	56,403	OECD (2019)	
Mine Safety and Licensing	Sub-national	Budgetary transfer	Labour	General Services Support Estimate	Extraction or mining stage	Coal	Coking coal	1,778,081	2,183,528	1,980,805	OECD (2019)	
Mine Safety and Licensing	Sub-national	Budgetary transfer	Labour	General Services Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	7,932,542	7,773,650	7,853,096	OECD (2019)	
Coal Development Trust Fund	Sub-national	Budgetary transfer	Land and natural resources	General Services Support Estimate	Extraction or mining stage	Coal	Lignite	3,136,599	3,081,651	3,109,125	OECD (2019)	
Abandoned Mine Reclamation Fund	Sub-national	Budgetary transfer	Land and natural resources	General Services Support Estimate	Extraction or mining stage	Coal	Lignite	2,796,000	2,793,000	2,794,500	OECD (2019)	
Capital Gains Treatment of Royalties on Coal	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite	458,061	483,855	470,958	OECD (2019)	
Capital Gains Treatment of Royalties on Coal	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal	14,905,248	18,164,655	16,534,952	OECD (2019)	
Capital Gains Treatment of Royalties on Coal	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	66,496,697	64,668,578	65,582,638	OECD (2019)	
Capital Gains Treatment of Royalties on Coal	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Sub-bituminous coal	58,631,764	58,171,538	58,401,651	OECD (2019)	
Capital Gains Treatment of Royalties on Coal	Federal	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Lignite	9,508,230	8,511,374	9,009,802	OECD (2019)	
Excess of Percentage over Cost Depletion	Federal	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite	548,789	570,786	559,788	OECD (2019)	
Excess of Percentage over Cost Depletion	Federal	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal	17,857,525	21,428,170	19,642,848	OECD (2019)	
Excess of Percentage over Cost Depletion	Federal	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	79,667,671	76,287,122	77,977,397	OECD (2019)	
Excess of Percentage over Cost Depletion	Federal	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Sub-bituminous coal	70,244,933	68,622,804	69,433,869	OECD (2019)	
Excess of Percentage over Cost Depletion	Federal	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Lignite	11,391,521	10,040,551	10,716,036	OECD (2019)	
Nonrefundable Tax Credit for the Purchase of Oklahoma Mined Coal	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Other bituminous coal	3,998,000	3,109,000	3,553,500	OECD (2019)	
Sales tax exemption for coal	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Sales tax exemption for coal	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Sales tax exemption for coal	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Mineral Resources and Mapping Program	Sub-national	Tax expenditure	Knowledge	General Services Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Mineral Resources and Mapping Program	Sub-national	Tax expenditure	Knowledge	General Services Support Estimate	Extraction or mining stage	Coal	Sub-bituminous coal				OECD (2019)	Measure still active but no data available
Coal Used in the Manufacture of Electricity	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Coal	Other bituminous coal	33,800,000	35,900,000	34,850,000	OECD (2019)	
Sales of Electricity	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Use of fossil fuels in electricity generation	Electricity-based support		150,000,000		72,360,000	OECD (2019)	Support for electricity producers. Multiplied by proportion of coal in the fossil fuel-based electricity mix. FF: 65.03%, coal: 31.37%; coal/FF: 48.24% (Source: IEA)
Sales and Use Tax Exemption for Electricity	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Electricity consumption (mixed or unclear)	Electricity-based support		38,500,000		18,572,400	OECD (2019)	Multiplied by proportion of coal in the fossil fuel-based electricity mix. FF: 65.03%, coal: 31.37%; coal/FF: 48.24% (Source: IEA)

Sales Tax Exemption for Natural Gas and Electricity for Residential Sector	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Electricity consumption (households)	Electricity-based support		692,054,109	581,039,410	307,070,157	OECD (2019)	Multiplied by proportion of coal in the fossil fuel-based electricity mix. FF: 65.03%, coal: 31.37%; coal/FF: 48.24% (Source: IEA)
Electricity Used in Oil De-watering Projects	Sub-national	Tax expenditure	Direct Consumption	Producer Support Estimate	Extraction or mining stage	Electricity-based support					OECD (2019)	Measure still active but no data available
Sales-Tax Exclusion for Purchase of Electric Power or Energy for Non-residential Use	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Electricity consumption (business and industry)	Electricity-based support		138,288,865	45,681,993	44,373,771	OECD (2019)	Multiplied by proportion of coal in the fossil fuel-based electricity mix. FF: 65.03%, coal: 31.37%; coal/FF: 48.24% (Source: IEA)
Impact Assistance Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Severance-Tax Reduction for Underground Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite	1,819,000		1,819,000	OECD (2019)	In absence of data for 2017, the 2016 estimate was taken as the annual value.
Severance-Tax Reduction for Underground Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal	1,819,000		1,819,000	OECD (2019)	In absence of data for 2017, the 2016 estimate was taken as the annual value.
Severance-Tax Reduction for Underground Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	1,819,000		1,819,000	OECD (2019)	In absence of data for 2017, the 2016 estimate was taken as the annual value.
Severance-Tax Reduction for Lignite	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Lignite				OECD (2019)	Measure still active but no data available
Severance-Tax Exemption for Low-Volume Coal Mining	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite	3,626,000		3,626,000	OECD (2019)	In absence of data for 2017, the 2016 estimate was taken as the annual value.
Severance-Tax Exemption for Low-Volume Coal Mining	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal	3,626,000		3,626,000	OECD (2019)	In absence of data for 2017, the 2016 estimate was taken as the annual value.
Severance-Tax Exemption for Low-Volume Coal Mining	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal	3,626,000		3,626,000	OECD (2019)	In absence of data for 2017, the 2016 estimate was taken as the annual value.
Coal Used to Burn Solid Waste	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Other end uses of fossil fuels	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Coal Used to Burn Solid Waste	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Other end uses of fossil fuels	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Coal Used to Burn Solid Waste	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Other end uses of fossil fuels	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Sales-Tax Exemption on Energy for Residential Use	Sub-national	Tax expenditure	Direct Consumption	Consumer Support Estimate	Electricity consumption (households)	Electricity-based support					OECD (2019)	Measure still active but no data available
Coal Waste Removal Tax Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Coal Waste Removal Tax Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Coal Waste Removal Tax Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Realty-Transfer Tax Exemption for Resource Leases	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Realty-Transfer Tax Exemption for Resource Leases	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Realty-Transfer Tax Exemption for Resource Leases	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available

Alternative Energy Production Tax Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Alternative Energy Production Tax Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Alternative Energy Production Tax Credit	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Severance-Tax Reduction for Underground Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Severance-Tax Reduction for Underground Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Severance-Tax Reduction for Underground Coal	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Severance-Tax Exemption for Coal Used as Process Energy	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Severance-Tax Exemption for Coal Used as Process Energy	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Severance-Tax Exemption for Coal Used as Process Energy	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Property-Tax Exemption for Underground Coal-Mining Equipment	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Property-Tax Exemption for Underground Coal-Mining Equipment	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Property-Tax Exemption for Underground Coal-Mining Equipment	Sub-national	Tax expenditure	Land and natural resources	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
Sales-Tax Exemption for Coal-Gasification Equipment	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Anthracite				OECD (2019)	Measure still active but no data available
Sales-Tax Exemption for Coal-Gasification Equipment	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Coking coal				OECD (2019)	Measure still active but no data available
Sales-Tax Exemption for Coal-Gasification Equipment	Sub-national	Tax expenditure	Capital	Producer Support Estimate	Extraction or mining stage	Coal	Other bituminous coal				OECD (2019)	Measure still active but no data available
TOTAL								**2,744,767,389**	**2,342,346,387**			

附件 26

TARUN RAIZADA HOUSTON

Ethylene oxide

USES

Ethylene oxide (EO) is mainly used to make ethylene glycol (EG), which accounts for three-quarters of global EO consumption. The second largest outlet is in surface active agents, including non-ionic alkylphenol ethoxylates and detergent alcohol ethoxylates.

Monoethylene glycol (MEG) is used in polyester fibres, resins and antifreeze formulations, and polyethylene terephthalate (PET) film for packaging. Diethylene glycol (DEG) is used in polyols, unsaturated polyester resins and plasticizers. Triethylene glycol (TEG) is used in natural gas dehydration and as a dehumidifier.

Other EO derivatives include glycol ethers (used in solvents and fuels), ethanolamines (used in surfactants and personal care products), polyols for polyurethane (PU) systems, polyethylene glycols (used in toothpaste and medicines) and polyalkylene glycols (used in antifoam agents and hydraulic lubricants).

EO is very explosive and difficult to transport over long distances.

SUPPLY/DEMAND

US EO supply is somewhat tight due to recent production issues in the first quarter and the impending start of the peak season in the downstream surfactants and PET sectors. The anticipated pick-up in demand from the downstream sectors will run from April to August.

Demand was also at a healthy level during the winter season as the downstream EG market was boosted by winter weather, which drove antifreeze sales.

Sasol's $11bn Lake Charles Chemicals Project (LCCP) in the US is 81% complete, and the company is scheduled to start up its first units at the site in the second half of 2018. LCCP consists of a 1.5m tonne/year ethane cracker, as well as six downstream facilities. The EO/EG unit will have a capacity of 300,000 tonnes/year of crude EO and 250,000 tonnes/year of MEG and associated higher glycols. US cracker capacity is expected to increase by 35% by 2019, taking into account new cracker projects and expansions of existing crackers.

In Mexico, Pemex's output of EO reached 218,000 tonnes in 2017, down from 294,000 tonnes in 2016. The state giant is struggling to supply feedstock ethylene to its downstream units following its contractual pledge to deliver ethane to Ethylene XXI, a $5.2bn JV between Brazil's Braskem and Mexico's Grupo Idesa.

Surfactants producers in Asia and elsewhere in the world may be in for a tough time on account of lacklustre demand growth, global overcapacity and an increasingly stringent regulatory environment, especially in China.

PRICES

EO contract prices for March fell from February following a decline in the feedstock ethylene contract for March. The ethylene contract typically settles at the beginning of the month for the previous month, and the EO contract price moves in tandem with ethylene. The majority of EO contracts are formula-based, and price movement comprises 80% of the change in the ethylene price and an additional conversion fee, or adder.

The March EO contract settled at 51.60-61.10 cents/lb free on board (FOB), a decrease of 1.40 cents/lb from February.

US spot feedstock ethylene prices have fallen to their lowest point in nine years as production continues to be bolstered by new crackers and demand is hampered by downstream outages.

TECHNOLOGY

EO was first manufactured using ethylene chlorohydrin as an intermediate, but this route has been superseded by the direct oxidation of ethylene with air or oxygen. Ethylene, compressed oxygen and recycled gas are mixed and fed to a multitubular catalytic reactor. The mixture is passed over a silver oxide catalyst at 200-300°C and 10-30 bar. The resulting gases from the reactor are cooled and then passed through a scrubber where the EO is absorbed, and can go straight to glycol production or be purified to produce other EO derivatives.

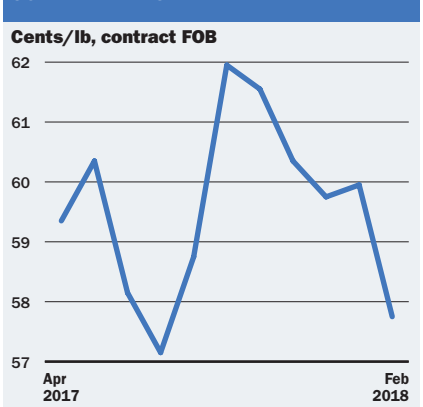
A crude EG mixture is produced by the hydrolysis of EO with water under pressure. Fractional distillation under vacuum separates the MEG from DEG and TEG.

OUTLOOK

EO supply is expected to be tighter by the start of summer, driven by several EO/EG turnarounds and higher demand from the onset of the peak downstream surfactants season. Turnarounds are generally scheduled after the peak antifreeze season since demand tends to be slower. In addition, demand from downstream EG is also expected to see a pick-up from the PET market, which has its peak season from April to August. PET is a major outlet for EG.

Feedstock ethylene supply may become more snug as downstream polyethylene (PE) outages wrap up and as new PE plants increase production. ■

US ETHYLENE OXIDE



US ETHYLENE OXIDE CAPACITY '000 TONNES/YEAR

Company	Location	Capacity
Shell Chemicals	Geismar, Louisiana	715
Dow Chemical	Taft, Louisiana	700
Huntsman	Port Neches, Texas	580
Indorama Ventures	Clear Lake, Texas	435
Dow Chemical	Seadrift, Texas	420
Equistar Chemicals	Bayport, Texas	380
Dow Chemical	Plaquemine, Louisiana	270

NOTE: Top seven listed

A full list of plants and projects capacities, forecasts, production volumes and operating rates are available on the **ICIS Supply and Demand database**

Access the archive of the Chemical Profiles A-Z at **icis.com/subscriber/icb**

JESSIE WALDHEIM HOUSTON

Ethylene

USES

Ethylene is used in the manufacture of polyethylene (PE), polyester, polyvinyl chloride (PVC), polystyrene (PS) and ethylene oxide (EO), as well as fibres and other organic chemicals. PE accounts for 60% of global ethylene demand.

SUPPLY/DEMAND

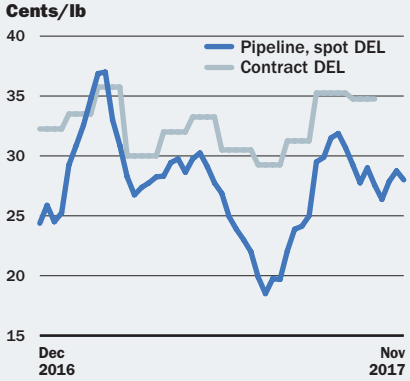
US ethylene supply is expected to tighten late in 2017 as new downstream capacity has come online ahead of expected new ethylene capacity. Three new crackers and one idled cracker had been expected to come online late in 2017. One cracker started up in September, but the others are now expected in early 2018. Some of the companies building these projects cited Hurricane Harvey for the delays.

The hurricane in late August caused ethylene outages along the Texas coast into Louisiana. While most units were back online within weeks, several outages continued into Q4. The hurricane also caused outages in downstream markets, which took some pressure off supply levels during Q3.

Ethylene inventory levels at the close of Q3 had increased from the prior quarter and from the prior year, according to the American Fuel & Petrochemical Manufacturers (AFPM).

Earlier in 2017, ethylene supplies also had tightened due to a combination of offline crackers and strong consumption into PE during Q1 and part of Q2. However, ethylene supplies lengthened in the middle of the year as outages resolved and as PE consumption eased.

US ETHYLENE



PRICES

Prices peaked in 2017 during Q1, amid turnarounds and outages at several US Gulf crackers and strong downstream consumption. In February, spot prices had risen to to a high of 36-38 cents/lb and contract prices to a high of 35.75 cents/lb.

Prices moderated in Q2 as outages resolved and continued falling into the middle of the year as the several expected downstream projects had not started up by mid-year.

Hurricane Harvey in Q3 pushed prices higher, although the post-hurricane high in late September remained below the peak in February.

TECHNOLOGY

Commercial production of ethylene is carried out by steam cracking hydrocarbon feedstocks. Natural gas liquids (NGLs) ethane and propane are the primary feedstocks in the US due to their abundance from shale gas, while oil-based naphtha is the primary feedstock in Europe and Asia.

OUTLOOK

With the delay of several cracker projects into early 2018, ethylene supply is expected to be tight early in the year. While Dow started up its cracker in Freeport, Texas, in September, the start-up of three other projects was postponed. These are:

- ExxonMobil at Baytown, Texas (1.5m tonnes/year expected mid-2018, previously end 2017)
- Chevron Phillips Chemical at Cedar Bayou, Texas (1.5m tonnes/year expected Q1 2018, previously end 2017)
- Indorama at Lake Charles, Louisiana (370,000 tonnes/year expected early 2018, previously end 2017)

As these and other projects come online, supply could move into a more balanced or even a long position. Ethylene capacity is expected to expand by more than five million tonnes/year by mid-2018 with another three million tonnes/year planned by the end of 2018.

Other 2018 ethylene projects include:

- Formosa Plastics at Point Comfort, Texas (1.2m tonnes/year, expected Q2 2018)
- Shintech at Plaquemine, Louisiana (500,000 tonnes/year, expected early 2018)
- Sasol at Lake Charles, Louisiana (1.5m tonnes/year, expected H2 2018)

Supply is not expected to be constrained by feedstock ethane supply, which is expected to remain adequate. However, crude oil values are lower now than when many of these ethylene and related downstream projects were planned, which has narrowed the cost advantage US production receives from using ethane as a feedstock. ■

US ETHYLENE CAPACITY '000 TONNES/YEAR

Company	Location	Capacity
DowDuPont	Freeport, Texas	3,155
ExxonMobil	Baytown, Texas	2,200
Chevron Phillips	Sweeny, Texas	1,966
INEOS	Chocolate Bayou, Texas	1,907
LyondellBasell	Channelview, Texas	1,859
DowDuPont	Plaquemine, Louisiana	1,507
Formosa Plastics	Point Comfort, Texas	1,496
Shell	Norco, Louisiana	1,420
Westlake	Lake Charles, Louisiana	1,356
LyondellBasell	La Porte, Texas	1,152
LyondellBasell	Corpus Christi, Texas	1,134
BASF Total	Port Arthur, Texas	1,040
ExxonMobil	Baton Rouge, Louisiana	1,000
DowDuPont	Taft, Louisiana	990
ExxonMobil	Beaumont, Texas	900
NOVA Chemicals	Geismar, Louisiana	885
Shell	Deer Park, Texas	835
Chevron Phillips	Cedar Bayou, Texas	803
Chevron Phillips	Port Arthur, Texas	803
DowDuPont	Orange, Texas	680
Eastman	Longview, Texas	640
Flint Hills Resources	Port Arthur, Texas	621
LyondellBasell	Morris, Illinois	549
Occidental Chemical/ Mexichem	Ingleside, Texas	544
Sasol	Lake Charles, Louisiana	482

NOTE: Top 25 listed

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JESSIE WALDHEIM HOUSTON

Propylene

USES

Propylene is mainly used to make polypropylene (PP), which accounts for about half of propylene consumption in the US. Other outlets for propylene include acrylonitrile (ACN), propylene oxide (PO), a number of alcohols, cumene and acrylic acid.

SUPPLY/DEMAND

US propylene supplies had been tight in early 2018 amid production issues and low inventory levels. Inventory levels had been low since late 2017, following the impact of Hurricane Harvey on production in the US Gulf coast. Multiple production units, both including crackers and refineries, were taken off line during the late-August hurricane. Supplies were not immediately tightened as the hurricane also affected downstream plants.

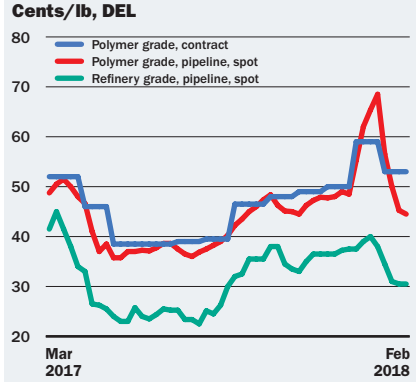
Many outages were resolved by late September. However some cracker outages continued into the fourth quarter and refinery operating rates remained below pre-Harvey levels into late November. As consumption levels had normalised by the fourth quarter, propylene supply was snug and inventory levels remained low.

Meanwhile, the propylene market continued to await the start-up of a new propane dehydrogenation (PDH) unit, which had faced several delays. A production outage for another PDH unit in late December, followed by a days-long outage for a third PDH unit in mid-January, further tightened supplies and caused propylene prices to spike.

Those high propylene prices caused downstream derivative prices to rise as well, which caused domestic derivatives to be less competitive against imported derivatives. Operating rates for downstream polypropylene (PP) fell as imports rose.

The lower propylene consumption allowed supply levels to recover and inventory levels began ticking higher in mid-January and continued to recover through much of February.

US PROPYLENE



PRICES

Propylene spot and contract prices rose sharply at the start of 2018, and in January reached their highest points since December 2014. The high prices were due largely to tight supplies following production issues. Spot prices for polymer-grade propylene (PGP) had diverged from refinery-grade propylene (RGP), as the production issues had centred around propane dehydrogenation (PDH) units, which produce PGP. RGP is rarely used for chemical derivatives, but is commonly used to produce PGP.

Historically, spot PGP has been valued about 10 cents/lb above spot RGP. However, amid a tight market for PGP and relatively balanced market for RGP, the spread widened to 30.5 cents/lb in late January. As the high-cost propylene affected downstream demand, consumption rates fell and propylene prices began to moderate. Propylene contract prices in February fell by 6 cents/lb, while spot PGP prices dropped by about 20 cents/lb in the three weeks following the late-January high point.

TECHNOLOGY

Propylene comes in three grades: polymer grade (99.5% minimum purity), chemical grade (93-94% minimum purity) and refinery grade (60-70% purity).

There are several routes to produce propylene, most commonly as a by-product of gasoline production in fluid catalytic cracking (FCC) units in refineries. Propylene also is a by-product steam cracking of liquid feedstocks such as ethane and naphtha. More than half the propylene produced in the US comes from refineries, while about a third comes from steam cracking.

On-purpose routes for propylene include metathesis, which converts ethylene into propylene, and PDH, which converts propane into propylene. While on-purpose systems have been a small part of domestic propylene production, it has been growing. Two 750,000 tonne/year PDH units were recently built in the US Gulf, one which started up in December 2015 and the other which was ramping up to full production as of late February.

US PROPYLENE CAPACITY '000 TONNES/YEAR

Company	Location	Capacity
LyondellBasell	Channelview, Texas	1,905
ExxonMobil Chemical	Baytown, Texas	1,700
DowDuPont	Freeport, Texas	1,430
ExxonMobil Chemical	Baton Rouge, Louisiana	1,275
Shell Chemicals	Norco, Louisiana	1,065
Flint Hills Resources	Houston, Texas	790
Enterprise Products	Mont Belvieu, Texas	750
BASF Total	Port Arthur, Texas	635
Formosa Plastics USA	Point Comfort, Texas	575
Chevron Phillips Chemical	Sweeny, Texas	545

Note: Top 10 sites

A full list of plants and projects capacities, forecasts, production volumes and operating rates are available on the **ICIS Supply and Demand database**

OUTLOOK

The US propylene market is expected to lengthen as several production projects are scheduled to be complete by the end of 2018, while no consumption projects are expected over the same timeline. This is a shift from recent years as propylene supply has been tight due to a move in the US towards lighter cracker feedstocks like ethane. Despite light feedstocks continuing to be favoured, several new cracker projects are expected to expand the volume of propylene produced.

In addition, a new 750,000 tonne/year PDH unit in the US Gulf is expected to be operating at full capacity. Another new 750,000 tonne/year PDH unit had started up in December 2015.

Meanwhile, strong demand for US gasoline exports is continuing to encourage strong operating rates for US refineries, which is resulting in good propylene production from refineries. ■

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Propylene Oxide

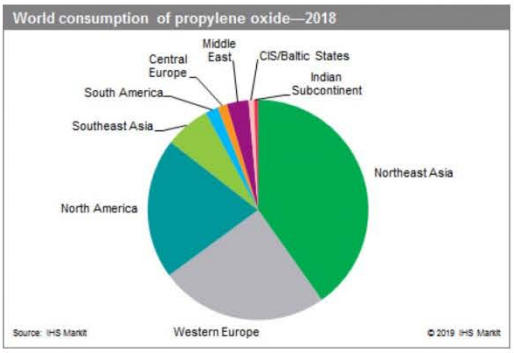
Chemical Economics Handbook

15 August 2019

Propylene oxide belongs to the epoxide family of products, and is used principally in the manufacture of polyether polyols, propylene glycols, glycol ethers, and polyalkylene glycols. Overall, propylene oxide consumption is broadly tied to the general economy and has been increasingly linked to emerging countries (China, in particular), where improvements in living standards are driving an increasing use of a wide range of polymers and chemicals.

The propylene oxide industry typically builds ahead of forecast demand, which can lead to periods of market tightness or length. Since 2013, PO capacity has increased at an average rate of 3% per year, driven mainly by new developments in Asia. Meanwhile, PO consumption has grown at a stronger pace (4.2% per year on average), leading to a tightening of markets and rising average operating rates across the propylene oxide industry. In 2018, the industry-wide utilization rate was estimated at 93%, up from the 88% recorded five years ago.

The following pie chart shows world consumption of propylene oxide in 2018:



The propylene oxide producer landscape appears fairly concentrated, with the five largest shareholders accounting for 51% of the global installed capacity. Dow Inc. (formerly Dow Chemical/DowDuPont) and LyondellBasell are, by far, the two major players on the global propylene oxide scene with several assets partially or fully owned in diverse parts of the world. The next-largest producers (on a shareholding basis) have a much smaller share of the market and include Shell, Covestro, SK, BASF, Saudi Aramco, SINOPEC, and Huntsman.

US PROPYLENE OXIDE CAPACITY '000 TONNES/YEAR

Company	Location	Capacity
Huntsman	Port Neches, Texas	240
LyondellBasell	Bayport, Texas	600
	Channelview, Texas	550
Dow	Plaquemine, Louisiana	330
	Freeport, Texas	725
TOTAL		2,445

SOURCE: ICIS

附件 27

Subsidy Tracker Parent Company Summary

Parent Company Name: DowDuPont

Ownership Structure: publicly traded (ticker symbol DWDP)

Headquartered in: Delaware

Major Industry: chemicals

Specific Industry: chemicals

Subsidy Summary	Subsidy Value	Number of Awards
State/Local	$1,758,332,070	471
Federal (grants and allocated tax credits)	$583,631,249	191
TOTAL	**$2,341,963,319**	**662**
Loan / Bailout Summary	**Total Face Value**	**Number of Awards**
State/Local loans, bond financing and venture capital	**$0**	**0**
Federal loans, loan guarantees and bailout assistance (not including repayments)	**$42,656,159**	**9**
TOTAL	**$42,656,159**	**9**

Subsidy Tracker Parent Company Summary

Parent Company Name: BASF

Ownership Structure: publicly traded

Headquartered in: Germany

Major Industry: chemicals

Specific Industry: chemicals

Subsidy Summary	Subsidy Value	Number of Awards
State/Local	$275,381,257	195
Federal (grants and allocated tax credits)	$63,784,043	74
TOTAL	**$339,165,300**	**269**
Loan / Bailout Summary	**Total Face Value**	**Number of Awards**
State/Local loans, bond financing and venture capital	**$1,000,000**	**1**
Federal loans, loan guarantees and bailout assistance (not including repayments)	**$89,000,000**	**2**
TOTAL	**$90,000,000**	**3**

Subsidy Tracker Parent Company Summary

Parent Company Name: Sasol

Ownership Structure: publicly traded (ticker symbol SSL)

Headquartered in: South Africa

Major Industry: chemicals

Specific Industry: chemicals

Subsidy Summary	Subsidy Value	Number of Awards
State/Local	$1,851,232,180	68
Federal (grants and allocated tax credits)	$0	0
TOTAL	**$1,851,232,180**	**68**
Loan / Bailout Summary	**Total Face Value**	**Number of Awards**
State/Local loans, bond financing and venture capital	**$0**	**0**
Federal loans, loan guarantees and bailout assistance (not including repayments)	**$0**	**0**
TOTAL	**$0**	**0**

Subsidy Tracker Parent Company Summary

Parent Company Name: Eastman Chemical

Ownership Structure: publicly traded (ticker symbol EMN)

Headquartered in: Tennessee

Major Industry: chemicals

Specific Industry: chemicals

Subsidy Summary	Subsidy Value	Number of Awards
State/Local	$133,257,466	27
Federal (grants and allocated tax credits)	$2,481,917	5
TOTAL	**$135,739,383**	**32**
Loan / Bailout Summary	**Total Face Value**	**Number of Awards**
State/Local loans, bond financing and venture capital	**$0**	**0**
Federal loans, loan guarantees and bailout assistance (not including repayments)	**$8,558,974**	**1**
TOTAL	**$8,558,974**	**1**

附件 28

World Freight Rates

News Payment Page

Freight Calculator

Get Instant, Free, Container Shipping Estimates, as well as Break Bulk, Bulk, and Project Cargo, from anywhere to anywhere in the World. We provide International Air shipment estimates, as well as Trucking Estimates in North America and the European Union (exclusive of the Scandinavian countries). WFR can help you or your business send anything from individual packages, boxes, or pallets, up to full containerloads, and more.

1. SELECT METHOD OF SHIPPING

- Containerized
- Break Bulk
- Project Cargo/ Heavy Lift
- Truck
- Air

2. SELECT LOCATIONS

Houston, United States

Shanghai, China

Chemicals

Before entering the Commodity Value, please select the Load Type of either FCL or LCL.

$50,000

3. SELECT LOAD

- FCL
- Container Type 20 FT
- LCL
- Refrigerated

4. ACCESSORIAL CHARGES

- Hazardous
- Add Insurance

GET RATE

Current Market Rate Estimate

$2,078.62 – $2,297.42

Subject to additional fees such as taxes, duties, etc..

进口货运保险普通货物费率表

（一）所有进口货物均按本费率表计算保险费，但如在指明货物资率表中的货物，承保一切险时还须加上指明货物资率计算保险费。有特殊规定的按特殊规定计收。

（二）各种散装货物以及化肥、糖、粮谷、木材、油（包括油料）、活牲畜、新鲜果菜，其保险责任均至卸货港口仓库或场地时终止。上述货物如需从港口转运到内地还需按转运内地费率加费的规定加费。

（三）本表系按每百元计算。

(1)海运

地区	平安险 F． P． A	水渍险 W． A	一切险 A． R．
台湾、香港、澳门、南朝鲜、日本	0． 08	0.12	0.25
大洋洲及亚洲国家和地区	0． 10	0.15	0.35
加拿大、美国、欧洲	0． 15	0.20	0.45
非洲及中南美洲	0． 20	0.25	0.50

(2)陆运

地区	陆运	陆运一切险
香港、澳门	0． 07	0． 20
其它地区	0． 15	0． 40

(3)空运

地区	航空运输险	航空一切险
香港、澳门、台湾、日本、南朝鲜	0． 10	0． 25
其他世界各地	0． 20	0． 45

(4)邮包

24小时新闻排行

1．不符变动成本货载 阳明海运不收
2．深圳码头全面停运
3．《出口退(免)税企业分类管理办...
4．运需不平衡，8月初欧地线涨价遇...
5．这四个国家为何都要拉中国入伙修...
6．实货变空箱，宁波查获巨额出口骗...
7．董家口港成为青岛市第二个一类海...
8．希腊船东Diana Shipp...
9．黄埔文冲4艘散货船遭拒收?!
10．一艘货船在长江宜宾南溪水域发生...

在线视频


辽宁卫视《辽宁新闻联播》报道第六届海峰
类别:媒体报道


大连财经频道《大连经济报道》关注货代平
类别:


大连电视台《大连新闻》报道第六届海峰会
类别:媒体报道


东方卫视报道第五届全球海运峰会
类别:媒体报道

航贸百科


危险货物标志


危险化学品标志

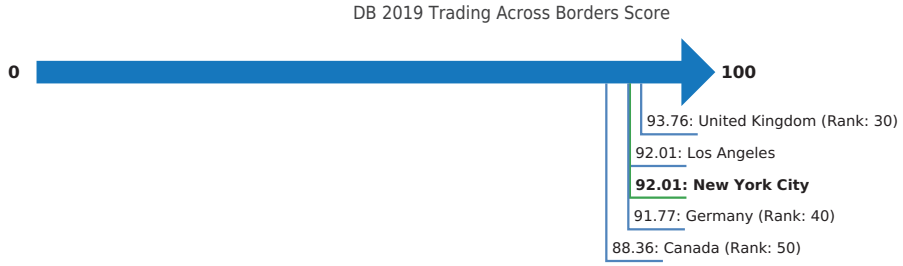
国际危规： 查询


A World Bank Group Flagship Report
16TH EDITION
DOING BUSINESS 2019
Training for Reform
Economy Profile
United States
STARTING A BUSINESS
REGISTERING PROPERTY
TRAINING
DISSEMINATION
CONTRACTS
GETTING CREDIT
TAXES
TRADING ACROSS BORDERS
WORLD BANK GROUP
Comparing Business Regulation for Domestic Firms in 190 Economies

Trading across Borders - New York City

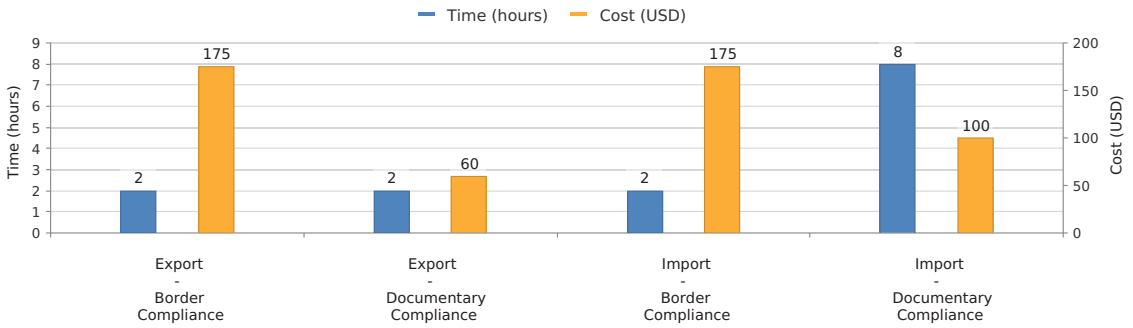
Indicator	New York City	OECD high income	Best Regulatory Performance
Time to export: Border compliance (hours)	2	12.5	1 (19 Economies)
Cost to export: Border compliance (USD)	175	139.1	0 (19 Economies)
Time to export: Documentary compliance (hours)	2	2.4	1 (26 Economies)
Cost to export: Documentary compliance (USD)	60	35.2	0 (20 Economies)
Time to import: Border compliance (hours)	2	8.5	0 (25 Economies)
Cost to import: Border compliance (USD)	175	100.2	0 (28 Economies)
Time to import: Documentary compliance (hours)	8	3.4	1 (30 Economies)
Cost to import: Documentary compliance (USD)	100	24.9	0 (30 Economies)

Figure – Trading across Borders in New York City and comparator economies – Ranking and Score



Note: The ranking of economies on the ease of trading across borders is determined by sorting their scores for trading across borders. These scores are the simple average of the scores for the time and cost for documentary compliance and border compliance to export and import.

Figure – Trading across Borders in New York City – Time and Cost



Details – Trading across Borders in New York City

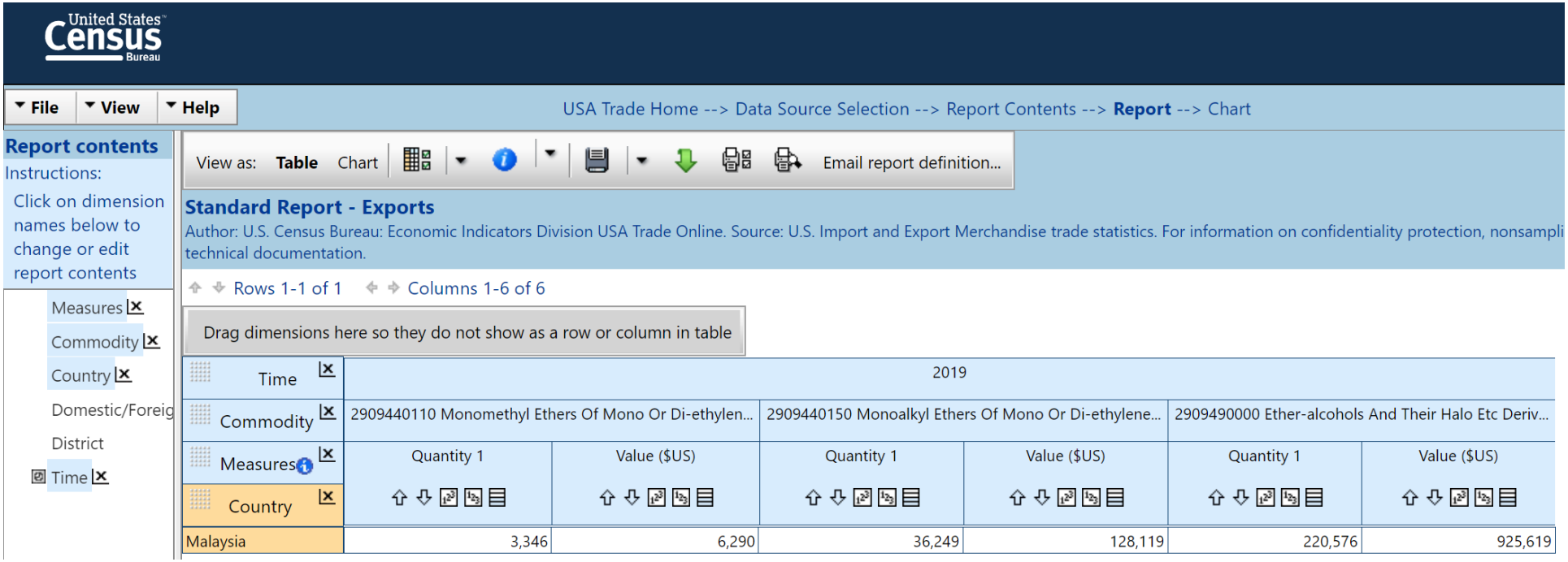
Characteristics	Export	Import
Product	HS 84 : Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	HS 8708: Parts and accessories of motor vehicles
Trade partner	Canada	Mexico
Border	Buffalo border crossing	Laredo border crossing
Distance (km)	600	3192
Domestic transport time (hours)	24	109
Domestic transport cost (USD)	1361	4373

Details – Trading across Borders in New York City – Components of Border Compliance

	Time to Complete (hours)	Associated Costs (USD)
Export: Clearance and inspections required by customs authorities	1.3	175.0
Export: Clearance and inspections required by agencies other than customs	0.0	0.0
Export: Port or border handling	0.5	0.0
Import: Clearance and inspections required by customs authorities	1.5	175.0
Import: Clearance and inspections required by agencies other than customs	0.0	0.0
Import: Port or border handling	0.5	0.0

附件 29

Commodity	2909440110 Monomethyl Ethers Of Mono Or Di-ethylene Glycols (kg)		2909440150 Monoalkyl Ethers Of Mono Or Di-ethylene Glyc Nesoi (kg)		2909490000 Ether-alcohols And Their Halo Etc Deriv Nesoi (kg)		合计		
Measures	Quantity 1	Value ($US)	Quantity 1	Value ($US)	Quantity 1	Value ($US)	Quantity (Ton)	Value ($US)	Unit Value ($US/Ton)
Malaysia	3,346	6,290	36,249	128,119	220,576	925,619	260	1,060,028	4,074



附件 30

非保密概要

附件 30：申请人同类产品生产、经营和财务数据。

本附件内容为申请书正文部分所提供的申请人的生产、经营和财务数据的底层数据及相关证明材料，属于申请人的商业秘密，故申请保密。

在申请书公开版本的正文部分，已经以指数形式提供了上述数据的非保密概要，其他利害关系方可以合理理解。

附件 31

2016/3/21	8,500	2017/3/17	10,300	2018/3/19	10,600
2016/3/22	8,500	2017/3/20	10,300	2018/3/20	10,600
2016/3/23	8,500	2017/3/21	10,300	2018/3/21	10,600
2016/3/24	8,500	2017/3/22	10,300	2018/3/22	10,600
2016/3/25	8,500	2017/3/23	9,500	2018/3/23	10,600
2016/3/28	9,000	2017/3/24	9,500	2018/3/26	10,600
2016/3/29	9,000	2017/3/27	9,500	2018/3/27	10,600
2016/3/30	9,000	2017/3/28	9,500	2018/3/28	10,600
2016/3/31	9,000	2017/3/29	9,500	2018/3/29	10,600
2016/4/1	9,000	2017/3/30	9,500	2018/3/30	10,600
2016/4/5	9,000	2017/3/31	9,500	2018/4/2	10,600
2016/4/6	9,000	2017/4/1	9,500	2018/4/3	10,600
2016/4/7	9,000	2017/4/5	9,500	2018/4/4	10,600
2016/4/8	9,000	2017/4/6	9,500	2018/4/8	10,600
2016/4/11	9,000	2017/4/7	9,500	2018/4/9	10,600
2016/4/12	9,000	2017/4/10	9,500	2018/4/10	10,600
2016/4/13	9,000	2017/4/11	9,500	2018/4/11	10,600
2016/4/14	9,000	2017/4/12	9,500	2018/4/12	10,600
2016/4/15	9,000	2017/4/13	9,500	2018/4/13	10,600
2016/4/18	9,000	2017/4/14	9,500	2018/4/16	10,600
2016/4/19	9,000	2017/4/17	9,500	2018/4/17	10,600
2016/4/20	9,000	2017/4/18	9,500	2018/4/18	10,600
2016/4/21	9,000	2017/4/19	9,500	2018/4/19	10,600
2016/4/22	9,000	2017/4/20	9,500	2018/4/20	10,600
2016/4/25	9,000	2017/4/21	9,500	2018/4/23	10,600
2016/4/26	9,000	2017/4/24	9,500	2018/4/24	10,600
2016/4/27	9,000	2017/4/25	9,700	2018/4/25	10,800
2016/4/28	9,000	2017/4/26	9,700	2018/4/26	10,800
2016/4/29	9,000	2017/4/27	9,700	2018/4/27	10,800
2016/5/3	9,000	2017/4/28	9,700	2018/4/28	10,800
2016/5/4	9,000	2017/5/2	9,700	2018/5/2	10,800
2016/5/5	9,000	2017/5/3	9,700	2018/5/3	10,800
2016/5/6	9,000	2017/5/4	9,700	2018/5/4	10,800
2016/5/9	9,000	2017/5/5	9,700	2018/5/7	10,800
2016/5/10	9,000	2017/5/8	9,700	2018/5/8	10,800
2016/5/11	9,000	2017/5/9	9,700	2018/5/9	10,800
2016/5/12	9,000	2017/5/10	9,700	2018/5/10	10,800
2016/5/13	9,000	2017/5/11	9,700	2018/5/11	10,800
2016/5/16	9,000	2017/5/12	9,700	2018/5/14	10,800
2016/5/17	9,000	2017/5/15	9,700	2018/5/15	10,800
2016/5/18	9,000	2017/5/16	9,700	2018/5/16	10,800
2016/5/19	9,000	2017/5/17	9,700	2018/5/17	10,800
2016/5/20	8,400	2017/5/18	9,700	2018/5/18	10,800
2016/5/23	8,400	2017/5/19	9,700	2018/5/21	10,800
2016/5/24	8,400	2017/5/22	9,700	2018/5/22	10,800
2016/5/25	8,400	2017/5/23	9,700	2018/5/23	10,800
2016/5/26	8,400	2017/5/24	9,700	2018/5/24	10,800
2016/5/27	8,400	2017/5/25	9,700	2018/5/25	10,800
2016/5/30	8,400	2017/5/26	9,700	2018/5/28	10,800
2016/5/31	8,400	2017/5/31	9,700	2018/5/29	10,800
2016/6/1	8,400	2017/6/1	9,700	2018/5/30	10,800

	元/吨		元/吨		元/吨		元/吨
2016均价	**8,554**	**2017均价**	**9,769**	**2018均价**	**10,298**	**2019均价**	**7,749**
2016/1/1	7,500	2017/1/3	9,300	2018/1/2	10,600	2019年四季度	7,716
2016/1/4	7,500	2017/1/4	9,300	2018/1/3	10,600	2019年三季度	7,724
2016/1/5	7,500	2017/1/5	9,600	2018/1/4	10,600	2019年二季度	7,581
2016/1/6	7,500	2017/1/6	9,600	2018/1/5	10,600	2019年一季度	7,975
2016/1/7	7,500	2017/1/9	9,600	2018/1/8	10,600		
2016/1/8	7,500	2017/1/10	9,600	2018/1/9	10,600		
2016/1/11	7,500	2017/1/11	9,600	2018/1/10	10,600		
2016/1/12	7,500	2017/1/12	9,600	2018/1/11	10,600		
2016/1/13	7,500	2017/1/13	9,600	2018/1/12	10,600		
2016/1/14	7,500	2017/1/16	9,600	2018/1/15	10,600		
2016/1/15	7,500	2017/1/17	9,600	2018/1/16	10,600		
2016/1/18	7,500	2017/1/18	9,600	2018/1/17	10,600		
2016/1/19	7,500	2017/1/19	9,600	2018/1/18	10,600		
2016/1/20	7,500	2017/1/20	9,600	2018/1/19	10,600		
2016/1/21	7,500	2017/1/21	9,600	2018/1/22	10,600		
2016/1/22	7,500	2017/1/22	9,600	2018/1/23	10,600		
2016/1/25	7,500	2017/1/23	9,600	2018/1/24	10,600		
2016/1/26	7,500	2017/1/24	9,600	2018/1/25	10,600		
2016/1/27	7,500	2017/2/3	9,600	2018/1/26	10,600		
2016/1/28	7,500	2017/2/4	10,100	2018/1/29	10,600		
2016/1/29	7,500	2017/2/6	10,100	2018/1/30	10,600		
2016/2/1	6,900	2017/2/7	10,100	2018/1/31	10,600		
2016/2/2	6,900	2017/2/8	10,100	2018/2/1	10,600		
2016/2/3	6,900	2017/2/9	10,100	2018/2/2	10,600		
2016/2/15	6,900	2017/2/10	10,600	2018/2/5	10,600		
2016/2/16	6,900	2017/2/13	10,600	2018/2/6	10,600		
2016/2/17	6,900	2017/2/14	10,600	2018/2/7	10,600		
2016/2/18	6,900	2017/2/15	10,600	2018/2/8	10,600		
2016/2/19	6,900	2017/2/16	11,100	2018/2/9	10,600		
2016/2/22	6,900	2017/2/17	11,100	2018/2/11	10,600		
2016/2/23	6,900	2017/2/20	11,100	2018/2/12	10,400		
2016/2/24	6,900	2017/2/21	11,100	2018/2/13	10,400		
2016/2/25	6,900	2017/2/22	11,100	2018/2/22	10,400		
2016/2/26	6,900	2017/2/23	11,100	2018/2/23	10,400		
2016/2/29	7,200	2017/2/24	11,100	2018/2/24	10,400		
2016/3/1	7,200	2017/2/27	11,100	2018/2/26	10,400		
2016/3/2	7,200	2017/2/28	11,100	2018/2/27	10,400		
2016/3/3	7,200	2017/3/1	11,100	2018/2/28	10,600		
2016/3/4	7,200	2017/3/2	11,100	2018/3/1	10,600		
2016/3/7	7,200	2017/3/3	11,100	2018/3/2	10,600		
2016/3/8	7,500	2017/3/6	11,100	2018/3/6	10,600		
2016/3/9	7,500	2017/3/7	11,100	2018/3/7	10,600		
2016/3/10	7,500	2017/3/8	11,100	2018/3/8	10,600		
2016/3/11	7,500	2017/3/9	11,100	2018/3/9	10,600		
2016/3/14	8,000	2017/3/10	11,100	2018/3/12	10,600		
2016/3/15	8,000	2017/3/13	11,100	2018/3/13	10,600		
2016/3/16	8,000	2017/3/14	11,100	2018/3/14	10,600		
2016/3/17	8,000	2017/3/15	11,100	2018/3/15	10,600		
2016/3/18	8,500	2017/3/16	10,300	2018/3/16	10,600		

2016/8/15	9,100	2017/8/14	9,500	2018/8/13	10,300
2016/8/16	9,100	2017/8/15	9,500	2018/8/14	10,300
2016/8/17	9,100	2017/8/16	9,500	2018/8/15	10,300
2016/8/18	9,100	2017/8/17	9,500	2018/8/16	10,300
2016/8/19	9,100	2017/8/18	9,500	2018/8/17	10,500
2016/8/22	9,100	2017/8/21	9,500	2018/8/20	10,500
2016/8/23	9,100	2017/8/22	9,500	2018/8/21	10,500
2016/8/24	9,100	2017/8/23	9,500	2018/8/22	10,500
2016/8/25	9,100	2017/8/24	9,500	2018/8/23	10,500
2016/8/26	9,100	2017/8/25	9,500	2018/8/24	10,500
2016/8/29	9,100	2017/8/28	9,500	2018/8/27	10,700
2016/8/30	9,100	2017/8/29	9,500	2018/8/28	10,700
2016/8/31	9,100	2017/8/30	9,500	2018/8/29	10,700
2016/9/1	9,100	2017/8/31	9,800	2018/8/30	10,700
2016/9/2	9,100	2017/9/1	9,800	2018/8/31	10,700
2016/9/5	9,100	2017/9/4	9,800	2018/9/3	10,700
2016/9/6	9,100	2017/9/5	9,800	2018/9/4	10,900
2016/9/7	9,100	2017/9/6	9,800	2018/9/5	10,900
2016/9/8	9,100	2017/9/7	9,800	2018/9/6	10,900
2016/9/9	9,100	2017/9/8	9,800	2018/9/7	10,900
2016/9/12	9,100	2017/9/11	9,800	2018/9/10	10,900
2016/9/13	9,100	2017/9/12	9,800	2018/9/11	10,900
2016/9/14	9,100	2017/9/13	9,800	2018/9/12	10,900
2016/9/18	9,100	2017/9/14	9,800	2018/9/13	10,900
2016/9/19	9,100	2017/9/15	9,800	2018/9/14	10,900
2016/9/20	9,100	2017/9/18	9,800	2018/9/17	10,900
2016/9/21	9,100	2017/9/19	9,800	2018/9/18	10,900
2016/9/22	9,100	2017/9/20	9,800	2018/9/19	10,900
2016/9/23	9,100	2017/9/21	9,800	2018/9/20	10,900
2016/9/26	9,100	2017/9/22	9,800	2018/9/21	10,900
2016/9/27	9,100	2017/9/25	9,800	2018/9/25	10,900
2016/9/28	9,100	2017/9/26	9,800	2018/9/26	10,900
2016/9/29	9,100	2017/9/27	9,800	2018/9/27	10,900
2016/9/30	8,800	2017/9/28	9,800	2018/9/28	10,900
2016/10/8	8,800	2017/9/29	9,800	2018/9/29	10,900
2016/10/9	8,800	2017/9/30	9,800	2018/9/30	10,900
2016/10/10	8,800	2017/10/2	9,800	2018/10/8	10,400
2016/10/11	8,800	2017/10/3	9,800	2018/10/9	10,400
2016/10/12	8,800	2017/10/4	9,800	2018/10/10	10,400
2016/10/13	8,800	2017/10/5	9,800	2018/10/11	10,400
2016/10/14	8,800	2017/10/6	9,800	2018/10/12	10,400
2016/10/17	8,800	2017/10/9	9,800	2018/10/15	10,400
2016/10/18	8,800	2017/10/10	9,800	2018/10/16	10,400
2016/10/19	8,800	2017/10/11	9,800	2018/10/17	10,400
2016/10/20	8,800	2017/10/12	9,800	2018/10/18	10,400
2016/10/21	8,800	2017/10/13	9,800	2018/10/19	10,400
2016/10/24	8,800	2017/10/16	9,800	2018/10/22	10,400
2016/10/25	8,800	2017/10/17	9,800	2018/10/23	10,400
2016/10/26	8,800	2017/10/18	9,800	2018/10/24	10,400
2016/10/27	8,800	2017/10/19	9,800	2018/10/25	10,400
2016/10/28	8,800	2017/10/20	9,800	2018/10/26	10,400

2016/6/2	8,400	2017/6/2	9,700	2018/5/31	10,800
2016/6/3	8,400	2017/6/5	9,700	2018/6/1	10,800
2016/6/6	8,400	2017/6/6	9,100	2018/6/4	10,800
2016/6/7	8,400	2017/6/7	9,100	2018/6/5	10,800
2016/6/8	8,400	2017/6/8	9,100	2018/6/6	10,800
2016/6/12	8,400	2017/6/9	9,100	2018/6/7	10,800
2016/6/13	8,400	2017/6/12	8,600	2018/6/8	10,800
2016/6/14	8,400	2017/6/13	8,600	2018/6/11	10,800
2016/6/15	8,400	2017/6/14	8,600	2018/6/12	10,800
2016/6/16	8,400	2017/6/15	8,600	2018/6/13	10,200
2016/6/17	8,400	2017/6/16	8,600	2018/6/14	10,200
2016/6/20	8,400	2017/6/19	8,600	2018/6/15	10,200
2016/6/21	8,400	2017/6/20	8,600	2018/6/19	10,200
2016/6/22	8,400	2017/6/21	8,600	2018/6/20	9,700
2016/6/23	8,400	2017/6/22	8,600	2018/6/21	9,700
2016/6/24	8,400	2017/6/23	8,600	2018/6/22	9,700
2016/6/27	8,400	2017/6/26	8,600	2018/6/25	9,700
2016/6/28	8,400	2017/6/27	8,600	2018/6/26	9,700
2016/6/29	8,400	2017/6/28	8,600	2018/6/27	9,700
2016/6/30	8,400	2017/6/29	8,600	2018/6/28	9,700
2016/7/1	8,400	2017/6/30	8,600	2018/6/29	9,700
2016/7/4	8,400	2017/7/3	8,600	2018/7/2	9,700
2016/7/5	8,400	2017/7/4	8,600	2018/7/3	9,700
2016/7/6	8,400	2017/7/5	8,600	2018/7/4	9,700
2016/7/7	8,700	2017/7/6	8,600	2018/7/5	9,700
2016/7/8	8,700	2017/7/7	8,600	2018/7/6	9,700
2016/7/11	8,700	2017/7/10	8,600	2018/7/9	9,700
2016/7/12	8,700	2017/7/11	8,600	2018/7/10	9,700
2016/7/13	8,700	2017/7/12	8,600	2018/7/11	9,700
2016/7/14	8,700	2017/7/13	8,600	2018/7/12	9,700
2016/7/15	8,700	2017/7/14	8,600	2018/7/13	9,700
2016/7/18	8,700	2017/7/17	8,600	2018/7/16	9,700
2016/7/19	9,100	2017/7/18	8,600	2018/7/17	9,700
2016/7/20	9,100	2017/7/19	8,600	2018/7/18	9,700
2016/7/21	9,100	2017/7/20	8,800	2018/7/19	9,900
2016/7/22	9,100	2017/7/21	8,800	2018/7/20	9,900
2016/7/25	9,100	2017/7/24	8,800	2018/7/23	9,900
2016/7/26	9,100	2017/7/25	8,800	2018/7/24	9,900
2016/7/27	9,100	2017/7/26	8,800	2018/7/25	9,900
2016/7/28	9,100	2017/7/27	8,800	2018/7/26	9,900
2016/7/29	9,100	2017/7/28	8,800	2018/7/27	9,900
2016/8/1	9,100	2017/7/31	9,000	2018/7/30	9,900
2016/8/2	9,100	2017/8/1	9,000	2018/7/31	9,900
2016/8/3	9,100	2017/8/2	9,000	2018/8/1	10,100
2016/8/4	9,100	2017/8/3	9,000	2018/8/2	10,100
2016/8/5	9,100	2017/8/4	9,000	2018/8/3	10,100
2016/8/8	9,100	2017/8/7	9,300	2018/8/6	10,100
2016/8/9	9,100	2017/8/8	9,300	2018/8/7	10,100
2016/8/10	9,100	2017/8/9	9,300	2018/8/8	10,300
2016/8/11	9,100	2017/8/10	9,300	2018/8/9	10,300
2016/8/12	9,100	2017/8/11	9,300	2018/8/10	10,300

2016/10/31	8,800
2016/11/1	8,800
2016/11/2	8,800
2016/11/3	8,800
2016/11/4	8,800
2016/11/7	8,800
2016/11/8	8,800
2016/11/9	8,800
2016/11/10	8,800
2016/11/11	8,800
2016/11/14	8,800
2016/11/15	8,800
2016/11/16	8,800
2016/11/17	8,800
2016/11/18	8,800
2016/11/21	8,800
2016/11/22	8,800
2016/11/23	8,800
2016/11/24	8,800
2016/11/25	8,800
2016/11/28	8,800
2016/11/29	8,800
2016/11/30	8,800
2016/12/1	8,800
2016/12/2	8,800
2016/12/5	8,800
2016/12/6	8,800
2016/12/7	8,800
2016/12/8	8,800
2016/12/9	8,800
2016/12/12	8,800
2016/12/13	8,800
2016/12/14	8,800
2016/12/15	8,800
2016/12/16	8,800
2016/12/19	8,800
2016/12/20	8,800
2016/12/21	8,800
2016/12/22	9,100
2016/12/23	9,100
2016/12/26	9,100
2016/12/27	9,100
2016/12/28	9,100
2016/12/29	9,100
2016/12/30	9,100

2017/10/23	10,000
2017/10/24	10,000
2017/10/25	10,000
2017/10/26	10,000
2017/10/27	10,000
2017/10/30	10,000
2017/10/31	10,000
2017/11/1	10,000
2017/11/2	10,000
2017/11/3	10,000
2017/11/6	10,000
2017/11/7	10,200
2017/11/8	10,200
2017/11/9	10,200
2017/11/13	10,000
2017/11/14	10,000
2017/11/15	10,000
2017/11/16	10,000
2017/11/17	10,200
2017/11/20	10,200
2017/11/21	10,200
2017/11/22	10,200
2017/11/23	10,200
2017/11/24	10,200
2017/11/27	10,400
2017/11/28	10,400
2017/11/29	10,400
2017/11/30	10,400
2017/12/1	10,600
2017/12/4	10,600
2017/12/5	10,600
2017/12/6	10,600
2017/12/7	10,600
2017/12/8	10,600
2017/12/11	10,600
2017/12/12	10,600
2017/12/13	10,600
2017/12/14	10,600
2017/12/15	10,600
2017/12/18	10,600
2017/12/19	10,600
2017/12/20	10,600
2017/12/21	10,600
2017/12/22	10,600
2017/12/25	10,600
2017/12/26	10,600
2017/12/27	10,600
2017/12/28	10,600
2017/12/29	10,600
2017/12/30	10,600

2018/10/29	10,400
2018/10/30	10,400
2018/10/31	10,400
2018/11/1	9,800
2018/11/2	9,800
2018/11/5	9,800
2018/11/6	9,800
2018/11/7	9,800
2018/11/8	9,800
2018/11/9	9,800
2018/11/12	9,800
2018/11/13	9,800
2018/11/14	9,300
2018/11/15	9,300
2018/11/16	9,300
2018/11/19	9,300
2018/11/20	9,300
2018/11/21	9,300
2018/11/22	9,300
2018/11/23	9,300
2018/11/26	9,300
2018/11/27	9,300
2018/11/28	9,300
2018/11/29	9,300
2018/11/30	9,300
2018/12/3	9,300
2018/12/4	9,300
2018/12/5	9,300
2018/12/6	9,300
2018/12/7	9,300
2018/12/10	9,300
2018/12/11	9,300
2018/12/12	9,300
2018/12/13	9,300
2018/12/14	9,300
2018/12/17	9,300
2018/12/18	9,300
2018/12/19	9,300
2018/12/20	9,300
2018/12/21	9,300
2018/12/24	9,300
2018/12/25	9,300
2018/12/26	9,300
2018/12/27	9,300
2018/12/28	9,300
2018/12/29	9,300

ICIS Dashboard Price History

Generated	10 May 2020 04:23:27	
Data	Price History	
Date Range	From 01 Jan 2016 to 31 Dec 2019	
Original Currency	CNY	CNY
Original Unit	tonne	tonne
Original Frequency	Weekly	Weekly
Selected Currency	CNY	CNY
Selected Unit	tonne	tonne
Selected Frequency	Quarterly	Quarterly

Quarterly	Propylene Oxide DEL China E Assessment Spot Week-Ahead Full Market Range Weekly (Mid) : CNY/tonne		
Q1-2016	7618.750		
Q2-2016	8296.154		
Q3-2016	10008.929		
Q4-2016	10829.167	2,016	9,188
Q1-2017	10665.385		
Q2-2017	9861.538		
Q3-2017	11288.462		
Q4-2017	11885.417	2,017	10,925
Q1-2018	12500.000		
Q2-2018	11807.692		
Q3-2018	12482.692		
Q4-2018	11686.538	2,018	12,119
Q1-2019	10447.917		
Q2-2019	9925.000		
Q3-2019	10184.615		
Q4-2019	10047.917	2,019	10,151

Exchange rates supplied by Bloomberg and XE.com (http://www.XE.com).
Prices that have been converted from the originally quoted unit or currency are shown to two decimal places.
When exporting multiple quote series, empty cells may appear in the quote table as publishing dates may not align or may vary over holiday periods.
For prices downloaded in any frequency other than the original frequency, ICIS has made some assumptions in averaging (see methodology for frequency).
To view prices as assessed by ICIS, please download series in their original published frequency.