Department of Energy
Washington, DC 20585

April 15, 2021

Austin R. Evers
American Oversight
1030 15th Street NW
Suite B255
Washington, DC 20005

Via email: foia@americanoversight.org

Re: HQ-2020-00051-F

Dear Mr. Evers:

This is a thirteenth partial response to the request for information that you sent to the Department of Energy (DOE) under the Freedom of Information Act (FOIA), 5 U.S.C. § 552. You requested:

All email communications (including email messages, calendar invitations, and attachments thereto, and including complete email chains) sent by the DOE officials specified below containing any of the following key terms:

i.Naftogaz
ii.Favorov
iii.Fruman
iv.Parnas
v.Sargeant
vi. 45 Energy Group
vii.Baumgardner
viii.SigmaBleyzer
ix.Bleyzer
x.Bensh
xi.Pelicourt
xii.Rudy
xiii.Rudolph
xiv.Giuliani
xv.Giuiliani
xvi.Guliani
xvii.Guiliani
xviii.Toensing
xix.diGenova
xx.Kislin
xxi.Hunter

AMERICAN OVERSIGHT

Printed with soy ink on recycled paper

xxii. Biden
xxiii. Parnas
xxiv. Fruman
xxv. Kolomoisky
xxvi. Klitschko
xxvii. Burisma
xxviii. Shokin
xxix. Lutsenko
xxx. Zelensky
xxxi. Zelenskyy
xxxii. Zelenskiy
xxxiii. Yermak
xxxiv. Bakanov
xxxv. Bohdan
xxxvi. Rybolovlev

Specified DOE Officials:
i. Secretary Rick Perry
ii. Deputy Secretary Dan Brouillette
iii. Former Chief of Staff Brian McCormack
iv. Anyone currently serving in the capacity of Chief of Staff
v. Under Secretary Mark Menezes
vi. Samuel Buchan, Special Adviser
vii. William Cooper, General Counsel
viii. Paul Tumminia, Senior Advisor, Office of Russian and Eurasian Affairs
ix. Anyone serving in the capacity of White House Advisor or Liaison

Please produce all responsive records from January 1, 2019, through the date the search is conducted.

On January 9, 2020, during a call including DOJ attorneys and American Oversight counsel, you agreed to waive all duplicative attachments, provided we indicate where duplicative attachments are being omitted, as well as mass mailings and newsletters. You also agreed to waive nonresponsive attachments for now, but asked that we include a slip sheet in place of each nonresponsive attachment.

Your request was assigned to DOE's Office of Executive Secretariat (ES), Office of International Affairs (IA), and Office of the General Counsel (GC) to conduct a search of their files for responsive documents. The search started on November 21, 2019, which is the cutoff date for responsive documents. You received a first partial response to this request on April 15, 2020 consisting of ten (10) documents. One of the documents was transferred in full to the Department of State (DOS) for review and direct response to you. This document was released on December 1, 2020, after DOS provided release determinations on their equities.

AMERICAN OVERSIGHT

You received a second partial on May 18, 2020, consisting of thirty-four (34) documents. Twenty (20) documents were sent to DOS for consultation. These documents were released on December 1, 2020, after DOS provided release determinations on their equities. Further, one (1) document was sent to International Trade Administration (ITA) for consultation. This document was released on August 17, 2020, after ITA provided release determinations on their equities.

You received a third partial on June 15, 2020, consisting of twelve (12) documents. Five (5) documents were sent to DOS for consultation. These documents were released on December 1, 2020, after DOS provided release determinations on their equities.

You also received a fourth partial on July 15, 2020, consisting of twenty-six (26) documents. Three (3) documents were sent to DOS for consultation. These documents were released on December 1, 2020, after DOS provided release determinations on their equities. In addition, one (1) document was sent to the Overseas Private Investment Corporation (OPIC) for consultation, and one (1) document was sent to the U.S. Trade and Development Agency (TDA) for consultation. These documents were released on November 16, 2020, after TDA and OPIC provided release determinations on their equities. Two (2) documents were sent to DOE's Pacific Northwest National Laboratory (PNNL) for review and direct response to you. These two documents were released on November 16, 2020 and December 1, 2020, after PNNL provided release determinations on their equities.

You received a fifth partial on August 17, 2020, consisting of thirty (30) documents. Thirteen (13) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities. In addition, one (1) document has been sent to U.S. Department of the Treasury (UST) for consultation and will be released once UST provides release determinations on their equities.

You received a sixth partial on September 15, 2020, consisting of forty-five (45) documents. Eleven (11) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities. In addition, one (1) of these documents has been sent to ITA for consultation and will be released once ITA provides release determinations on their equities. Lastly, one of the documents was transferred to DOE's National Nuclear Security Administration (NNSA) for review and direct response to you.

You also received a seventh partial on October 15, 2020, consisting of sixty-five (65) documents. Forty-eight (48) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities. You received an eighth partial on November 16, 2020, consisting of fifty-two (52) documents. Twenty-four (24) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities.

You also received a ninth partial on December 15, 2020, consisting of forty-four (44) documents. Ten (10) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities.

AMERICAN OVERSIGHT

You received a tenth partial on January 15, 2021, consisting of thirty-four (34) documents. Seventeen (17) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities.

You received an eleventh partial on February 16, 2021, consisting of thirteen (13) documents. Six (6) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities. In addition, two (2) documents have been sent to ITA for consultation and will be released once ITA provides release determinations on their equities.

You received a twelfth partial on March 15, 2021, consisting of nine (9) documents. Two (2) documents have been sent to DOS for consultation and will be released once DOS provides release determinations on their equities.

This letter serves as the thirteenth response for DOE. At this time, DOE has identified eleven (11) documents responsive to the request for a thirteenth partial response. The documents are being released to you as described in the accompanying index.

Upon review, DOE has determined that certain information should be withheld in the documents pursuant to Exemptions 1, 5, and 6 of the FOIA, 5 U.S.C. § 552, (b)(1), (b)(5), and (b)(6).

Each of the documents released for this thirteenth response have been reviewed by the Office of Classification, Office of Environment, Health, Safety and Security, in the DOE pursuant to 10 C.F.R. § 1004.6. These documents contain information properly classified as National Security Information, and are now being released to you with certain information withheld pursuant to Exemption 1 of the FOIA.

Exemption 1 provides that an agency may exempt from disclosure matters that are "(A) specifically authorized under criteria established by an Executive order to be kept secret in the interest of national defense or foreign policy and (B) are in fact properly classified pursuant to such Executive order . . . ." The portions deleted from the subject document(s) pursuant to Exemption 1 contain information about foreign government information; foreign relations or foreign activities of the United States, including confidential sources and are classified under section(s) 1.4 (b), (d) of Executive Order 13526 (E.O. 13526). It has been determined that release of the information could reasonably be expected to cause damage to the national security.

With respect to the information withheld from disclosure pursuant to Exemption 1, the DOE has no further discretion under the FOIA or DOE regulations to release information currently and properly classified pursuant to E.O. 13526.

Exemption 5 of the FOIA protects from mandatory disclosure “inter-agency or intra-agency memorandums or letters that would not be available by law to a party other than an agency in litigation with the agency….” 5 U.S.C. § 552(b)(5). Exemption 5 incorporates the deliberative process privilege and the attorney-client privilege. The deliberative process privilege protects recommendations, advice, and opinions that are part of the process by which agency decisions

AMERICAN OVERSIGHT

and polices are formulated. The information withheld under this privilege consists of inter-agency pre-decisional information.

Portions of these documents reflect deliberative discussions. The DOE may consider these preliminary views as part of the process that will lead to the agency's final policy decision about these matters. The withheld information does not represent a final agency position, and its release would compromise the deliberative process by which the government makes its decisions. Thus, the information is being withheld under Exemption 5 of the FOIA as pre-decisional material that is part of the agency's deliberative process.

Exemption 6 is generally referred to as the "personal privacy" exemption; it provides that the disclosure requirements of FOIA do not apply to "personnel and medical files and similar files the disclosure of which would constitute a clearly unwarranted invasion of personal privacy." 5 U.S.C. § 552(b)(6). In applying Exemption 6, the DOE considered: 1) whether a significant privacy interest would be invaded; 2) whether the release of the information would further the public interest by shedding light on the operations or activities of the Government; and 3) whether in balancing the privacy interests against the public interest, disclosure would constitute a clearly unwarranted invasion of privacy.

The information withheld under Exemption 6 consists of private cell phone numbers. This information qualifies as "similar files" because it is information in which an individual has a privacy interest. Moreover, releasing the information could subject the individuals to unwarranted or unsolicited communications. Since no public interest would be served by disclosing this information, and since there is a viable privacy interest that would be threatened by such disclosure, Exemption 6 authorizes withholding the information. Therefore, we have determined that the public interest in the information's release does not outweigh the overriding privacy interests in keeping it confidential.

This satisfies the standard set forth at 5 U.S.C. § 552(a)(8)(A) that agencies shall withhold information under FOIA "only if (I) the agency reasonably foresees that disclosure would harm an interest protected by an exemption . . . ; or (II) disclosure is prohibited by law . . . ." 5 U.S.C. § 552(a)(8)(A) also provides that whenever full disclosure of a record is not possible, agencies shall "consider whether partial disclosure of information is possible . . . ." Thus, we have determined that, in certain instances, a partial disclosure is proper.

Pursuant to 10 C.F.R. § 1004.6(d), Dr. Andrew P. Weston-Dawkes, Director, Office of Classification, Office of Environment, Health, Safety and Security, is the official responsible for the denial of the DOE classified information. Pursuant to 10 C.F.R. § 1004.7(b)(2), I am the individual responsible for the determination to withhold all other information described above. The FOIA requires that "any reasonably segregable portion of a record shall be provided to any person requesting such record after deletion of the portions which are exempt." 5 U.S.C. § 552(b). As a result, a redacted version of the documents are being released to you in accordance with 10 C.F.R. § 1004.7(b)(3).

The FOIA provides for the assessment of fees for the processing of requests. See 5 U.S.C. § 552(a)(4)(A)(i); see also 10 C.F.R. § 1004.9(a). In our October 16, 2019 letter, you were advised

AMERICAN OVERSIGHT

that your request was placed in the "other" category for fee purposes. Requesters in this category are provided with two free hours of search time and 100 free pages of duplication. In that same letter, we informed you that your fee waiver was granted. Thus, no fees will be charged for processing your request.

You also requested expedited processing of your request. Your request for expedited processing was initially denied in our letters dated October 16, 2019. Upon reconsideration of our decision to deny expedited processing of your request, your request was granted in our letter dated November 22, 2019.

If you have any questions about the processing of the request or this letter, your attorney may contact Hilarie Snyder, Trial Attorney, at Hilarie.E.Snyder@usdoj.gov or 202-305-0747.

I appreciate the opportunity to assist you with this matter.

Sincerely,

Alexander C. Morris

Digitally signed by Alexander C. Morris
Date: 2021.04.15 11:15:33 -04'00'

Alexander C. Morris
FOIA Officer
Office of Public Information

Enclosures

AMERICAN OVERSIGHT

INDEX

Request #: HQ-2020-00051-F

Thirteenth partial response for Mr. Austin R. Evers for:

All email communications (including email messages, calendar invitations, and attachments thereto, and including complete email chains) sent by the DOE officials specified below containing any of the following key terms:

i. Naftogaz
ii. Favorov
iii. Fruman
iv. Parnas
v. Sargeant
vi. 45 Energy Group
vii. Baumgardner
viii. SigmaBleyzer
ix. Bleyzer
x. Bensh
xi. Pelicourt
xii. Rudy
xiii. Rudolph
xiv. Giuliani
xv. Giuiliani
xvi. Guliani
xvii. Guiliani
xviii. Toensing
xix. diGenova
xx. Kislin
xxi. Hunter
xxii. Biden
xxiii. Parnas
xxiv. Fruman
xxv. Kolomoisky
xxvi. Klitschko
xxvii. Burisma
xxviii. Shokin
xxix. Lutsenko
xxx. Zelensky
xxxi. Zelenskyy
xxxii. Zelenskiy
xxxiii. Yermak
xxxiv. Bakanov
xxxv. Bohdan
xxxvi. Rybolovlev

AMERICAN OVERSIGHT

Specified DOE Officials:
i. Secretary Rick Perry
ii. Deputy Secretary Dan Brouillette
iii. Former Chief of Staff Brian McCormack
iv. Anyone currently serving in the capacity of Chief of Staff
v. Under Secretary Mark Menezes
vi. Samuel Buchan, Special Adviser
vii. William Cooper, General Counsel
viii. Paul Tumminia, Senior Advisor, Office of Russian and Eurasian Affairs
ix. Anyone serving in the capacity of White House Advisor or Liaison

Please produce all responsive records from January 1, 2019, through the date the search is conducted.

DOE has located eleven (11) documents responsive to your request.

- Eleven (11) documents *are being released in part pursuant to Exemptions 1, 5, and 6.*

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

~~UNCLASSIFIED w/o Attachment~~

From: Tumminia, Paul
To: Sandoli, Robert
Subject: FW: Resiliency report
Date: Monday, May 06, 2019 11:19:00 AM
Attachments: Improving Energy Resilience in the Republic of Ukraine (003).121018.IR_cv.docx
20190118 DOE Resillience Plan ECON edits_Consolidated_CJV_Response.docx

From: Spracklen, James L [mailto:James.Spracklen@pnnl.gov]
Sent: Monday, April 15, 2019 6:30 PM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Cc: White, Michael <michael.f.white@pnnl.gov>
Subject: Resiliency report

Paul: the attachments are a bit messy with the edits, but it allows you to see how we dispositioned the comments. Chris Vogt has led this effort, and Mike and I have now gone over the comments, as well. The attachments are explained by Chris. When Cornelia gets the document pretty and the formatting resolved, I'll send that to you as well.

Jim

From: Vogt, Christopher J
Sent: Wednesday, April 10, 2019 4:18 PM
To: Spracklen, James L <James.Spracklen@pnnl.gov>
Cc: White, Michael F <michael.f.white@pnnl.gov>; Brim, Cornelia P <Cornelia.Brim@pnnl.gov>
Subject: I think it's ready

Jim –

I think we have a version of the Ukraine report that addresses the comments an in-line edits that we've received from all reviewers.

The first attachment (*cv.docx) incorporates all in-line edits received, and includes my comment resolution edits. If Cornelia is willing, this is the file that she should work from. She should check all the edits in the file, and either accept them or edit them as needed. Also, it appears that some formatting (titles, for example) got messed up somewhere.

The second attachment (*CJV_Response.docx) is the file that we received from State Dept (including USAID and Kiev embassy staff) that had all of their edits and comments. I inserted their in-line edits into the first attachment. Their comments remain in the second attachment. For each comment that I resolved, I added the note "OK-CJV" to the comment, and I often added a bit of text to the comment to indicate what I did. All the comment resolutions are in the first attachment (not the second attachment). The purposes of the second attachment are (1) show you all the comments from State, and (2) show which comments that I believe are resolved (and how resolved). If you go through the comments in the second attachment, you will see a couple comments that I did NOT resolve – I didn't think that they were substantive enough to make a difference.

AMERICAN OVERSIGHT

(b) (5)

Still a lot of work for Cornelia!

Thanks,
Chris V.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Doc158

PNNL-XXXXX

OFFICIAL USE ONLY:
May be exempt from public release under the Freedom of Information Act (5 USC 552), exemption number(s) and category:

Exemption 7, Law Enforcement

Department of Energy review required before public release.

Jim Spracklen/PNNL
Reviewing Official (Name/Organization)

November 2, 2018
Date

Client Direction
Guidance Used (if Applicable)

Deleted

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION

_____ DATE 8/4/2020

~~**Derivative Declassifier review required prior to declassification**~~

U.S. DEPARTMENT OF ENERGY

Prepared for the U.S. Department of Energy under Contract DE-AC05-76RL01830

~~Classified by: Matt B. Moury, AU-1, DOE~~
~~Reason: 1.4(b)(d)~~
~~Declassifiy on: 20450622~~

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

This document was printed on recycled paper.
(9/2003)

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

x

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~
~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~
~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~
~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~
~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~
~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~
~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

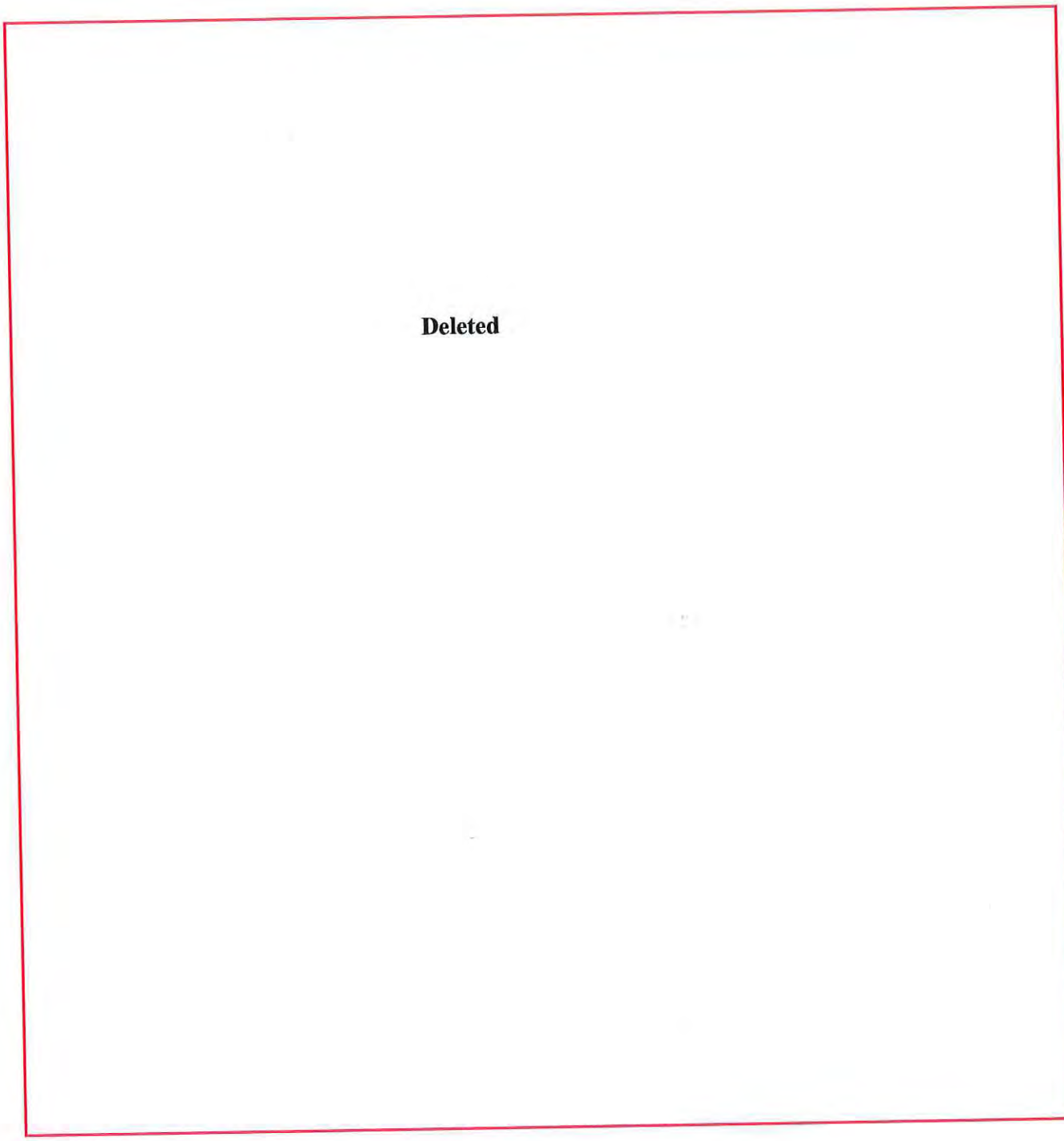
AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~



AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

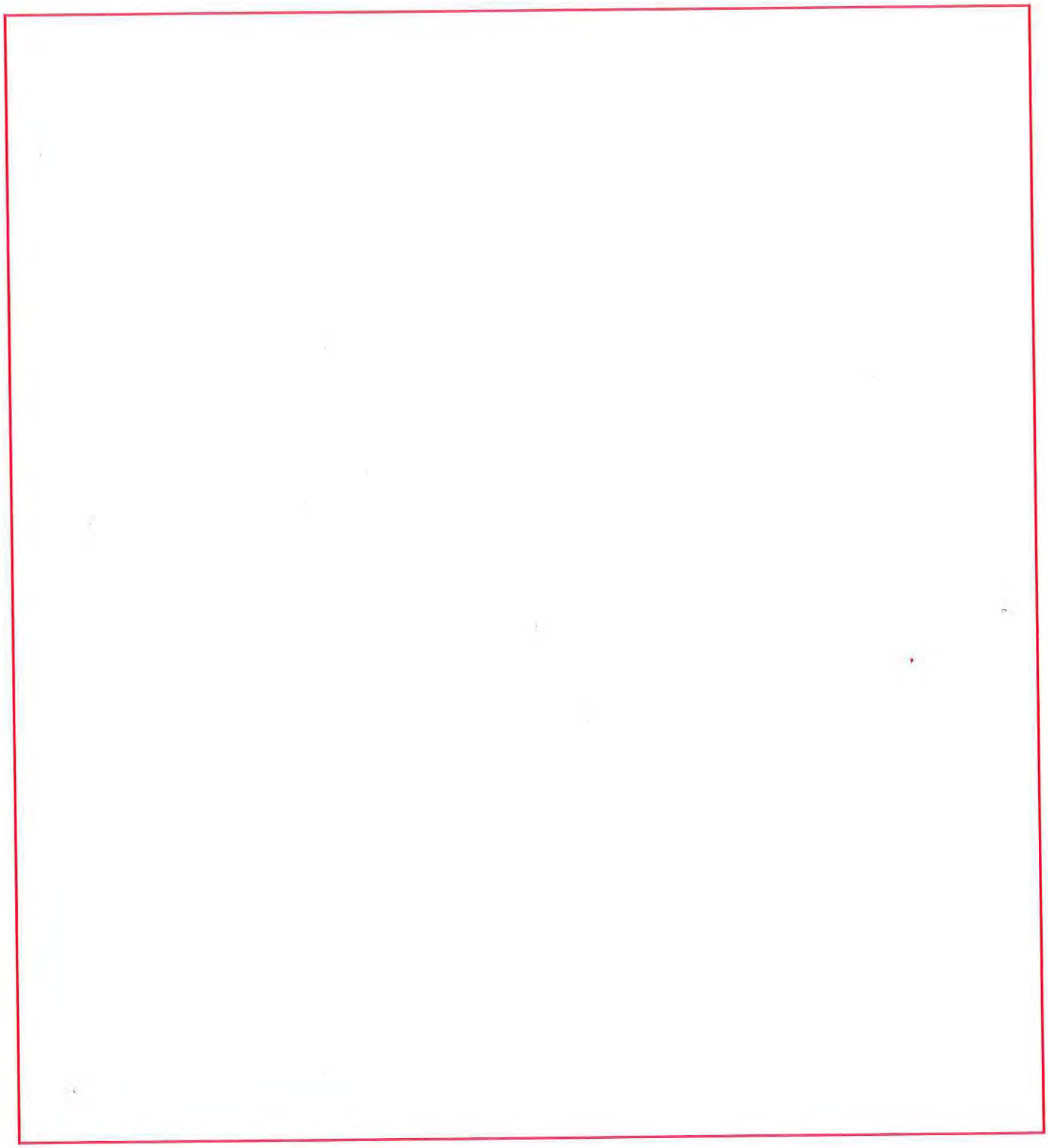
Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT



AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000139

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000168

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Deleted

AMERICAN OVERSIGHT

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 8/4/2020

~~CONFIDENTIAL~~

PNNL-28306

OFFICIAL USE ONLY:
May be exempt from public release under the Freedom of Information Act (5 USC 552), exemption number(s) and category:

Exemption 7, Law Enforcement

Department of Energy review required before public release.

Jim Spracklen/PNNL
Reviewing Official (Name/Organization)

November 2, 2018
Date

Client Direction
Guidance Used (if Applicable)

Deleted

Derivative Declassifier review required prior to declassification

Classified by: Matt B. Moury, AU-1, DOE
Reason: 1.4(b)(d)
Declassifiy on: 20450622

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

This document was printed on recycled paper.
(9/2003)

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

This page intentionally left blank.

AMERICAN OVERSIGHT

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000235

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000239

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000245

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000250

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000258

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000263

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000264

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000265

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000266

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000267

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000269

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000270

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000271

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000272

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000273

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000274

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000276

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000277

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000279

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000281

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000282

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000284

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000285

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000286

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

4.1

AMERICAN OVERSIGHT

DOE-19-1271-O-000288

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000292

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000293

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000296

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000298

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000299

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000303

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-000304

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000308

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000310

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000311

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000314

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000315

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000316

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000318

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000320

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000322

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000323

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000324

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000326

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000327

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000329

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000330

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000333

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000335

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000340

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000344

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000350

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000352

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000366

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000369

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000370

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000371

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000374

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000375

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000376

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000399

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000409

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000410

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000413

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000414

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000415

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000416

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000417

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000418

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000419

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000420

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000421

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000422

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000423

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000424

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000426

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000427

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000428

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000429

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000430

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000431

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000432

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000433

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000434

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000435

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000436

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000437

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-000438

Deleted

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

From: Tumminia, Paul
To: Lockwood, Andrea; Sandoli, Robert; Buchan, Samuel
Cc: Lyon, Jennifer
Subject: FW: Resiliency Document
Date: Monday, May 06, 2019 1:15:00 PM
Attachments: Improving Energy Resilience in the Republic of Ukraine FINAL.05032019.cp....docx

---

All:
Resiliency plan, hot off the press. I have not reviewed....

From: Vogt, Christopher J [mailto:Christopher.Vogt@pnnl.gov]
Sent: Monday, May 06, 2019 12:59 PM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Cc: Spracklen, James L <james.spracklen@pnnl.gov>; White, Michael <michael.f.white@pnnl.gov>
Subject: Resiliency Document

Paul –

The resiliency document is attached. We are awaiting one more internal reviewer, then we can insert a PNNL document number.

Thank you,
Chris Vogt

~~UNCLASSIFIED w/o attachment~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION

DATE 8/4/2020

~~CONFIDENTIAL~~

Doc 162

PNNL-XXXXX

DOE
b(1)

OFFICIAL USE ONLY:
May be exempt from public release under the Freedom of Information Act (5 USC 552), exemption number(s) and category:

Exemption 7, Law Enforcement

Department of Energy review required before public release.

Jim Spracklen/PNNL
Reviewing Official (Name/Organization)

November 2, 2018
Date

Client Direction
Guidance Used (if Applicable)

Deleted

Derivative Declassifier review required prior to declassification

Classified by: Matt B. Moury, AU-1, DOE
Reason: 1.4(b)(d)
Declassifiy on: 20450622

~~OFFICIAL USE ONLY~~

~~CONFIDENTIAL~~

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

This document was printed on recycled paper.
(9/2003)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-000518

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000538

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000540

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000541

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000546

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000572

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000577

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000591

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000595

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000596

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000600

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000624

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

From: Tumminia, Paul
To: Bell, Heather (Embassy KYIV)
Subject: FW: Resiliency Document
Date: Tuesday, May 07, 2019 9:48:00 AM
Attachments: Improving Energy Resilience in the Republic of Ukraine FINAL.05032019.cp....docx

H: resiliency plan draft.....

From: Vogt, Christopher J [mailto:Christopher.Vogt@pnnl.gov]
Sent: Monday, May 06, 2019 12:59 PM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Cc: Spracklen, James L <james.spracklen@pnnl.gov>; White, Michael <michael.f.white@pnnl.gov>
Subject: Resiliency Document

Paul –

The resiliency document is attached. We are awaiting one more internal reviewer, then we can insert a PNNL document number.

Thank you,
Chris Vogt

~~UNCLASSIFIED w/o Attachments~~

AMERICAN OVERSIGHT

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 8/4/2020

DOE
Doc 161 b(1)

OFFICIAL USE ONLY:
May be exempt from public release under the Freedom of Information Act (5 USC 552), exemption number(s) and category:

Exemption 7, Law Enforcement

Department of Energy review required before public release.

Jim Spracklen/PNNL
Reviewing Official (Name/Organization)

November 2, 2018
Date

Client Direction
Guidance Used (if Applicable)

Deleted

Derivative Declassifier review required prior to declassification

~~Classified by: Matt B. Moury, AU-1, DOE~~
~~Reason: 1.4(b)(d)~~
~~Declassifiy on: 20450622~~

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

This document was printed on recycled paper.
(9/2003)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000691

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000696

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT
DOE-19-1271-O-000700

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000704

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000722

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000738

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000764

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000769

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-000773

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000791

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000801

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000812

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000814

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

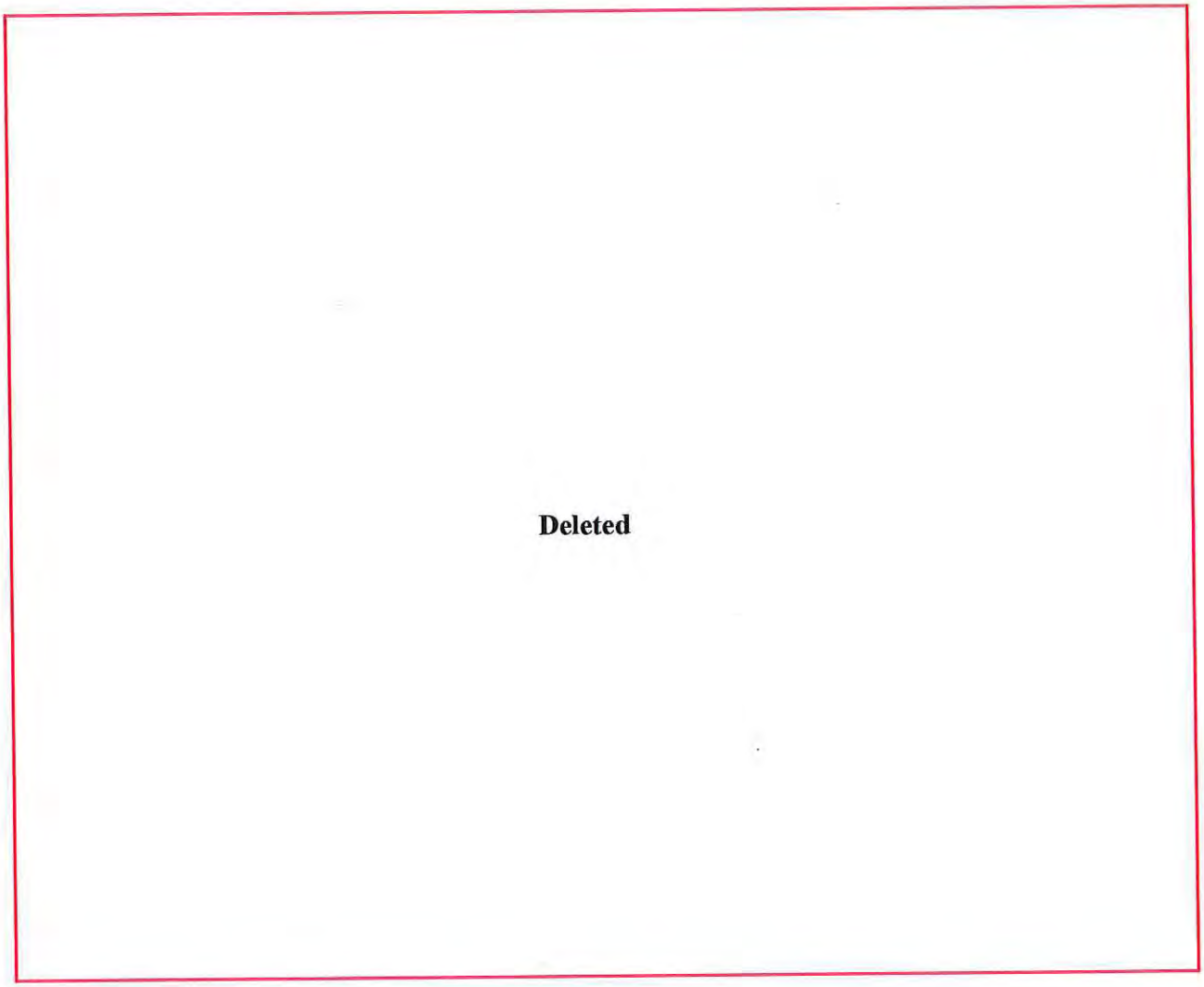
DOE-19-1271-O-000817

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)



AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000820

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000822

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000823

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-000836

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-000855

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

This page intentionally left blank.

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
~~CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION~~
~~-MODIFIED HANDLING AUTHORIZED-~~

Rodriguez, Susan (CONTR) Document 51

From: Tumminia, Paul
Sent: Friday, June 21, 2019 5:59 AM
To: Buchan, Samuel
Cc: Noel, Emily E; Sandoli, Robert; Lockwood, Andrea; McKearin, Josh
Subject: Agenda for ACE meeting with some background points
Attachments: Project Proposal Ukraine Upstream Development Pilot Program.IA.Final.docx; TripReport_TiranaAlbanai_June10-12_2019.docx

Categories: Responsive

Sam:

Here is the agenda for the meeting. Emily will print the attached documents and carry with her.

- Introduction/Opening Remarks (10 minutes)
- Implementing Partner Updates on Programming Developments, Priorities, and Upcoming Engagements throughout the Region (30 minutes)
- Three Seas Summit Readout (10 minutes)
- Ukraine Update (15 minutes)
- Baltic Energy Ministerial (10 minutes)
- Balkan Update (10 minutes)
- Conclusion (5 minutes)

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
_____ **DATE** 11/13/20

1. **Western Balkans:**

DOE b(1)

Deleted

2. **Georgia:**

3. **Baltics:**

~~Derivative Declassifier review required prior to declassification~~ ~~C/FGI-MOD~~ ~~Classified by: Matt B. Moury, AU-1, DOE Reason: 1.4(b)(d) Declassifiy on: 20451125~~

AMERICAN OVERSIGHT DOE-HQ-2021-O-000886

Deleted

DOE b(1)

4. Ukraine

Deleted

DOE b(1)

Paul Tumminia
Senior Advisor
Office of Europe and Eurasian Affairs
U.S. Department of Energy
Direct Dial: (202) 586-8036

AMERICAN OVERSIGHT

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 11/13/20

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
_____ DATE _____

Deleted

AMERICAN OVERSIGHT
DOE-2019-1271-O-000893

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
~~CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION~~
~~-MODIFIED HANDLING AUTHORIZED-~~

Rodriguez, Susan (CONTR)

From: Tumminia, Paul
Sent: Tuesday, June 25, 2019 4:53 AM
To: Sherman, Nicholas (USEU)
Subject: RE: Bootleg of Resiliency Report
Attachments: Improving Energy Resilience in the Republic of Ukraine PNNL FINAL.May 2019.docx

Categories: Responsive

Nick: This is the Lab draft. We are now in the process of cleaning this up (grammar, punctuation, taking technical terms and putting them into English). We should have this ready in a week and will take to print a booklet...

From: Sherman, Nicholas (USEU) [mailto:ShermanN@state.gov]
Sent: Tuesday, June 25, 2019 4:15 AM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Subject: [EXTERNAL] RE: Bootleg of Resiliency Report

Sorry. Yes the PNNL resiliency.

From: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Sent: Monday, June 24, 2019 5:08 PM
To: Sherman, Nicholas (USEU) <ShermanN@state.gov>
Subject: RE: Bootleg of Resiliency Report

Nick: Which do you mean? PNNL resiliency (current drafty) or something from Argonne?

From: Sherman, Nicholas (USEU) [mailto:ShermanN@state.gov]
Sent: Monday, June 24, 2019 11:07 AM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Subject: [EXTERNAL] Bootleg of Resiliency Report

Can you shoot me a copy of the DRAFT ANL report?

Thanks!

Best wishes,

Nick

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 11/23/20

AMERICAN OVERSIGHT

C/FGI-MOD
CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION
-MODIFIED HANDLING AUTHORIZED-

PNNL-XXXXX

OFFICIAL USE ONLY:
May be exempt from public release under the Freedom of Information Act (5 USC 552), exemption number(s) and category:

Exemption 7, Law Enforcement

Department of Energy review required before public release.

Jim Spracklen/PNNL
Reviewing Official (Name/Organization)

November 2, 2018
Date

Client Direction
Guidance Used (if Applicable)

Pacific Northwest
NATIONAL LABORATORY

Improving Energy Resilience in Ukraine

April 2019

RJ Steele
CJ Vogt
SR Mix
MF White
T Sarkus
J Spracklen
T Wöllert
D Bell

CONFIDENTIAL TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 11/23/20

U.S. DEPARTMENT OF ENERGY

Prepared for the U.S. Department of Energy under Contract DE-AC05-76RL01830

OFFICIAL USE ONLY

Derivative Declassifier review required prior to declassification

C/FGI-MOD

Classified by: Matt B. Moury, AU-1, DOE
Reason: 1.4(b)(d)
Declassifiy on: 20451118

AMERICAN OVERSIGHT

DOE-19-1271-O-000907

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

From: Tumminia, Paul
To: Murray, Isabel (NRCan/RNCan); Paulsen, Adam (NRCan/RNCan); Boassaly, Andrea (NRCan/RNCan)
Subject: Template for Winter action plan
Date: Wednesday, July 17, 2019 3:49:00 PM
Attachments: Ukraine Winter Action Plan 2019-2020_Short.docx

Isabel: I wanted to forward to you the template for the winter action plan which Nick sherman drafted. I am having trouble with some of the email addresses in the invitation. I think I may not have the right address. Could you please forward to your colleagues. Thanks, -P

Paul Tumminia
Senior Advisor
Office of Europe and Eurasian Affairs
U.S. Department of Energy
Direct Dial: (202) 586-8036

~~When separated from Attachment this email is UNCLASSIFIED~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Attachment 94

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
_____ DATE 2/4/2020

UKRAINE'S WINTER ENERGY SECURITY PREPAREDNESS AND RESPONSE PLAN II

2019-2020

Ukraine's "Winter Energy Security Preparedness Plan" outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing natural gas storage, and expanding the natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. This is the second iteration of Ukraine's Winter Energy Security Preparedness and Response Plan.

~~Derivative Declassifier review required prior to declassification~~

~~Classified by: Matt B. Moury, AU-1, DOE~~
~~Reason: 1.4(b)(d)~~
~~Declassifiy on: 20450622~~

AMERICAN OVERSIGHT

~~CONFIDENTIAL~~

Page intentionally left blank.

AMERICAN OVERSIGHT

EXECUTIVE SUMMARY

1. Overview

Ukraine's "Winter Energy Security Preparedness and Response Plan" (The Plan) outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximize natural gas storage and expand natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. The Plan defines the following areas:

- Key preparedness measures to help mitigate threat emergency situations in the energy sector; and
- Key response actions to disruptions to power supply systems, district heating and heat generation facilities, and supply of energy resources.

DOE b(1)

Deleted



2. Stakeholder Engagement

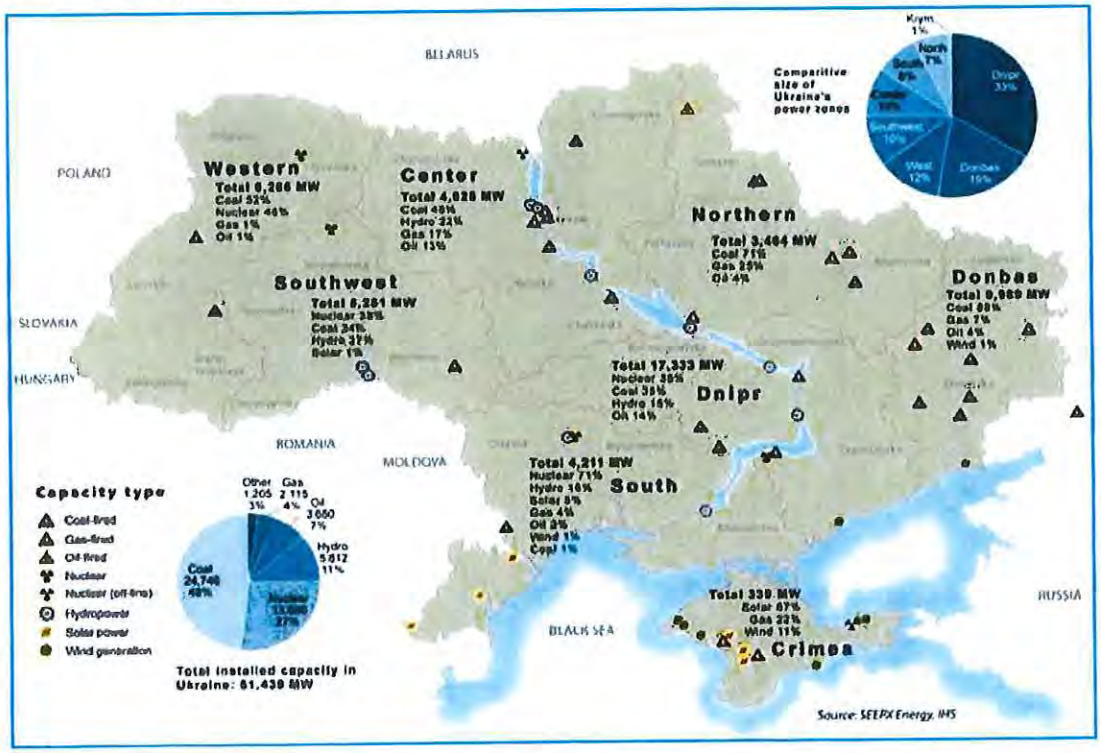
Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication in the event of a crisis. The Plan provides guidance, *inter alia*, for the following national authorities:

- Ministry of Energy and Coal Industry
- Ministry of Regional Development, Building and Housing

AMERICAN OVERSIGHT

- Ministry of Internal Affairs
- Ministry of Infrastructure
- Ministry of Defense
- Ministry of Health
- Ministry of Social Policy
- National Electricity Regulatory Commission
- State Nuclear Regulatory Inspectorate
- State Emergency Service
- Naftogaz
- Ukrenergo
- Energoatom
- State Energy Efficiency and Conservation Agencies
- State Highway Agency
- State Special Communication and Data Protection Service
- Local self-government authorities

3. Electricity Generation



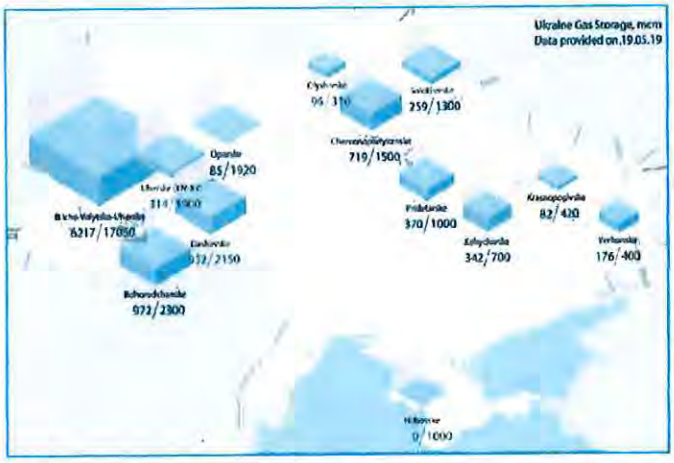
Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of

AMERICAN OVERSIGHT

0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.

The Plan's electric generation recommendations section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial electricity users have a sufficient supply for the 2019-2020 heating season. This includes increasing coal influx, reducing electric power consumption, increasing imports and reducing exports of electricity, and opening congested transmission pathways by completing interconnection lines (e.g. high voltage lines (HVL) to shift energy from Rivne to the Kyiv substation). Preparedness measures for emergencies in heat and power engineering sector include:

Natural Gas



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz should maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

4. Coal

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase coal production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

A-type coal *(assuming a baseline supply of 300 kTons/month)*:

Deleted	**DOE b(1)**

AMERICAN OVERSIGHT

DOE-19-1271-O-001134

DOE b(1)

Deleted

5. District Heating

District heating provides a measure to provide space heating and water heating to the majority of Ukrainian residences. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes. A crisis triggers additional actions:



DOE b(1)

Deleted

6. Crisis Response

Stakeholders at the national, regional and local levels should prepare for emergency response scenarios in the event of a crisis. Scenarios where a major system accident becomes possible include when the Unified Energy Systems of Russia and Belarus are operated separately, or when there's a major shortage of generation capacity and the Unified Energy System (UES) of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus. On exceeding the maximum allowed power exchange, stability of the UES of Ukraine may be breached at connections with Russia and Belarus, and UES of Ukraine may be automatically separated by

AMERICAN OVERSIGHT

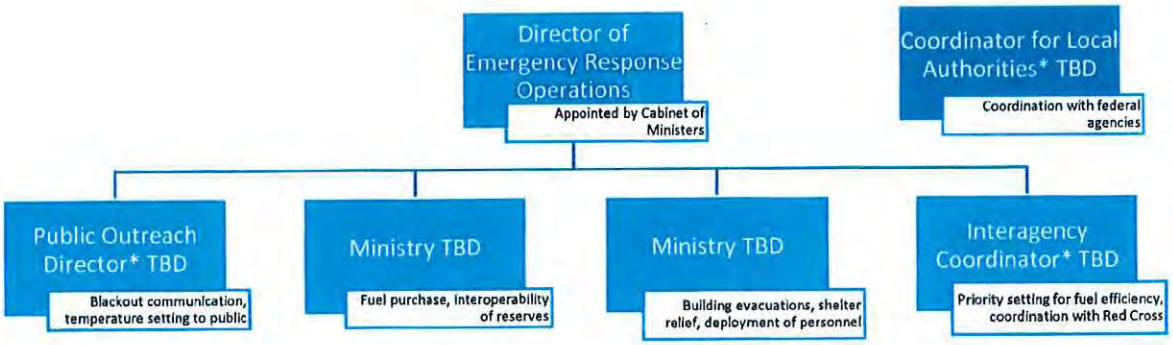
DOE-19-1271-O-001135

actuating devices counteracting asynchronous operation under generation capacity shortage.

DOE b(1)

Deleted

Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



AMERICAN OVERSIGHT

PREPAREDNESS

AMERICAN OVERSIGHT

DOE-19-1271-O-001137

Page intentionally left blank.

AMERICAN OVERSIGHT

STAKEHOLDERS

1. Overview

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication and help energy sector decision in the event of a crisis. Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



2. Ministry of Energy and Coal Industry

The Ministry of Energy and Coal Industry of Ukraine is the primary central government agency responsible for electricity sectors policies; the civil-nuclear complex, oil and gas sector; and coal industry. The ministry operates under the authority of the Cabinet of Ministers.

3. Ministry of Regional Development, Building and Housing

The Ministry for Regional Development, Building and Housing of Ukraine is responsible for housing infrastructure development and the formation and implementation of state policy in order to create a comfortable, high quality and safe living space for human development. The ministry advances energy planning and implementation efforts by increasing the competitiveness of regions (energy investment and reform) and promoting energy efficiency in the housing and utilities sector.

4. Ministry of Internal Affairs

The Ministry of Internal Affairs executes state policy for the protection of rights and liberties of citizens, investigates unlawful acts against the interest of society and state, fights crime, provides civil order, ensures civil security, and regulates traffic safety. The Ministry also protects energy infrastructure.

AMERICAN OVERSIGHT

DOE-19-1271-O-001139

5. Ministry of Infrastructure

The Ministry of Infrastructure formulates and implements state policy in the fields of air, road, rail, sea, river and urban electric transport, as well as on issues related to the use of subway systems, roads, transportation safety, merchant shipping and navigational/hydrographic support for vessels. The Ministry has programs for improving energy efficiency in the transportation and communications sectors.

6. Ministry of Defense

The Ministry of Defense is responsible for preventing hostility, structuring the military, and repelling all types of aggression (both in country and internationally). The Ministry has been integrating energy efficiency into its military programs across the country. Under the new Cyber Security Strategy, the Ministry will be responsible for implementing cybersecurity protection, as cyberattacks against energy infrastructure is common.

7. Ministry of Health

The Ministry of Health is the main healthcare body of the central government, responsible for managing the universal healthcare system and implementing state policy in the fields of medicine and healthcare. The Ministry has an interest in reducing illness linked to pollution and nuclear safety.

8. Ministry of Social Policy

The Ministry of Social Policy is responsible for regulating labor relations, family and children, immigration and trafficking, women's rights, children's rights, and humanitarian aid. The Ministry is also involved in an inter-agency working group for assessing and managing regulatory reforms for energy performance contracts and supporting activities.

9. National Electricity Regulatory Commission (NERC)

The NERC is involved in the formation and enforcement of a unified state policy towards electricity markets, natural gas, petroleum and petroleum products in the areas of heating, centralized water supply and drainage, treatment and disposal of household waste. The NERC is responsible for the licensing of economic activities in the fields of electricity, heating, centralized water supply and drainage in the oil and gas sector. The NERC sets the prices (tariffs) for electricity, for the supply of natural gas and gas (methane) of coal deposits, and other tariffs.

10. State Nuclear Regulatory Inspectorate (SNRI)

SNRI is the central government executive authority responsible for formation and implementation of state policy in the field of nuclear and radiation safety. The SNRI sets criteria, requirements and conditions of safety in nuclear energy use (normative documents, standards), issues permits and licenses to carry out activities in this area (licensing), and exercises the state supervision for observance of legislation, norms, rules and standards of nuclear and radiation safety (supervision).

AMERICAN OVERSIGHT

11. State Emergency Service (SES)

The SES implements state policies in the domain of civil protection, protection of population and territories from emergencies, prevention of emergencies, rectification of emergency consequences, rescue work, fire extinguishing, fire and technogenic safety, accident rescue service activities and hydrometeorologic activities. The former Ministry was created from the consequences of the Chernobyl catastrophe. The SES is a central body of executive power with activities directed and coordinated by the Cabinet of Ministers through the Ministry of Internal Affairs.

12. Naftogaz

Naftogaz is the national oil and gas company of Ukraine; it is a state-owned company. The company is involved with extraction, transportation, and refinement of natural gas and crude oil. Naftogaz operates under the Ministry of Energy and Coal Mining.

13. Ukrenergo

UKRENERGO is a national power company responsible for operational and technological control of the Integrated Power System (IPS) of Ukraine and electricity transmission via trunk power grids from generating plants to the distribution networks of the regional electricity suppliers (*oblenergos*). UKRENERGO is a state enterprise that covers the entire territory of Ukraine.

14. Energoatom

The National Nuclear Energy Generating Company of Ukraine (Energoatom) is a state enterprise operating all four active nuclear power stations in Ukraine. Energoatom operates under the Ministry of Fuel and Energy.

15. State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE)

The SAEE is a central executive authority governed and coordinated by the Cabinet of Ministers of Ukraine and is responsible for developing and implementing energy efficiency and renewable energy government policy.

16. State Highway Agency

Transport of fuel fossils (i.e. oil and gas) is under the Ministry on Energy and Fuel, while most of security responsibility matters are supervised by Ministry of Interior or other state agencies. The Ministry of Infrastructure only implements government policies related to the transport and communication sectors as well as security related to transport.

17. State Service of Special Communications and Information Protection

The State Service of Special Communications and Information Protection of Ukraine is responsible for protecting state information within data networks, safeguarding the critical

AMERICAN OVERSIGHT

information infrastructure, technical security, and intelligence services for the Administration.

18. Local self-government authorities

There are 24 regions in Ukraine and each one is divided into districts. The President of Ukraine and his Cabinet of Ministers appoint the heads of local governments. The city councils are tasked with disaster relief efforts and safety programs that protect population groups from natural disasters.

AMERICAN OVERSIGHT

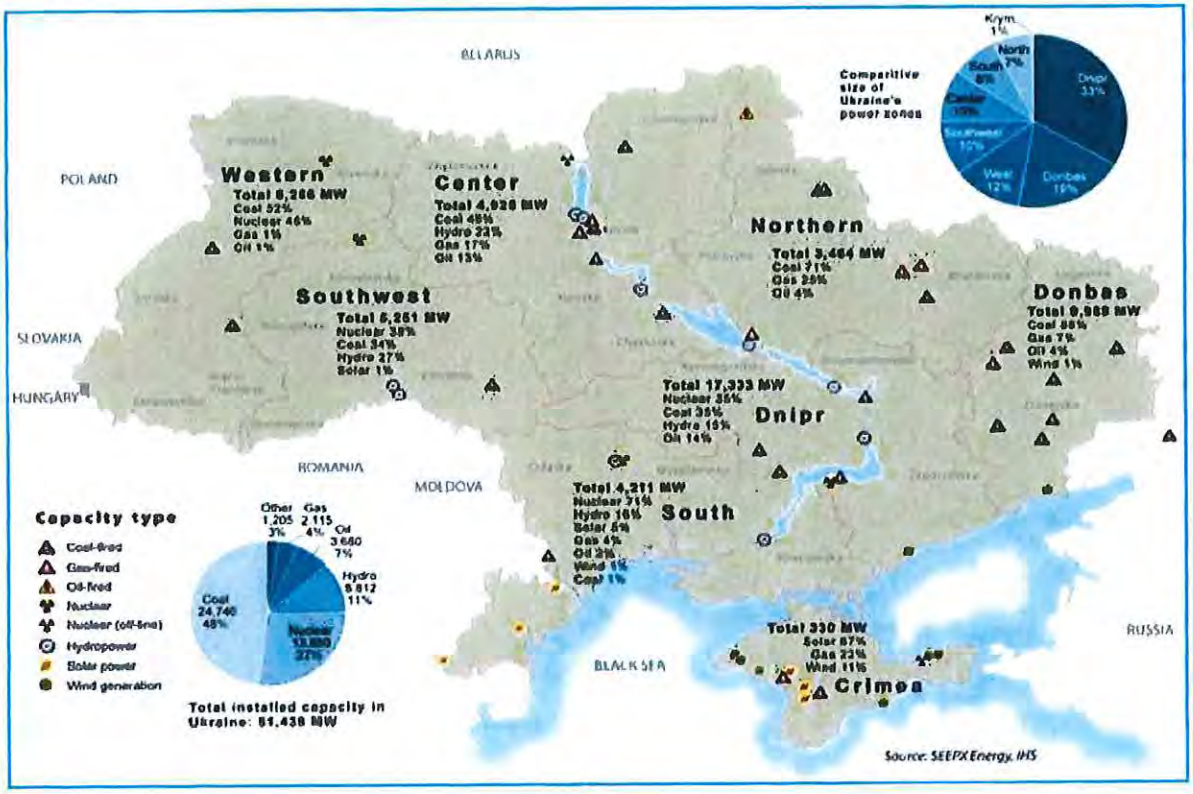
DOE-19-1271-O-001142

AMERICAN OVERSIGHT

POWER SECTOR

1. Overview

Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of 0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.



2. Threats to the Power Sector

The following constitute the primary threats to steady-state operation of Ukraine's electricity sector:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE
b(1)

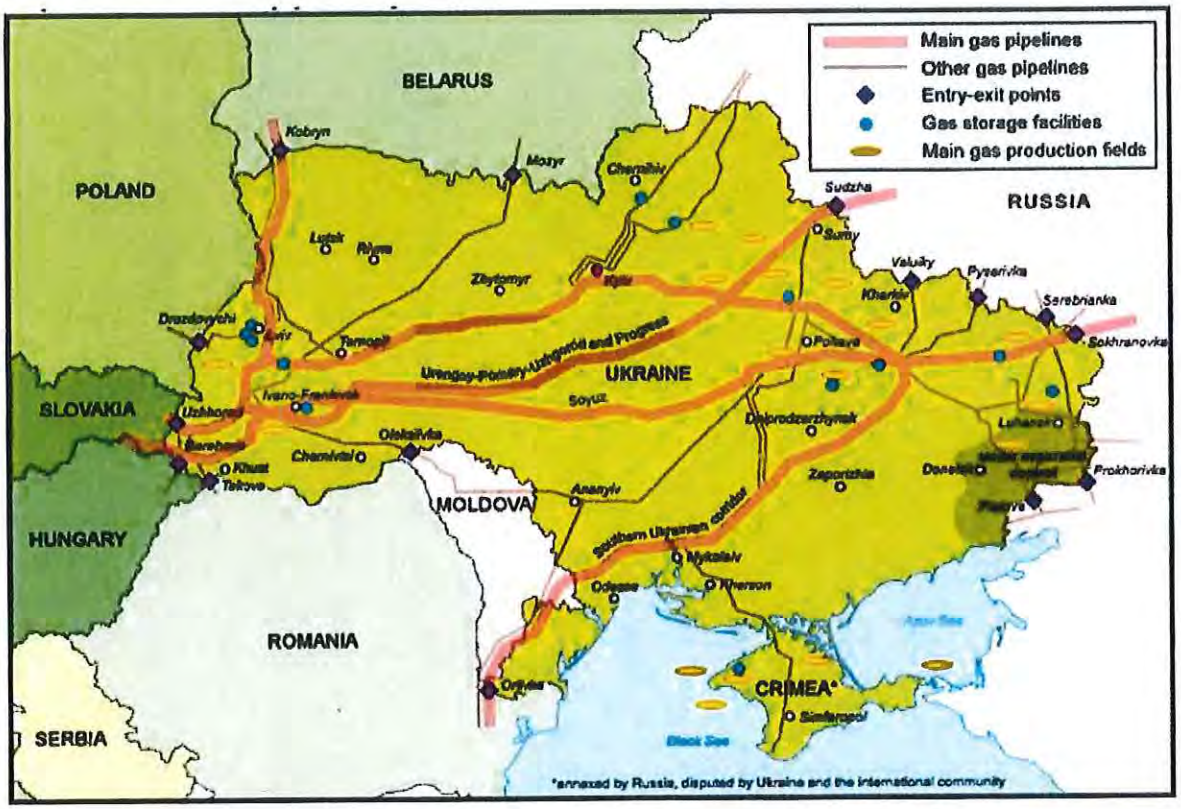
Deleted

AMERICAN OVERSIGHT

NATURAL GAS

1. Overview

This section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial oil and natural gas users have sufficient supply for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing domestic natural gas production, and expanding the natural gas reverse flow capacity from the European Union (EU).



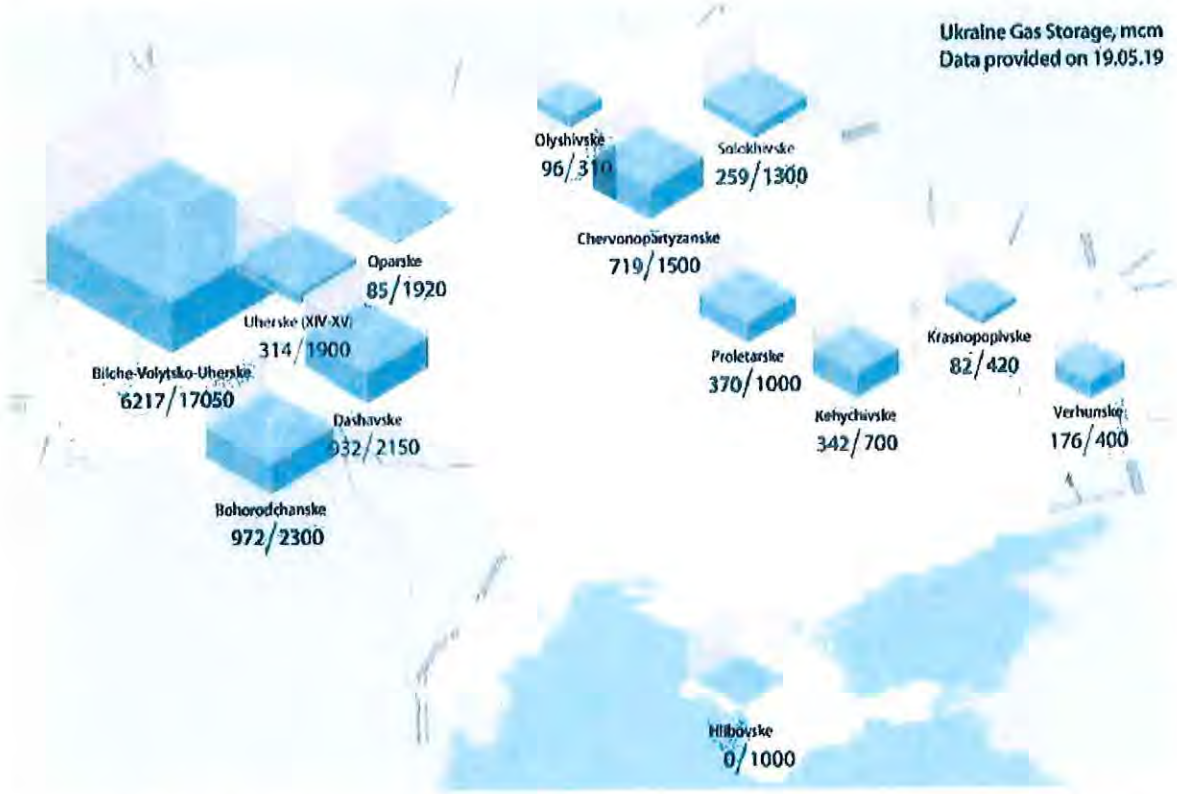
2. Zero-Transit Scenario

Ukraine is actively preparing for the possibility of a cut-off of Russian natural gas transit to Europe and Turkey via the Ukrainian Gas Transit System (GTS) this winter. Since 2014, Gazprom has used Ukraine's GTS to ship between 60-90 billion cubic meters of gas per year (bcma) to Europe and Turkey (equivalent to 12-18 percent of European Union gas demand). Western European energy markets may be able to withstand a prolonged cutoff with purchases of liquefied natural gas (LNG). This is not the case for a number of relatively unintegrated countries in Central and Southeastern Europe (notably Bulgaria and Moldova) dependent on Russia as a dominant—and many times sole—supplier. The most vulnerable country could be Ukraine itself. If Ukraine has not preemptively imported and stored adequate volumes of gas and Gazprom cuts off gas shipments to Europe via Ukraine, the country could face a serious energy crises. Key points include:

AMERICAN OVERSIGHT

- A prolonged disruption of Russian natural gas supplies will put stress on European gas markets and potentially limit Ukraine's ability to contract for West-East supplies.
- Adding additional reverse flow capacity from existing pipeline infrastructure with neighboring countries is technically feasible by reconfiguring compression stations.
- Creative options such as virtual reverse flows and contracting with other countries to book capacity within Ukraine's large gas storage system present more ways to build resilience.
- A coordinated push to find financing opportunities from international financial institutions or the Eurobond market to allow Naftogaz or independent traders to purchase gas supplies to build storage will be key.

3. Storage



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz wants to maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage

AMERICAN OVERSIGHT

DOE-19-1271-O-001147

facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

As Ukraine is currently using only about a third of its reverse flow capacity from the EU, the biggest obstacle in increasing natural gas storage injection levels to at least 60 MMcm/d is financial, not technical. Inadequate finances are also an obstacle to the option of Ukraine restoring gas supplies from Russia's Gazprom. Naftogaz needs to secure adequate credit in order to increase natural gas purchases and is encouraged to pursue all avenues to do so.

The Government of Ukraine should consider direct financing from the state budget to cover the shortfall in natural gas storage. Furthermore, Naftogaz needs to call for the reinstatement of natural gas curtailment measures. Curtailing domestic natural gas consumption will free up additional volumes of domestic production to be injected into underground storage.

4. Opening Greater Reverse Flow Capacity

Ukraine currently consumes approximately 30 bcm of natural gas per year. Domestic production meets two-thirds of this demand. A reverse flow-pipeline from Slovakia that returns the Russian gas to Ukraine once it crosses into the European Union supplies the remaining 10 bcm. Ukraine, the most energy intensive economy in Europe, uses most of the gas for household consumption and communal heating systems, as well as heavy industry. State-owned natural gas company Naftogaz is currently planning for a zero-transit scenario following the expiration of their long-term transit contract with Russia's Gazprom on December 31, 2019. This includes the need to not only expand routes from neighboring countries but also build sufficient storage supplies to maintain enough compression within the system for West-East flows. Ukraine's options include:

- **Slovakia:** Slovakia's system is the most capable of delivering additional supplies to Ukraine. Ukraine transit supplies enter the EU at the Veľké Kapušany compressor station in Eastern Slovakia. The station's total power of nearly 300 MW—the largest compressor station in Europe—allows technical entry flow of approximately 70 bcm per year. Most of these supplies transit onward to the Central European Gas Hub in Baumgarten. Of these transit supplies, an average of 8 bcm per year reverse flow back into Ukraine through the Bundice border point via the Vojany-Uzhorod pipeline. Absent East-West transit supplies, Slovakia's capacity would technically be free for sizeable flows of European gas to Ukraine. However, many EU Member States may themselves struggle to meet gas demand in the event of a prolonged cut-off. Moreover, Eustream believes that reversing the four lines at Veľké Kapušany would violate the agreement under which Gazprom has booked most of the capacity of the lines entering from Ukraine until 2028.

- **Poland:** Poland's current capacity to deliver reverse flow natural gas supplies to Ukraine stands at 1.5 bcma via the Drozdowice interconnector on the Poland-Ukraine border; the first reversed flows began in April 2014 in the wake of the Ukraine-Russia conflict under a 2012 deal with German utility RWE. The gas transits through Poland's Gaz-System with deliveries based on European wholesale price levels. Increasing the reverse flow capacity to the interconnector's 5 bcm capacity would probably require adding additional reverse compression. Technically, this would likely entail moving a mobile compression turbine from another station. Other discussions such as the Hermanowice interconnector, expanding

AMERICAN OVERSIGHT

the Świnoujście LNG terminal and Baltic Pipe present future, medium-term opportunities to expand north-south flows.

- **Hungary:** Three interconnector pipelines cross the Ukraine-Hungary border with one built with a reverse flow mode. The two others are sufficient to provide Hungary's full imports from Russia for domestic consumption, storage, and transit. This provides the potential to reverse flow 7.1 bcm to Ukraine. In the event of a supply shutoff from Russia to Ukraine, Hungary would utilize stored gas and try to find new supplies elsewhere, some via LNG. This will have impacts on Hungary's gas system configuration—as well as available supply—to enter into Ukraine.

- **Romania:** The Trans-Balkan pipeline through Ukraine transports about 20 bcm of natural gas through Romania to Bulgaria, Greece, Macedonia, and Turkey. When and if those shipments are halted, Ukrtransgaz hopes to equip Transit 1 pipeline—one of the three connections that form the Trans-Balkan pipeline—with physical reverse-flow capabilities. The facility could allow up to 5 bcm in additional supplies to be shipped to Ukraine. Romania's current upstream natural gas production could make this an attractive medium-term option if Black Sea gas development goes forward..

- **Virtual reverse flow:** European customers sometimes trade gas through an accounting mechanism known as "virtual reverse flow" whereby less physical gas is delivered downstream and the upstream recipient pays the downstream customer. Virtual reserve flow would permit Naftogaz to decrease physical gas shipments to Slovakia or Poland to divert the gas into Ukrainian gas storage or sell into the mid-stream market. This would not require physical reverse flow capability from the transmission network.

AMERICAN OVERSIGHT

AMERICAN OVERSIGHT

Scenario No. 1: With gas supplies from Gazprom for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3187.8	102.8	4726.1	157.5	5796.9	187.0	13710.8	149.0	5833.5	188.2	4842.0	172.9	3805.0	122.7	14480.5	160.9	28191.3	154.9
Import	892.2	28.8	946.3	31.5	1517.0	48.9	3355.5	36.5	1991.8	64.3	2125.5	75.9	1653.7	53.3	5771.0	64.1	9126.5	50.1
including Gazprom PJSC	0.0	0.0	0.0	0.0	518.2	16.7	518.2	5.6	924.6	29.8	927.9	33.1	304.4	9.8	2156.9	24.0	2675.1	14.7
from Europe	892.2	28.8	946.3	31.5	998.8	32.2	2837.3	30.8	1067.3	34.4	1197.6	42.8	1349.3	43.5	3614.2	40.2	6451.5	35.4
Domestic production	1679.9	54.2	1650.3	55.0	1726.4	55.7	5056.6	55.0	1692.4	54.6	1532.3	54.7	1689.3	54.5	4914.0	54.6	9970.6	54.8
Offtake from	615.7	19.9	2129.5	71.0	2553.5	82.4	5298.7	57.6	2149.3	69.3	1184.2	42.3	462.0	14.9	3795.5	42.2	9094.2	50.0
UGSF* Injection into UGSF	112.9	3.6	0.0	0.0	0.0	0.0	112.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.9	0.6
Ukraine, total	3080.0	99.4	4717.8	157.3	5794.4	186.9	13592.2	147.7	5779.1	186.4	4773.8	170.5	3821.5	123.3	14374.4	159.7	27966.6	153.7
including Consumers	2904.2	93.7	4539.8	151.3	5570.3	179.7	13014.3	141.5	5537.3	178.6	4556.8	162.7	3661.2	118.1	13755.3	152.8	26769.6	147.1
including Ministry of	513.6	16.6	560.6	18.7	655.2	21.1	1729.4	18.8	678.0	21.9	591.2	21.1	609.1	19.6	1878.3	20.9	3607.7	19.8
Industry - metallurgy	254.2	8.2	278.6	9.3	319.9	10.3	852.7	9.3	321.6	10.4	269.5	9.6	261.2	8.4	852.3	9.5	1705.0	9.4
- chemistry	259.4	8.4	282.0	9.4	335.3	10.8	876.7	9.5	356.5	11.5	321.7	11.5	348.0	11.2	1026.2	11.4	1902.9	10.5
including RSA funds	1601.8	51.7	3024.3	100.8	3922.2	126.5	8548.3	92.9	3965.2	127.9	3339.1	119.3	2691.5	86.8	9995.8	111.1	18544.1	101.9
- population	1131.6	36.5	1806.0	60.2	2299.5	74.2	5237.1	56.9	2385.3	76.9	1975.5	70.6	1526.4	49.2	5887.2	65.4	11124.3	61.1
- heat energy	389.6	12.6	1088.5	36.3	1426.3	46.0	2904.4	31.6	1437.8	46.4	1222.5	43.7	949.2	30.6	3609.5	40.1	6513.9	35.8
OTE	175.8	5.7	178.0	5.9	224.1	7.2	577.9	6.3	241.8	7.8	217.0	7.8	160.3	5.2	619.1	6.9	1197.0	6.6

DOE-19-1271-O-001150

AMERICAN OVERSIGHT

Scenario No 2: Without gas supply from Gazprom
Calculated Ukrainian balance for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3229,9	104,2	4717,8	157,3	5794,4	186,9	13742,1	149,4	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	28116,5	154,5
including																		
Import, including	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
"Gazprom" PJSC	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
from Europe	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
Domestic production	1679,9	54,2	1650,3	55,0	1726,4	55,7	5056,6	55,0	1692,4	54,6	1532,3	54,7	1689,3	54,5	4914,0	54,6	9970,6	54,8
Offtake from UGSF	500,0	16,1	1276,0	42,5	3186,0	102,8	4962,0	53,9	3933,0	126,9	2973,0	106,2	2132,2	68,8	9038,2	100,4	14000,2	76,9
Injection into UGSF	149,9	4,8	0,0	0,0	0,0	0,0	149,9	1,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	149,9	0,8
Ukraine, total	3080,0	99,4	4717,8	157,3	5794,4	186,9	13592,2	147,7	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	27966,6	153,7
including																		
Consumers	2904,2	93,7	4559,8	151,3	5570,3	179,7	13014,3	141,5	5537,3	178,6	4556,8	162,7	3661,2	118,1	13755,3	152,8	26769,6	147,1
including RSA funds	1601,8	51,7	3024,3	100,8	3922,2	126,5	8548,3	92,9	3965,2	127,9	3339,1	119,3	2691,5	86,8	9995,8	111,1	18544,1	101,9
OTE	175,8	5,7	178,0	5,9	224,1	7,2	577,9	6,3	241,8	7,8	217,0	7,8	160,3	5,2	619,1	6,9	1197,0	6,6

* In "consumers" category the volumes of gas consumption in ATO zone has not been included. It amounts to around 450 mln. c.m. per month (15-20 mln.c.m. per day) ** Consumption is calculation based on the assumption of mildly cold winter.
*** Values for gas offtake from UGSF were accepted on the maximum process level, including remains during offtake period. It amounts to 19 bln. c.m., including 4.8 bln.c.m. for process stock reserve

DOE-19-1271-O-001151

Coal

1. Overview

While nuclear power plants are used for baseload power in Ukraine, coal-fired power plants operate in intermediate and peaking modes. Therefore, coal-fired units are most essential during the high power-consumption periods of winter and summer. Having adequate fuel supplies on hand during these seasons (especially winter) is of crucial importance in terms of maintaining reliable electricity supply. The following section presents recommendations that address these factors.

2. Coal Market

Coal from non-government controlled Donbas, which previously provided all anthracite and a significant part of gas coal (G-coal), is no longer available. Ukraine is converting some plants to burn G-coal rather than anthracite, significantly reducing Ukraine's reliance on anthracite. More than 80 percent of coal is produced by private company DTEK, which operates the most productive mines. The remaining state-owned mines have been united in the new National Coal Company. The main buyers of thermal coal are the private company DTEK and state-owned Centrenergo. Because of the method NKREKP uses to regulate electricity tariffs, coal prices in Ukraine are the highest in Europe. Ukraine is highly dependent on coal resources and it needs a more transparent system for maintaining and pricing supplies.

3. Reliance on Anthracite

Russian anthracite appears to be the Achilles heel of Ukraine's coal supply. Although some coal-fired power plant units have already converted from burning anthracite to burning bituminous coal and more are planned, a number of power plant units still burn anthracite. Ukraine is forced to import roughly one fourth of the coal it consumes, approximately 80 percent of which is anthracite imported from Russia. If that supply is disrupted during severe winter cold or summer heat or when one of Ukraine's nuclear power plants goes offline, then Ukraine's electric supply could be negatively affected. The world markets for coal are dominated by bituminous and subbituminous coals, so the reliance on Russian anthracite necessarily constrains Ukraine's alternative fuel supply options.

4. Ensuring Sufficient Supplies

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

Deleted

DOE b(1)

5. **Railway and port infrastructure for Coal transloading and transportation to National Thermal Power Plants**

Planning Factor	Capacity
Thermal Power Plants (TPP) and Coal Consumption	
Freight rail cars (of all types)	
Transportation of coal by rail	
Transportation of coal by sea through the Odessa region sea ports (includes Illichivsk, Pivdenny, TIC)	
Transportation of coal through all ports	

Deleted

DOE b(1)

AMERICAN OVERSIGHT

1. Overview

District heating plays an important role in Ukraine serving almost 60 percent of the population with over 25 million customers (Eurostat). Municipalities and communal users account for over 40 percent of heat energy usage. Natural gas serves as the dominant fuel. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes.

2. Threats to Combined Heat and Power (CHP) System

For household heating the main threats to ensuring the established operating conditions for heat sources (boiler houses and CHP), which supply thermal energy to public institutions and to communities in Ukraine, and the reliable and safe operation of the heating energy sector production, transmission and delivery entities (heating and hot water supply) are:

DOE b(1)

- Fuel shortfall (decrease of operational fuel stockpiles at boiler houses and CHP below levels Deleted);
- Insufficient gas delivery volumes or gas pressure decrease in the main and distribution gas networks to the heating sector enterprises;
- Complete cessation or emergency cut-off of the gas supply to the heating sector enterprises;
- Cessation of power supply and water supply to the heating energy sector enterprises as a consequence of an emergency in the electric energy sector.

3. Response Measures to Remove Threats to Communal Heating Enterprises

The heat equipment of communal heating enterprises, according to the applicable Ukrainian legislation, falls into high-risk facilities category, and, consequently, has emergency response plans for all facilities (broken down by the categories of a boiler house, heating network area and central heat distribution station) approved according to a procedure established by legislation. There is an emergency stock of necessary materials and spare parts.

Emergency response exercises help personnel understand procedures and respond in a prompt manner during crisis events. In every specific situation, preparedness allows for a calculation analysis to identify the stability of heating networks and of building heating systems. This calculation then triggers a sequence of actions to prevent negative effects of a potential blackout.

4. Preparedness Measures for Emergencies in the Heat and Power Engineering Sector

AMERICAN OVERSIGHT

DOE-19-1271-O-001154

The following measures should be taken in order to prevent possible threats to the heat and power energy sector:

- Ensure fulfillment of proposals regarding purchase of fuel (coal and mazut) and establish policies to implement a more transparent and cost reflective tariff setting process.
- A check of actual conditions and operability using backup fuel (in the case of natural gas as primary fuel and heavy oil as reserve fuel), etc.
- Ensure heavy oil purchase in the volumes required for a sustainable fall-winter period.
- Ensure the availability of backup sources of power and water supply.
- The implementation of energy conservation measures for all types of properties for the fall-winter period.
- Consideration of the possibility of shifting vacation periods at all education institutions and prolongation of vacations. Development of a mechanism for implementation of new terms and duration, if necessary.
- Development of prioritization lists of consumers' groups in the event of the possible shutoff of the heating system.
- The development of messaging by the Ministry of Regional Development and Construction to limit consumption of heating and distribution using billboards and posters; TV commercials, radio, press and text messages for mobile phones; electronic payment systems, heating utility bills; and letters by the Ministry of Regional Development and Construction to industrial enterprises indicating the reasons for limitations in heating consumption and recommending measures to be taken;
- Extension of the term of hot water supply shutoff for the population and public institutions.

5. Fuel switching to Mazut

DOE b(1)

The estimated consumption of natural gas at TPPs and CHPs during fall-winter 2019-20 amounts **Deleted**. Taking into account the technical and process capacity on TPPs of generating companies and CHPs (current mazut equipment stock is in satisfactory technical condition or in out of use state and can start its operation after routine maintenance, proper condition of access roads or mazut pipelines) the following are suggested:

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

Transportation of heavy oil by rail	Deleted	DOE b(1)

6. Planning

A prolonged cut-off in natural gas supplies during the winter heating season carries the potential to trigger a crisis for household heating, particularly in the event of below-average temperatures. Preparedness entails establishing a system of public outreach to ensure reduction in consumption by both households and industry. The following actions should be taken for district heating systems in the event of a cut-off in natural gas supplies:



Deleted

DOE b(1)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

RESPONSE

AMERICAN OVERSIGHT

Page intentionally left blank.

AMERICAN OVERSIGHT

EMERGENCY RESPONSE

1. Overview

DOE b(1)

This section details Ukraine's emergency response procedure in the event of a major system accident. A major system accident is an accident leading to power loss at a greater part of Ukraine's territory and loss of own needs generation at combined heat power and nuclear power plants followed **Deleted** A major system accident may be preceded with:

- Gradual increase in generation capacity shortage;
- Sudden loss of major generation capacity;
- Emergency shut-down of several system-forming transmission lines of the main grid.

Scenarios where a major system accident become possible include conditions where the Unified Energy Systems of Russia and Belarus are operated separately, or when there is a major shortage of generation capacity and the Unified Energy System of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus.

2. Major Tasks for All-level Operating and Dispatch Personnel

Major tasks for all-level operating and dispatch personnel in the event of a major system accident include:

DOE b(1)

1. **Deleted**

AMERICAN OVERSIGHT

DOE-19-1271-O-001160

DOE b(1)

Deleted

3. Prevention of accident evolving into a special system wide collapse

Personnel should undertake the following procedures in the case of separate operation of the UES of Ukraine from the Unified Energy Systems of Russia and Belarus consistent with

DOE b(1)

Deleted

3. Recovery after a special (extreme) system wide collapse and restoration of a greater part of the Unified Energy System of Ukraine «from 0».

AMERICAN OVERSIGHT

DOE-19-1271-O-001161

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

DOE
b(1)

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION
-MODIFIED HANDLING AUTHORIZED-

From: Tumminia, Paul
To: Robeck, Mark; Noel, Emily E
Subject: RE: Can you send me the template?
Date: Thursday, July 25, 2019 10:10:00 AM
Attachments: Ukraine Winter Action Plan 2019-2020_Short.docx

From: Robeck, Mark
Sent: Thursday, July 25, 2019 10:10 AM
To: Noel, Emily E <emily.noel@hq.doe.gov>
Cc: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Subject: Can you send me the template?

Mark R. Robeck
Deputy General Counsel
for Energy Policy
U.S. Department of Energy
202-586-6732 (direct)
(b) (6) (cell)
mark.robeck@hq.doe.gov

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
_____ **DATE** 11/23/20

~~Attachment is C/FGI-MOD.
When separated from attachment this email is UNCLASSIFIED.~~

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
~~CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION~~
~~-MODIFIED HANDLING AUTHORIZED-~~

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION

_____ DATE _____

UKRAINE'S WINTER ENERGY SECURITY PREPAREDNESS AND RESPONSE PLAN II

2019-2020

Ukraine's "Winter Energy Security Preparedness Plan" outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing natural gas storage, and expanding the natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. This is the second iteration of Ukraine's Winter Energy Security Preparedness and Response Plan.

~~Derivative Declassifier review required prior to declassification~~

~~Classified by: Matt B. Moury, AU-1, DOE~~
~~Reason: 1.4(b)(d)~~
~~Declassifiy on: 20451115~~

~~C/FGI MOD~~

AMERICAN OVERSIGHT

Page intentionally left blank.

AMERICAN OVERSIGHT

EXECUTIVE SUMMARY

1. Overview

Ukraine's "Winter Energy Security Preparedness and Response Plan" (The Plan) outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximize natural gas storage and expand natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. The Plan defines the following areas:

- Key preparedness measures to help mitigate threat emergency situations in the energy sector; and
- Key response actions to disruptions to power supply systems, district heating and heat generation facilities, and supply of energy resources.

DOE b(1)



2. Stakeholder Engagement

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication in the event of a crisis. The Plan provides guidance, *inter alia*, for the following national authorities:

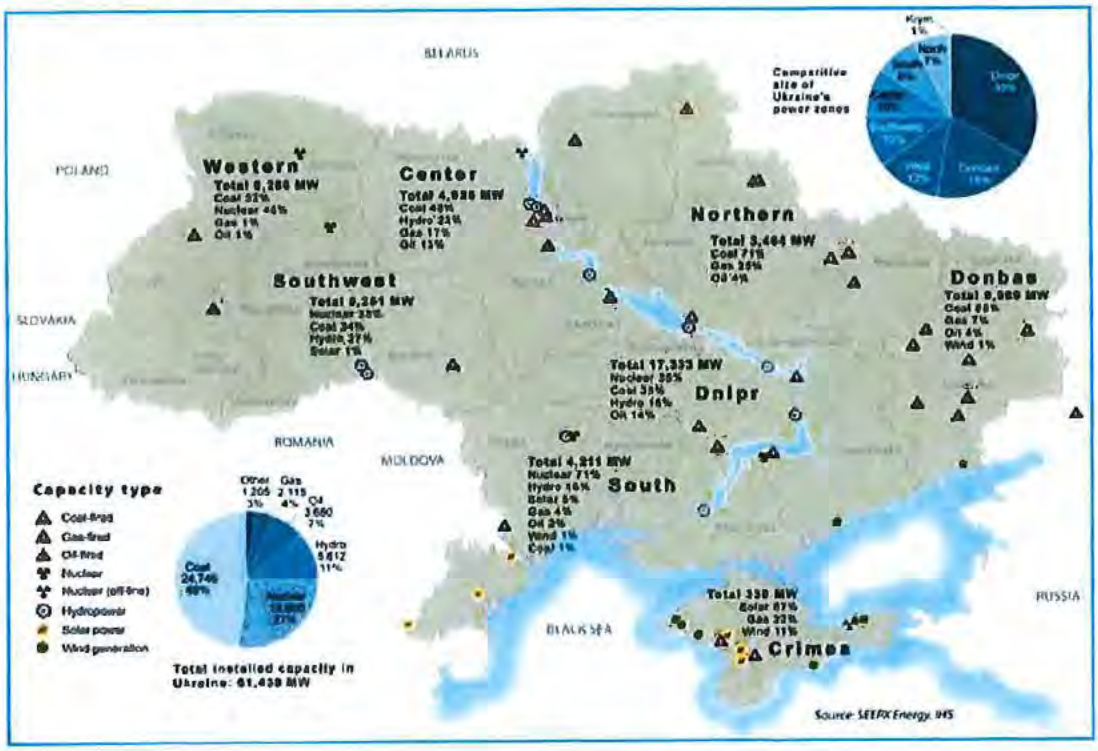
- Ministry of Energy and Coal Industry
- Ministry of Regional Development, Building and Housing

AMERICAN OVERSIGHT

DOE-19-1271-O-001187

- Ministry of Internal Affairs
- Ministry of Infrastructure
- Ministry of Defense
- Ministry of Health
- Ministry of Social Policy
- National Electricity Regulatory Commission
- State Nuclear Regulatory Inspectorate
- State Emergency Service
- Naftogaz
- Ukrenergo
- Energoatom
- State Energy Efficiency and Conservation Agencies
- State Highway Agency
- State Special Communication and Data Protection Service
- Local self-government authorities

3. Electricity Generation



Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of

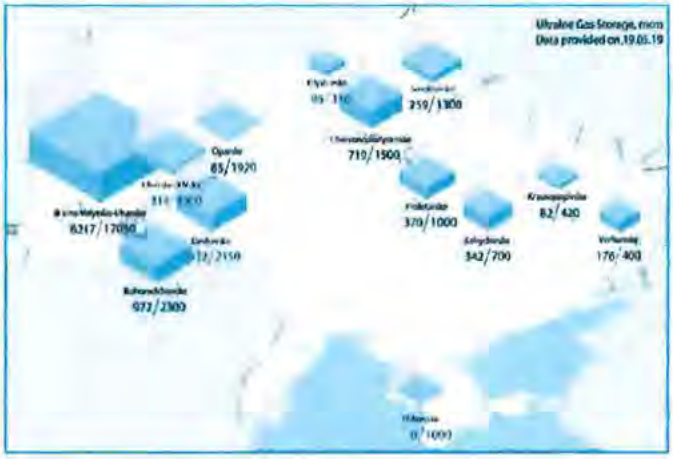
AMERICAN OVERSIGHT

DOE-19-1271-O-001188

0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.

The Plan's electric generation recommendations section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial electricity users have a sufficient supply for the 2019-2020 heating season. This includes increasing coal influx, reducing electric power consumption, increasing imports and reducing exports of electricity, and opening congested transmission pathways by completing interconnection lines (e.g. high voltage lines (HVL) to shift energy from Rivne to the Kyiv substation). Preparedness measures for emergencies in heat and power engineering sector include:

Natural Gas



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz should maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

4. Coal

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase coal production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

A-type coal *(assuming a baseline supply of 300 kTons/month)*:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE b(1)

Deleted

5. District Heating

District heating provides a measure to provide space heating and water heating to the majority of Ukrainian residences. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes. A crisis triggers additional actions:



DOE b(1)

Deleted

6. Crisis Response

Stakeholders at the national, regional and local levels should prepare for emergency response scenarios in the event of a crisis. Scenarios where a major system accident becomes possible include when the Unified Energy Systems of Russia and Belarus are operated separately, or when there's a major shortage of generation capacity and the Unified Energy System (UES) of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus. On exceeding the maximum allowed power exchange, stability of the UES of Ukraine may be breached at connections with Russia and Belarus, and UES of Ukraine may be automatically separated by

AMERICAN OVERSIGHT

DOE-19-1271-O-001190

actuating devices counteracting asynchronous operation under generation capacity shortage.

DOE b(1)

Deleted

Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



AMERICAN OVERSIGHT

PREPAREDNESS

AMERICAN OVERSIGHT

DOE-19-1271-O-001192

Page intentionally left blank.

AMERICAN OVERSIGHT

STAKEHOLDERS

1. Overview

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication and help energy sector decision in the event of a crisis. Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



2. Ministry of Energy and Coal Industry

The Ministry of Energy and Coal Industry of Ukraine is the primary central government agency responsible for electricity sectors policies; the civil-nuclear complex, oil and gas sector; and coal industry. The ministry operates under the authority of the Cabinet of Ministers.

3. Ministry of Regional Development, Building and Housing

The Ministry for Regional Development, Building and Housing of Ukraine is responsible for housing infrastructure development and the formation and implementation of state policy in order to create a comfortable, high quality and safe living space for human development. The ministry advances energy planning and implementation efforts by increasing the competitiveness of regions (energy investment and reform) and promoting energy efficiency in the housing and utilities sector.

4. Ministry of Internal Affairs

The Ministry of Internal Affairs executes state policy for the protection of rights and liberties of citizens, investigates unlawful acts against the interest of society and state, fights crime, provides civil order, ensures civil security, and regulates traffic safety. The Ministry also protects energy infrastructure.

AMERICAN OVERSIGHT

5. Ministry of Infrastructure

The Ministry of Infrastructure formulates and implements state policy in the fields of air, road, rail, sea, river and urban electric transport, as well as on issues related to the use of subway systems, roads, transportation safety, merchant shipping and navigational/hydrographic support for vessels. The Ministry has programs for improving energy efficiency in the transportation and communications sectors.

6. Ministry of Defense

The Ministry of Defense is responsible for preventing hostility, structuring the military, and repelling all types of aggression (both in country and internationally). The Ministry has been integrating energy efficiency into its military programs across the country. Under the new Cyber Security Strategy, the Ministry will be responsible for implementing cybersecurity protection, as cyberattacks against energy infrastructure is common.

7. Ministry of Health

The Ministry of Health is the main healthcare body of the central government, responsible for managing the universal healthcare system and implementing state policy in the fields of medicine and healthcare. The Ministry has an interest in reducing illness linked to pollution and nuclear safety.

8. Ministry of Social Policy

The Ministry of Social Policy is responsible for regulating labor relations, family and children, immigration and trafficking, women's rights, children's rights, and humanitarian aid. The Ministry is also involved in an inter-agency working group for assessing and managing regulatory reforms for energy performance contracts and supporting activities.

9. National Electricity Regulatory Commission (NERC)

The NERC is involved in the formation and enforcement of a unified state policy towards electricity markets, natural gas, petroleum and petroleum products in the areas of heating, centralized water supply and drainage, treatment and disposal of household waste. The NERC is responsible for the licensing of economic activities in the fields of electricity, heating, centralized water supply and drainage in the oil and gas sector. The NERC sets the prices (tariffs) for electricity, for the supply of natural gas and gas (methane) of coal deposits, and other tariffs.

10. State Nuclear Regulatory Inspectorate (SNRI)

SNRI is the central government executive authority responsible for formation and implementation of state policy in the field of nuclear and radiation safety. The SNRI sets criteria, requirements and conditions of safety in nuclear energy use (normative documents, standards), issues permits and licenses to carry out activities in this area (licensing), and exercises the state supervision for observance of legislation, norms, rules and standards of nuclear and radiation safety (supervision).

AMERICAN OVERSIGHT

DOE-19-1271-O-001195

11. State Emergency Service (SES)

The SES implements state policies in the domain of civil protection, protection of population and territories from emergencies, prevention of emergencies, rectification of emergency consequences, rescue work, fire extinguishing, fire and technogenic safety, accident rescue service activities and hydrometeorologic activities. The former Ministry was created from the consequences of the Chernobyl catastrophe. The SES is a central body of executive power with activities directed and coordinated by the Cabinet of Ministers through the Ministry of Internal Affairs.

12. Naftogaz

Naftogaz is the national oil and gas company of Ukraine; it is a state-owned company. The company is involved with extraction, transportation, and refinement of natural gas and crude oil. Naftogaz operates under the Ministry of Energy and Coal Mining.

13. Ukrenergo

UKRENERGO is a national power company responsible for operational and technological control of the Integrated Power System (IPS) of Ukraine and electricity transmission via trunk power grids from generating plants to the distribution networks of the regional electricity suppliers (*oblenergos*). UKRENERGO is a state enterprise that covers the entire territory of Ukraine.

14. Energoatom

The National Nuclear Energy Generating Company of Ukraine (Energoatom) is a state enterprise operating all four active nuclear power stations in Ukraine. Energoatom operates under the Ministry of Fuel and Energy.

15. State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE)

The SAEE is a central executive authority governed and coordinated by the Cabinet of Ministers of Ukraine and is responsible for developing and implementing energy efficiency and renewable energy government policy.

16. State Highway Agency

Transport of fuel fossils (i.e. oil and gas) is under the Ministry on Energy and Fuel, while most of security responsibility matters are supervised by Ministry of Interior or other state agencies. The Ministry of Infrastructure only implements government policies related to the transport and communication sectors as well as security related to transport.

17. State Service of Special Communications and Information Protection

The State Service of Special Communications and Information Protection of Ukraine is responsible for protecting state information within data networks, safeguarding the critical

AMERICAN OVERSIGHT

information infrastructure, technical security, and intelligence services for the Administration.

18. Local self-government authorities

There are 24 regions in Ukraine and each one is divided into districts. The President of Ukraine and his Cabinet of Ministers appoint the heads of local governments. The city councils are tasked with disaster relief efforts and safety programs that protect population groups from natural disasters.

AMERICAN OVERSIGHT

DOE-19-1271-O-001197

AMERICAN OVERSIGHT

POWER SECTOR

1. Overview

Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of 0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.



2. Threats to the Power Sector

The following constitute the primary threats to steady-state operation of Ukraine's electricity sector:

Deleted	**DOE b(1)**

AMERICAN OVERSIGHT

DOE
b(1)

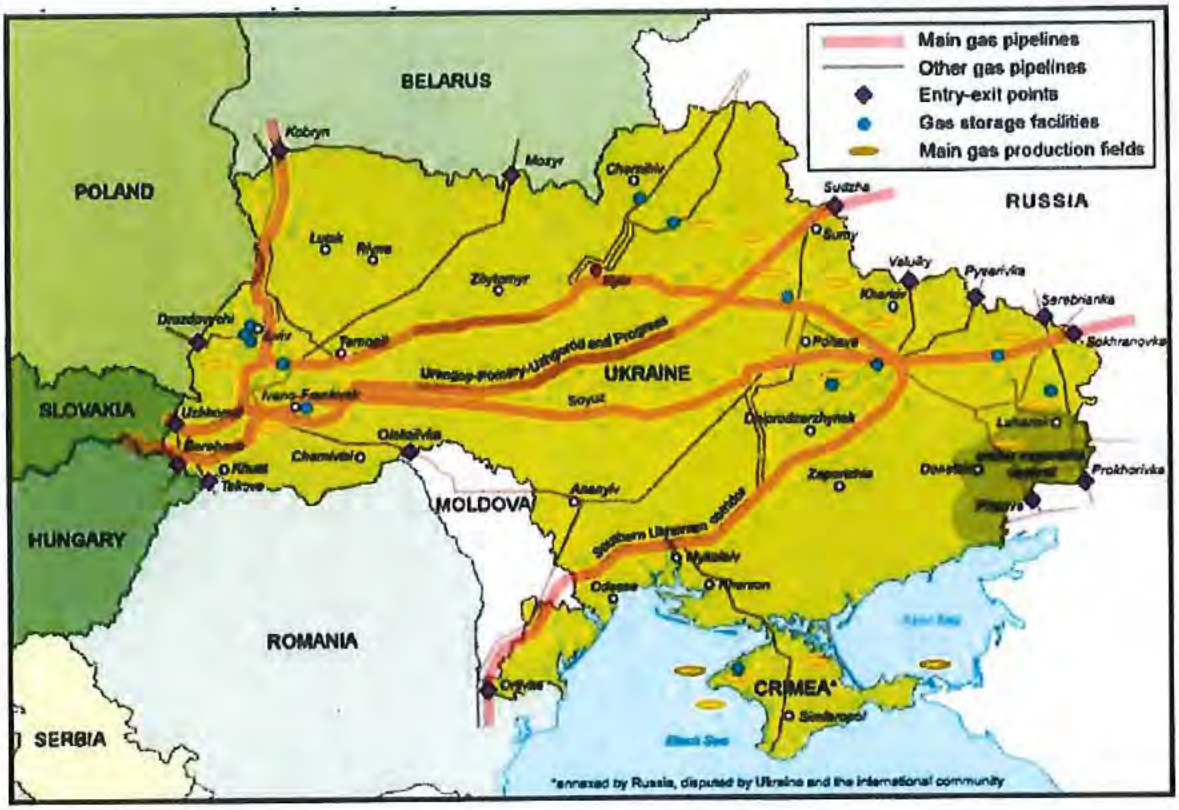
Deleted

AMERICAN OVERSIGHT

NATURAL GAS

1. Overview

This section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial oil and natural gas users have sufficient supply for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing domestic natural gas production, and expanding the natural gas reverse flow capacity from the European Union (EU).



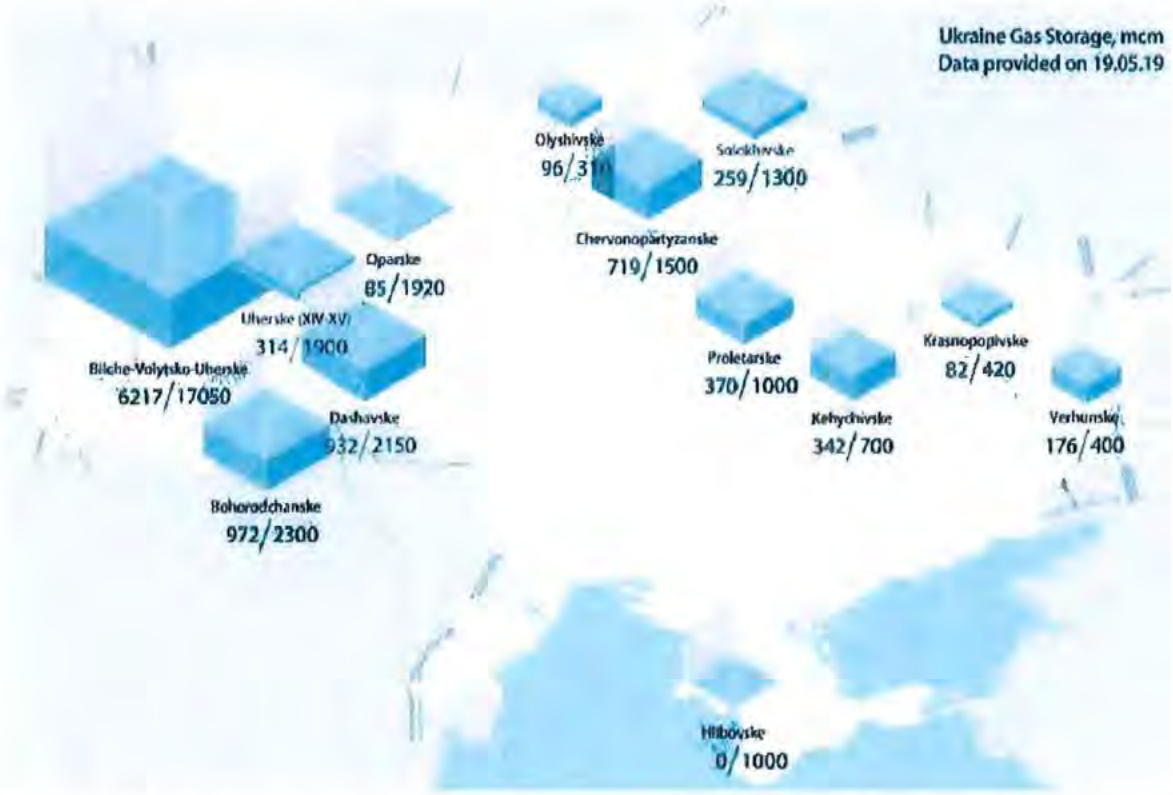
2. Zero-Transit Scenario

Ukraine is actively preparing for the possibility of a cut-off of Russian natural gas transit to Europe and Turkey via the Ukrainian Gas Transit System (GTS) this winter. Since 2014, Gazprom has used Ukraine's GTS to ship between 60-90 billion cubic meters of gas per year (bcma) to Europe and Turkey (equivalent to 12-18 percent of European Union gas demand). Western European energy markets may be able to withstand a prolonged cutoff with purchases of liquefied natural gas (LNG). This is not the case for a number of relatively unintegrated countries in Central and Southeastern Europe (notably Bulgaria and Moldova) dependent on Russia as a dominant—and many times sole—supplier. The most vulnerable country could be Ukraine itself. If Ukraine has not preemptively imported and stored adequate volumes of gas and Gazprom cuts off gas shipments to Europe via Ukraine, the country could face a serious energy crises. Key points include:

AMERICAN OVERSIGHT

- A prolonged disruption of Russian natural gas supplies will put stress on European gas markets and potentially limit Ukraine's ability to contract for West-East supplies.
- Adding additional reverse flow capacity from existing pipeline infrastructure with neighboring countries is technically feasible by reconfiguring compression stations.
- Creative options such as virtual reverse flows and contracting with other countries to book capacity within Ukraine's large gas storage system present more ways to build resilience.
- A coordinated push to find financing opportunities from international financial institutions or the Eurobond market to allow Naftogaz or independent traders to purchase gas supplies to build storage will be key.

3. Storage



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz wants to maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage

AMERICAN OVERSIGHT

facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

As Ukraine is currently using only about a third of its reverse flow capacity from the EU, the biggest obstacle in increasing natural gas storage injection levels to at least 60 MMcm/d is financial, not technical. Inadequate finances are also an obstacle to the option of Ukraine restoring gas supplies from Russia's Gazprom. Naftogaz needs to secure adequate credit in order to increase natural gas purchases and is encouraged to pursue all avenues to do so.

The Government of Ukraine should consider direct financing from the state budget to cover the shortfall in natural gas storage. Furthermore, Naftogaz needs to call for the reinstatement of natural gas curtailment measures. Curtailing domestic natural gas consumption will free up additional volumes of domestic production to be injected into underground storage.

4. Opening Greater Reverse Flow Capacity

Ukraine currently consumes approximately 30 bcm of natural gas per year. Domestic production meets two-thirds of this demand. A reverse flow-pipeline from Slovakia that returns the Russian gas to Ukraine once it crosses into the European Union supplies the remaining 10 bcm. Ukraine, the most energy intensive economy in Europe, uses most of the gas for household consumption and communal heating systems, as well as heavy industry. State-owned natural gas company Naftogaz is currently planning for a zero-transit scenario following the expiration of their long-term transit contract with Russia's Gazprom on December 31, 2019. This includes the need to not only expand routes from neighboring countries but also build sufficient storage supplies to maintain enough compression within the system for West-East flows. Ukraine's options include:

- **Slovakia:** Slovakia's system is the most capable of delivering additional supplies to Ukraine. Ukraine transit supplies enter the EU at the Veľké Kapušany compressor station in Eastern Slovakia. The station's total power of nearly 300 MW—the largest compressor station in Europe—allows technical entry flow of approximately 70 bcm per year. Most of these supplies transit onward to the Central European Gas Hub in Baumgarten. Of these transit supplies, an average of 8 bcm per year reverse flow back into Ukraine through the Bundice border point via the Vojany-Uzhorod pipeline. Absent East-West transit supplies, Slovakia's capacity would technically be free for sizeable flows of European gas to Ukraine. However, many EU Member States may themselves struggle to meet gas demand in the event of a prolonged cut-off. Moreover, Eustream believes that reversing the four lines at Veľké Kapušany would violate the agreement under which Gazprom has booked most of the capacity of the lines entering from Ukraine until 2028.

- **Poland:** Poland's current capacity to deliver reverse flow natural gas supplies to Ukraine stands at 1.5 bcma via the Drozdowice interconnector on the Poland-Ukraine border; the first reversed flows began in April 2014 in the wake of the Ukraine-Russia conflict under a 2012 deal with German utility RWE. The gas transits through Poland's Gaz-System with deliveries based on European wholesale price levels. Increasing the reverse flow capacity to the interconnector's 5 bcm capacity would probably require adding additional reverse compression. Technically, this would likely entail moving a mobile compression turbine from another station. Other discussions such as the Hermanowice interconnector, expanding

AMERICAN OVERSIGHT

the Świnoujście LNG terminal and Baltic Pipe present future, medium-term opportunities to expand north-south flows.

- **Hungary:** Three interconnector pipelines cross the Ukraine-Hungary border with one built with a reverse flow mode. The two others are sufficient to provide Hungary's full imports from Russia for domestic consumption, storage, and transit. This provides the potential to reverse flow 7.1 bcm to Ukraine. In the event of a supply shutoff from Russia to Ukraine, Hungary would utilize stored gas and try to find new supplies elsewhere, some via LNG. This will have impacts on Hungary's gas system configuration—as well as available supply—to enter into Ukraine.

- **Romania:** The Trans-Balkan pipeline through Ukraine transports about 20 bcm of natural gas through Romania to Bulgaria, Greece, Macedonia, and Turkey. When and if those shipments are halted, Ukrtransgaz hopes to equip Transit 1 pipeline—one of the three connections that form the Trans-Balkan pipeline—with physical reverse-flow capabilities. The facility could allow up to 5 bcm in additional supplies to be shipped to Ukraine. Romania's current upstream natural gas production could make this an attractive medium-term option if Black Sea gas development goes forward..

- **Virtual reverse flow:** European customers sometimes trade gas through an accounting mechanism known as "virtual reverse flow" whereby less physical gas is delivered downstream and the upstream recipient pays the downstream customer. Virtual reserve flow would permit Naftogaz to decrease physical gas shipments to Slovakia or Poland to divert the gas into Ukrainian gas storage or sell into the mid-stream market. This would not require physical reverse flow capability from the transmission network.

AMERICAN OVERSIGHT

DOE-19-1271-O-001204

Scenario No. 1: With gas supplies from Gazprom for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3187.8	102.8	4726.1	157.5	5796.9	187.0	13710.8	149.0	5833.5	188.2	4842.0	172.9	3805.0	122.7	14480.5	160.9	28191.3	154.9
Import	892.2	28.8	946.3	31.5	1517.0	48.9	3355.5	36.5	1991.8	64.3	2125.5	75.9	1653.7	53.3	5771.0	64.1	9126.5	50.1
including Gazprom PJSC	0.0	0.0	0.0	0.0	518.2	16.7	518.2	5.6	924.6	29.8	927.9	33.1	304.4	9.8	2156.9	24.0	2675.1	14.7
from Europe	892.2	28.8	946.3	31.5	998.8	32.2	2837.3	30.8	1067.3	34.4	1197.6	42.8	1349.3	43.5	3614.2	40.2	6451.5	35.4
Domestic production	1679.9	54.2	1650.3	55.0	1726.4	55.7	5056.6	55.0	1692.4	54.6	1532.3	54.7	1689.3	54.5	4914.0	54.6	9970.6	54.8
Offtake from	615.7	19.9	2129.5	71.0	2553.5	82.4	5298.7	57.6	2149.3	69.3	1184.2	42.3	462.0	14.9	3795.5	42.2	9094.2	50.0
UGSF* Injection into UGSF	112.9	3.6	0.0	0.0	0.0	0.0	112.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.9	0.6
Ukraine, total	3080.0	99.4	4717.8	157.3	5794.4	186.9	13592.2	147.7	5779.1	186.4	4773.8	170.5	3821.5	123.3	14374.4	159.7	27966.6	153.7
including																		
Consumers	2904.2	93.7	4539.8	151.3	5570.3	179.7	13014.3	141.5	5537.3	178.6	4556.8	162.7	3661.2	118.1	13755.3	152.8	26769.6	147.1
including Ministry of	513.6	16.6	560.6	18.7	655.2	21.1	1729.4	18.8	678.0	21.9	591.2	21.1	609.1	19.6	1878.3	20.9	3607.7	19.8
Industry - metallurgy	254.2	8.2	278.6	9.3	319.9	10.3	852.7	9.3	321.6	10.4	269.5	9.6	261.2	8.4	852.3	9.5	1705.0	9.4
- chemistry	259.4	8.4	282.0	9.4	335.3	10.8	876.7	9.5	356.5	11.5	321.7	11.5	348.0	11.2	1026.2	11.4	1902.9	10.5
including RSA funds	1601.8	51.7	3024.3	100.8	3922.2	126.5	8548.3	92.9	3965.2	127.9	3339.1	119.3	2691.5	86.8	9995.8	111.1	18544.1	101.9
- population	1131.6	36.5	1806.0	60.2	2299.5	74.2	5237.1	56.9	2385.3	76.9	1975.5	70.6	1526.4	49.2	5887.2	65.4	11124.3	61.1
- heat energy	389.6	12.6	1088.5	36.3	1426.3	46.0	2904.4	31.6	1437.8	46.4	1222.5	43.7	949.2	30.6	3609.5	40.1	6513.9	35.8
OTE	175.8	5.7	178.0	5.9	224.1	7.2	577.9	6.3	241.8	7.8	217.0	7.8	160.3	5.2	619.1	6.9	1197.0	6.6

AMERICAN OVERSIGHT

Scenario No 2: Without gas supply from Gazprom
Calculated Ukrainian balance for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3229,9	104,2	4717,8	157,3	5794,4	186,9	13742,1	149,4	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	28116,5	154,5
including																		
Import, including	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
"Gazprom" PJSC	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
from Europe	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
Domestic production	1679,9	54,2	1650,3	55,0	1726,4	55,7	5056,6	55,0	1692,4	54,6	1532,3	54,7	1689,3	54,5	4914,0	54,6	9970,6	54,8
Offtake from UGSF	500,0	16,1	1276,0	42,5	3186,0	102,8	4962,0	53,9	3933,0	126,9	2973,0	106,2	2132,2	68,8	9038,2	100,4	14000,2	76,9
Injection into UGSF	149,9	4,8	0,0	0,0	0,0	0,0	149,9	1,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	149,9	0,8
Ukraine, total	3080,0	99,4	4717,8	157,3	5794,4	186,9	13592,2	147,7	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	27966,6	153,7
including																		
Consumers	2904,2	93,7	4539,8	151,3	5570,3	179,7	13014,3	141,5	5537,3	178,6	4556,8	162,7	3661,2	118,1	13755,3	152,8	26769,6	147,1
including RSA funds	1601,8	51,7	3024,3	100,8	3922,2	126,5	8548,3	92,9	3965,2	127,9	3339,1	119,3	2691,5	86,8	9995,8	111,1	18544,1	101,9
OTE	175,8	5,7	178,0	5,9	224,1	7,2	577,9	6,3	241,8	7,8	217,0	7,8	160,3	5,2	619,1	6,9	1197,0	6,6

* In "consumers" category the volumes of gas consumption in ATO zone has not been included. It amounts to around 450 mln. c.m. per month (15-20 mln.c.m. per day) ** Consumption is calculation based on the assumption of mildly cold winter.
*** Values for gas offtake from UGSF were accepted on the maximum process level, including remains during offtake period. It amounts to 19 bln. c.m., including 4.8 bln.c.m. for process stock reserve

AMERICAN OVERSIGHT

Coal

1. Overview

While nuclear power plants are used for baseload power in Ukraine, coal-fired power plants operate in intermediate and peaking modes. Therefore, coal-fired units are most essential during the high power-consumption periods of winter and summer. Having adequate fuel supplies on hand during these seasons (especially winter) is of crucial importance in terms of maintaining reliable electricity supply. The following section presents recommendations that address these factors.

2. Coal Market

Coal from non-government controlled Donbas, which previously provided all anthracite and a significant part of gas coal (G-coal), is no longer available. Ukraine is converting some plants to burn G-coal rather than anthracite, significantly reducing Ukraine's reliance on anthracite. More than 80 percent of coal is produced by private company DTEK, which operates the most productive mines. The remaining state-owned mines have been united in the new National Coal Company. The main buyers of thermal coal are the private company DTEK and state-owned Centrenergo. Because of the method NKREKP uses to regulate electricity tariffs, coal prices in Ukraine are the highest in Europe. Ukraine is highly dependent on coal resources and it needs a more transparent system for maintaining and pricing supplies.

3. Reliance on Anthracite

Russian anthracite appears to be the Achilles heel of Ukraine's coal supply. Although some coal-fired power plant units have already converted from burning anthracite to burning bituminous coal and more are planned, a number of power plant units still burn anthracite. Ukraine is forced to import roughly one fourth of the coal it consumes, approximately 80 percent of which is anthracite imported from Russia. If that supply is disrupted during severe winter cold or summer heat or when one of Ukraine's nuclear power plants goes offline, then Ukraine's electric supply could be negatively affected. The world markets for coal are dominated by bituminous and subbituminous coals, so the reliance on Russian anthracite necessarily constrains Ukraine's alternative fuel supply options.

4. Ensuring Sufficient Supplies

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE-19-1271-O-001207

DOE b(1)

Deleted

5. **Railway and port infrastructure for Coal transloading and transportation to National Thermal Power Plants**

Planning Factor	Capacity
Thermal Power Plants (TPP) and Coal Consumption	Deleted
Freight rail cars (of all types)	
Transportation of coal by rail	
Transportation of coal by sea through the Odessa region sea ports (includes Illichivsk, Pivdenny, TIC)	
Transportation of coal through all ports	

DOE b(1)

AMERICAN OVERSIGHT

1. Overview

District heating plays an important role in Ukraine serving almost 60 percent of the population with over 25 million customers (Eurostat). Municipalities and communal users account for over 40 percent of heat energy usage. Natural gas serves as the dominant fuel. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes.

2. Threats to Combined Heat and Power (CHP) System

For household heating the main threats to ensuring the established operating conditions for heat sources (boiler houses and CHP), which supply thermal energy to public institutions and to communities in Ukraine, and the reliable and safe operation of the heating energy sector production, transmission and delivery entities (heating and hot water supply) are:

DOE b(1)

- Fuel shortfall (decrease of operational fuel stockpiles at boiler houses and CHP below levels Deleted);
- Insufficient gas delivery volumes or gas pressure decrease in the main and distribution gas networks to the heating sector enterprises;
- Complete cessation or emergency cut-off of the gas supply to the heating sector enterprises;
- Cessation of power supply and water supply to the heating energy sector enterprises as a consequence of an emergency in the electric energy sector.

3. Response Measures to Remove Threats to Communal Heating Enterprises

The heat equipment of communal heating enterprises, according to the applicable Ukrainian legislation, falls into high-risk facilities category, and, consequently, has emergency response plans for all facilities (broken down by the categories of a boiler house, heating network area and central heat distribution station) approved according to a procedure established by legislation. There is an emergency stock of necessary materials and spare parts.

Emergency response exercises help personnel understand procedures and respond in a prompt manner during crisis events. In every specific situation, preparedness allows for a calculation analysis to identify the stability of heating networks and of building heating systems. This calculation then triggers a sequence of actions to prevent negative effects of a potential blackout.

4. Preparedness Measures for Emergencies in the Heat and Power Engineering Sector

AMERICAN OVERSIGHT

DOE-19-1271-O-001209

The following measures should be taken in order to prevent possible threats to the heat and power energy sector:

- Ensure fulfillment of proposals regarding purchase of fuel (coal and mazut) and establish policies to implement a more transparent and cost reflective tariff setting process.
- A check of actual conditions and operability using backup fuel (in the case of natural gas as primary fuel and heavy oil as reserve fuel), etc.
- Ensure heavy oil purchase in the volumes required for a sustainable fall-winter period.
- Ensure the availability of backup sources of power and water supply.
- The implementation of energy conservation measures for all types of properties for the fall-winter period.
- Consideration of the possibility of shifting vacation periods at all education institutions and prolongation of vacations. Development of a mechanism for implementation of new terms and duration, if necessary.
- Development of prioritization lists of consumers' groups in the event of the possible shutoff of the heating system.
- The development of messaging by the Ministry of Regional Development and Construction to limit consumption of heating and distribution using billboards and posters; TV commercials, radio, press and text messages for mobile phones; electronic payment systems, heating utility bills; and letters by the Ministry of Regional Development and Construction to industrial enterprises indicating the reasons for limitations in heating consumption and recommending measures to be taken;
- Extension of the term of hot water supply shutoff for the population and public institutions.

5. Fuel switching to Mazut

DOE b(1)

The estimated consumption of natural gas at TPPs and CHPs during fall-winter 2019-20 amounts Deleted. Taking into account the technical and process capacity on TPPs of generating companies and CHPs (current mazut equipment stock is in satisfactory technical condition or in out of use state and can start its operation after routine maintenance, proper condition of access roads or mazut pipelines) the following are suggested:

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

Transportation of heavy oil by rail	Deleted	DOE b(1)

6. Planning

A prolonged cut-off in natural gas supplies during the winter heating season carries the potential to trigger a crisis for household heating, particularly in the event of below-average temperatures. Preparedness entails establishing a system of public outreach to ensure reduction in consumption by both households and industry. The following actions should be taken for district heating systems in the event of a cut-off in natural gas supplies:



Deleted

DOE b(1)

AMERICAN OVERSIGHT

DOE-19-1271-O-001211

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

RESPONSE

AMERICAN OVERSIGHT

DOE-19-1271-O-001213

Page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-001214

EMERGENCY RESPONSE

1. Overview

DOE b(1)

This section details Ukraine's emergency response procedure in the event of a major system accident. A major system accident is an accident leading to power loss at a greater part of Ukraine's territory and loss of own needs generation at combined heat power and nuclear power plants followed Deleted A major system accident may be preceded with:

- Gradual increase in generation capacity shortage;
- Sudden loss of major generation capacity;
- Emergency shut-down of several system-forming transmission lines of the main grid.

Scenarios where a major system accident become possible include conditions where the Unified Energy Systems of Russia and Belarus are operated separately, or when there is a major shortage of generation capacity and the Unified Energy System of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus.

2. Major Tasks for All-level Operating and Dispatch Personnel

Major tasks for all-level operating and dispatch personnel in the event of a major system accident include:

DOE b(1)

1. Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001215

DOE b(1)

Deleted

3. Prevention of accident evolving into a special system wide collapse

Personnel should undertake the following procedures in the case of separate operation of the UES of Ukraine from the Unified Energy Systems of Russia and Belarus consistent with

DOE b(1)

Deleted

3. Recovery after a special (extreme) system wide collapse and restoration of a greater part of the Unified Energy System of Ukraine «from 0».

AMERICAN OVERSIGHT

DOE-19-1271-O-001216

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted



AMERICAN OVERSIGHT

DOE-19-1271-O-001220

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001225

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001226

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001231

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001232

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION
MODIFIED HANDLING AUTHORIZED-

From: Tumminia, Paul
To: McAninch, Constance I (Kyiv); Noel, Emily E; Buchan, Samuel
Cc: Vogt, Christopher J; Jayanti, Suriya C (Kyiv)
Subject: RE: Champion for WAP?
Date: Monday, August 05, 2019 9:56:00 AM
Attachments: Ukraine Winter Action Plan 2019-2020_Short.docx

Connie:
I did speak with Nick, and AMB Sondland did not raise.

(b) (5)

As for objectives/agenda. The visit by the team does not have one meeting? It's many meetings with stakeholders over the course of several days. I will look for a work plan from 2015 to see if I can share. As for objectives, I don't have a specific objectives paper, but we have shared the template that Nick prepared and it describes all of the meetings we wish to have. Thanks, -p

From: McAninch, Constance I (Kyiv) [mailto:McAninchCI@state.gov]
Sent: Monday, August 05, 2019 9:20 AM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>; Noel, Emily E <emily.noel@hq.doe.gov>
Cc: Vogt, Christopher J <christopher.vogt@pnnl.gov>; Jayanti, Suriya C (Kyiv) <JayantiSC@state.gov>
Subject: [EXTERNAL] Champion for WAP?

Hi Paul,

(b) (5)

I think it would help a lot if we had meeting objectives and/or a sample agenda for the meeting we are planning in September. Is there an agenda from a previous meeting I can use as an example? Can I see it by tomorrow?

Thanks,

Constance McAninch
DOE Office
U.S. Embassy – Kyiv
mcaninchci@state.gov
(office) 011-380-521-5702
(cell) +(b) (6)

~~Attachment contains C/FGI-MOD.~~
~~When separated this email is UNCLASSIFIED.~~

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
_____ **DATE** 4/23/20

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
~~CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION~~
~~-MODIFIED HANDLING AUTHORIZED-~~

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION

_____ **DATE** 11/23/20

UKRAINE'S WINTER ENERGY SECURITY PREPAREDNESS AND RESPONSE PLAN II

2019-2020

Ukraine's "Winter Energy Security Preparedness Plan" outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing natural gas storage, and expanding the natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. This is the second iteration of Ukraine's Winter Energy Security Preparedness and Response Plan.

~~**Derivative Declassifier review required prior to declassification**~~

~~**Classified by: Matt B. Moury, AU-1, DOE**~~
~~**Reason: 1.4(b)(d)**~~
~~**Declassifiy on: 20451115**~~

~~**C/FGI-MOD**~~

AMERICAN OVERSIGHT

Page intentionally left blank.

AMERICAN OVERSIGHT

EXECUTIVE SUMMARY

1. Overview

Ukraine's "Winter Energy Security Preparedness and Response Plan" (The Plan) outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximize natural gas storage and expand natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. The Plan defines the following areas:

- Key preparedness measures to help mitigate threat emergency situations in the energy sector; and
- Key response actions to disruptions to power supply systems, district heating and heat generation facilities, and supply of energy resources.

DOE b(1)

Deleted



2. Stakeholder Engagement

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication in the event of a crisis. The Plan provides guidance, *inter alia*, for the following national authorities:

- Ministry of Energy and Coal Industry
- Ministry of Regional Development, Building and Housing

AMERICAN OVERSIGHT

- Ministry of Internal Affairs
- Ministry of Infrastructure
- Ministry of Defense
- Ministry of Health
- Ministry of Social Policy
- National Electricity Regulatory Commission
- State Nuclear Regulatory Inspectorate
- State Emergency Service
- Naftogaz
- Ukrenergo
- Energoatom
- State Energy Efficiency and Conservation Agencies
- State Highway Agency
- State Special Communication and Data Protection Service
- Local self-government authorities

3. Electricity Generation



Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of

AMERICAN OVERSIGHT

0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.

The Plan's electric generation recommendations section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial electricity users have a sufficient supply for the 2019-2020 heating season. This includes increasing coal influx, reducing electric power consumption, increasing imports and reducing exports of electricity, and opening congested transmission pathways by completing interconnection lines (e.g. high voltage lines (HVL) to shift energy from Rivne to the Kyiv substation). Preparedness measures for emergencies in heat and power engineering sector include:

Natural Gas



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz should maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

4. Coal

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase coal production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

A-type coal *(assuming a baseline supply of 300 kTons/month)*:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

5. District Heating

District heating provides a measure to provide space heating and water heating to the majority of Ukrainian residences. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes. A crisis triggers additional actions:



DOE
b(1)

Deleted

6. Crisis Response

Stakeholders at the national, regional and local levels should prepare for emergency response scenarios in the event of a crisis. Scenarios where a major system accident becomes possible include when the Unified Energy Systems of Russia and Belarus are operated separately, or when there's a major shortage of generation capacity and the Unified Energy System (UES) of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus. On exceeding the maximum allowed power exchange, stability of the UES of Ukraine may be breached at connections with Russia and Belarus, and UES of Ukraine may be automatically separated by

AMERICAN OVERSIGHT

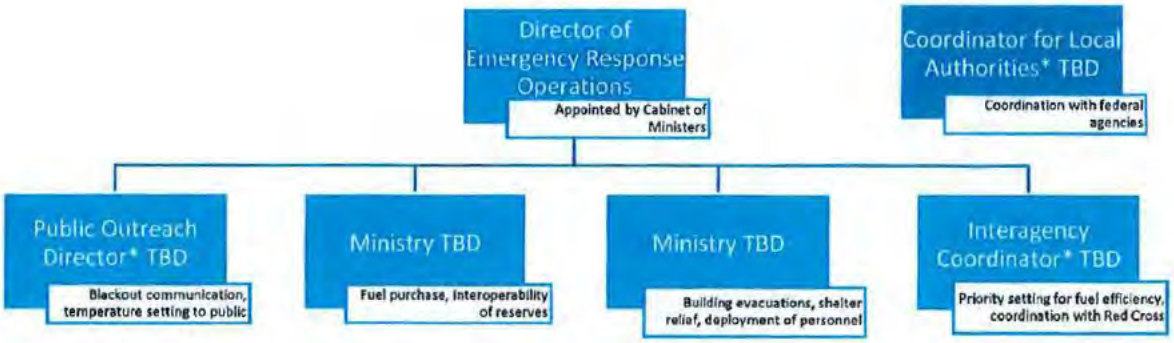
DOE-19-1271-O-001245

actuating devices counteracting asynchronous operation under generation capacity shortage.

DOE b(1)

Deleted

Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



AMERICAN OVERSIGHT

PREPAREDNESS

AMERICAN OVERSIGHT

DOE-19-1271-O-001247

Page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-001248

STAKEHOLDERS

1. Overview

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication and help energy sector decision in the event of a crisis. Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



2. Ministry of Energy and Coal Industry

The Ministry of Energy and Coal Industry of Ukraine is the primary central government agency responsible for electricity sectors policies; the civil-nuclear complex, oil and gas sector; and coal industry. The ministry operates under the authority of the Cabinet of Ministers.

3. Ministry of Regional Development, Building and Housing

The Ministry for Regional Development, Building and Housing of Ukraine is responsible for housing infrastructure development and the formation and implementation of state policy in order to create a comfortable, high quality and safe living space for human development. The ministry advances energy planning and implementation efforts by increasing the competitiveness of regions (energy investment and reform) and promoting energy efficiency in the housing and utilities sector.

4. Ministry of Internal Affairs

The Ministry of Internal Affairs executes state policy for the protection of rights and liberties of citizens, investigates unlawful acts against the interest of society and state, fights crime, provides civil order, ensures civil security, and regulates traffic safety. The Ministry also protects energy infrastructure.

AMERICAN OVERSIGHT

5. Ministry of Infrastructure

The Ministry of Infrastructure formulates and implements state policy in the fields of air, road, rail, sea, river and urban electric transport, as well as on issues related to the use of subway systems, roads, transportation safety, merchant shipping and navigational/hydrographic support for vessels. The Ministry has programs for improving energy efficiency in the transportation and communications sectors.

6. Ministry of Defense

The Ministry of Defense is responsible for preventing hostility, structuring the military, and repelling all types of aggression (both in country and internationally). The Ministry has been integrating energy efficiency into its military programs across the country. Under the new Cyber Security Strategy, the Ministry will be responsible for implementing cybersecurity protection, as cyberattacks against energy infrastructure is common.

7. Ministry of Health

The Ministry of Health is the main healthcare body of the central government, responsible for managing the universal healthcare system and implementing state policy in the fields of medicine and healthcare. The Ministry has an interest in reducing illness linked to pollution and nuclear safety.

8. Ministry of Social Policy

The Ministry of Social Policy is responsible for regulating labor relations, family and children, immigration and trafficking, women's rights, children's rights, and humanitarian aid. The Ministry is also involved in an inter-agency working group for assessing and managing regulatory reforms for energy performance contracts and supporting activities.

9. National Electricity Regulatory Commission (NERC)

The NERC is involved in the formation and enforcement of a unified state policy towards electricity markets, natural gas, petroleum and petroleum products in the areas of heating, centralized water supply and drainage, treatment and disposal of household waste. The NERC is responsible for the licensing of economic activities in the fields of electricity, heating, centralized water supply and drainage in the oil and gas sector. The NERC sets the prices (tariffs) for electricity, for the supply of natural gas and gas (methane) of coal deposits, and other tariffs.

10. State Nuclear Regulatory Inspectorate (SNRI)

SNRI is the central government executive authority responsible for formation and implementation of state policy in the field of nuclear and radiation safety. The SNRI sets criteria, requirements and conditions of safety in nuclear energy use (normative documents, standards), issues permits and licenses to carry out activities in this area (licensing), and exercises the state supervision for observance of legislation, norms, rules and standards of nuclear and radiation safety (supervision).

AMERICAN OVERSIGHT

11. State Emergency Service (SES)

The SES implements state policies in the domain of civil protection, protection of population and territories from emergencies, prevention of emergencies, rectification of emergency consequences, rescue work, fire extinguishing, fire and technogenic safety, accident rescue service activities and hydrometeorologic activities. The former Ministry was created from the consequences of the Chernobyl catastrophe. The SES is a central body of executive power with activities directed and coordinated by the Cabinet of Ministers through the Ministry of Internal Affairs.

12. Naftogaz

Naftogaz is the national oil and gas company of Ukraine; it is a state-owned company. The company is involved with extraction, transportation, and refinement of natural gas and crude oil. Naftogaz operates under the Ministry of Energy and Coal Mining.

13. Ukrenergo

UKRENERGO is a national power company responsible for operational and technological control of the Integrated Power System (IPS) of Ukraine and electricity transmission via trunk power grids from generating plants to the distribution networks of the regional electricity suppliers (*oblenergos*). UKRENERGO is a state enterprise that covers the entire territory of Ukraine.

14. Energoatom

The National Nuclear Energy Generating Company of Ukraine (Energoatom) is a state enterprise operating all four active nuclear power stations in Ukraine. Energoatom operates under the Ministry of Fuel and Energy.

15. State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE)

The SAEE is a central executive authority governed and coordinated by the Cabinet of Ministers of Ukraine and is responsible for developing and implementing energy efficiency and renewable energy government policy.

16. State Highway Agency

Transport of fuel fossils (i.e. oil and gas) is under the Ministry on Energy and Fuel, while most of security responsibility matters are supervised by Ministry of Interior or other state agencies. The Ministry of Infrastructure only implements government policies related to the transport and communication sectors as well as security related to transport.

17. State Service of Special Communications and Information Protection

The State Service of Special Communications and Information Protection of Ukraine is responsible for protecting state information within data networks, safeguarding the critical

AMERICAN OVERSIGHT

information infrastructure, technical security, and intelligence services for the Administration.

18. Local self-government authorities

There are 24 regions in Ukraine and each one is divided into districts. The President of Ukraine and his Cabinet of Ministers appoint the heads of local governments. The city councils are tasked with disaster relief efforts and safety programs that protect population groups from natural disasters.

AMERICAN OVERSIGHT

AMERICAN OVERSIGHT

DOE-19-1271-O-001253

POWER SECTOR

1. Overview

Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of 0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.



2. Threats to the Power Sector

The following constitute the primary threats to steady-state operation of Ukraine's electricity sector:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

NATURAL GAS

1. Overview

This section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial oil and natural gas users have sufficient supply for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing domestic natural gas production, and expanding the natural gas reverse flow capacity from the European Union (EU).



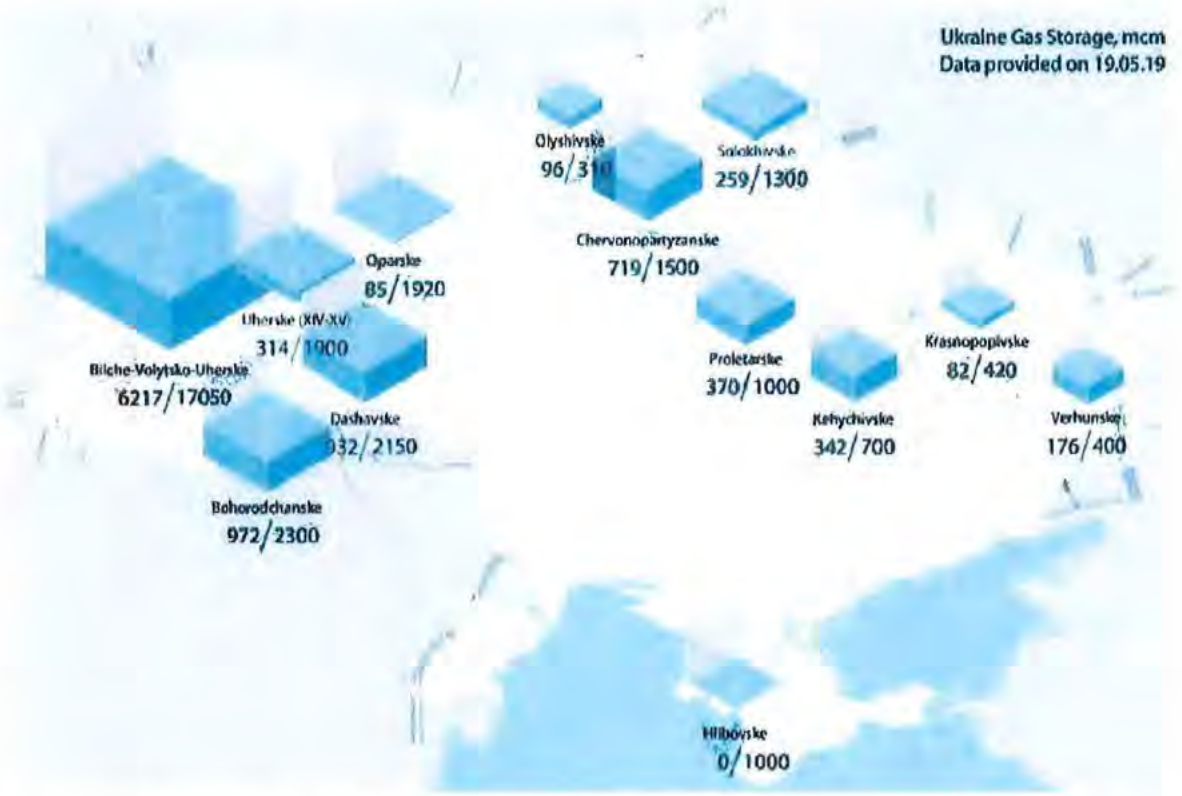
2. Zero-Transit Scenario

Ukraine is actively preparing for the possibility of a cut-off of Russian natural gas transit to Europe and Turkey via the Ukrainian Gas Transit System (GTS) this winter. Since 2014, Gazprom has used Ukraine's GTS to ship between 60-90 billion cubic meters of gas per year (bcma) to Europe and Turkey (equivalent to 12-18 percent of European Union gas demand). Western European energy markets may be able to withstand a prolonged cutoff with purchases of liquefied natural gas (LNG). This is not the case for a number of relatively unintegrated countries in Central and Southeastern Europe (notably Bulgaria and Moldova) dependent on Russia as a dominant—and many times sole—supplier. The most vulnerable country could be Ukraine itself. If Ukraine has not preemptively imported and stored adequate volumes of gas and Gazprom cuts off gas shipments to Europe via Ukraine, the country could face a serious energy crises. Key points include:

AMERICAN OVERSIGHT

- A prolonged disruption of Russian natural gas supplies will put stress on European gas markets and potentially limit Ukraine's ability to contract for West-East supplies.
- Adding additional reverse flow capacity from existing pipeline infrastructure with neighboring countries is technically feasible by reconfiguring compression stations.
- Creative options such as virtual reverse flows and contracting with other countries to book capacity within Ukraine's large gas storage system present more ways to build resilience.
- A coordinated push to find financing opportunities from international financial institutions or the Eurobond market to allow Naftogaz or independent traders to purchase gas supplies to build storage will be key.

3. Storage



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz wants to maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage

AMERICAN OVERSIGHT

DOE-19-1271-O-001257

facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

As Ukraine is currently using only about a third of its reverse flow capacity from the EU, the biggest obstacle in increasing natural gas storage injection levels to at least 60 MMcm/d is financial, not technical. Inadequate finances are also an obstacle to the option of Ukraine restoring gas supplies from Russia's Gazprom. Naftogaz needs to secure adequate credit in order to increase natural gas purchases and is encouraged to pursue all avenues to do so.

The Government of Ukraine should consider direct financing from the state budget to cover the shortfall in natural gas storage. Furthermore, Naftogaz needs to call for the reinstatement of natural gas curtailment measures. Curtailing domestic natural gas consumption will free up additional volumes of domestic production to be injected into underground storage.

4. Opening Greater Reverse Flow Capacity

Ukraine currently consumes approximately 30 bcm of natural gas per year. Domestic production meets two-thirds of this demand. A reverse flow-pipeline from Slovakia that returns the Russian gas to Ukraine once it crosses into the European Union supplies the remaining 10 bcm. Ukraine, the most energy intensive economy in Europe, uses most of the gas for household consumption and communal heating systems, as well as heavy industry. State-owned natural gas company Naftogaz is currently planning for a zero-transit scenario following the expiration of their long-term transit contract with Russia's Gazprom on December 31, 2019. This includes the need to not only expand routes from neighboring countries but also build sufficient storage supplies to maintain enough compression within the system for West-East flows. Ukraine's options include:

- **Slovakia:** Slovakia's system is the most capable of delivering additional supplies to Ukraine. Ukraine transit supplies enter the EU at the Veľké Kapušany compressor station in Eastern Slovakia. The station's total power of nearly 300 MW—the largest compressor station in Europe—allows technical entry flow of approximately 70 bcm per year. Most of these supplies transit onward to the Central European Gas Hub in Baumgarten. Of these transit supplies, an average of 8 bcm per year reverse flow back into Ukraine through the Bundice border point via the Vojany-Uzhorod pipeline. Absent East-West transit supplies, Slovakia's capacity would technically be free for sizeable flows of European gas to Ukraine. However, many EU Member States may themselves struggle to meet gas demand in the event of a prolonged cut-off. Moreover, Eustream believes that reversing the four lines at Veľké Kapušany would violate the agreement under which Gazprom has booked most of the capacity of the lines entering from Ukraine until 2028.

- **Poland:** Poland's current capacity to deliver reverse flow natural gas supplies to Ukraine stands at 1.5 bcma via the Drozdowice interconnector on the Poland-Ukraine border; the first reversed flows began in April 2014 in the wake of the Ukraine-Russia conflict under a 2012 deal with German utility RWE. The gas transits through Poland's Gaz-System with deliveries based on European wholesale price levels. Increasing the reverse flow capacity to the interconnector's 5 bcm capacity would probably require adding additional reverse compression. Technically, this would likely entail moving a mobile compression turbine from another station. Other discussions such as the Hermanowice interconnector, expanding

AMERICAN OVERSIGHT

the Świnoujście LNG terminal and Baltic Pipe present future, medium-term opportunities to expand north-south flows.

- **Hungary:** Three interconnector pipelines cross the Ukraine-Hungary border with one built with a reverse flow mode. The two others are sufficient to provide Hungary's full imports from Russia for domestic consumption, storage, and transit. This provides the potential to reverse flow 7.1 bcm to Ukraine. In the event of a supply shutoff from Russia to Ukraine, Hungary would utilize stored gas and try to find new supplies elsewhere, some via LNG. This will have impacts on Hungary's gas system configuration—as well as available supply—to enter into Ukraine.

- **Romania:** The Trans-Balkan pipeline through Ukraine transports about 20 bcm of natural gas through Romania to Bulgaria, Greece, Macedonia, and Turkey. When and if those shipments are halted, Ukrtransgaz hopes to equip Transit 1 pipeline—one of the three connections that form the Trans-Balkan pipeline—with physical reverse-flow capabilities. The facility could allow up to 5 bcm in additional supplies to be shipped to Ukraine. Romania's current upstream natural gas production could make this an attractive medium-term option if Black Sea gas development goes forward..

- **Virtual reverse flow:** European customers sometimes trade gas through an accounting mechanism known as "virtual reverse flow" whereby less physical gas is delivered downstream and the upstream recipient pays the downstream customer. Virtual reserve flow would permit Naftogaz to decrease physical gas shipments to Slovakia or Poland to divert the gas into Ukrainian gas storage or sell into the mid-stream market. This would not require physical reverse flow capability from the transmission network.

AMERICAN OVERSIGHT

Scenario No. 1: With gas supplies from Gazprom for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3187.8	102.8	4726.1	157.5	5796.9	187.0	13710.8	149.0	5833.5	188.2	4842.0	172.9	3805.0	122.7	14480.5	160.9	28191.3	154.9
Import	892.2	28.8	946.3	31.5	1517.0	48.9	3355.5	36.5	1991.8	64.3	2125.5	75.9	1653.7	53.3	5771.0	64.1	9126.5	50.1
including Gazprom PJSC	0.0	0.0	0.0	0.0	518.2	16.7	518.2	5.6	924.6	29.8	927.9	33.1	304.4	9.8	2156.9	24.0	2675.1	14.7
from Europe	892.2	28.8	946.3	31.5	998.8	32.2	2837.3	30.8	1067.3	34.4	1197.6	42.8	1349.3	43.5	3614.2	40.2	6451.5	35.4
Domestic production	1679.9	54.2	1650.3	55.0	1726.4	55.7	5056.6	55.0	1692.4	54.6	1532.3	54.7	1689.3	54.5	4914.0	54.6	9970.6	54.8
Offtake from	615.7	19.9	2129.5	71.0	2553.5	82.4	5298.7	57.6	2149.3	69.3	1184.2	42.3	462.0	14.9	3795.5	42.2	9094.2	50.0
UGSF* injection into UGSF	112.9	3.6	0.0	0.0	0.0	0.0	112.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.9	0.6
Ukraine, total	3080.0	99.4	4717.8	157.3	5794.4	186.9	13592.2	147.7	5779.1	186.4	4773.8	170.5	3821.5	123.3	14374.4	159.7	27966.6	153.7
including																		
Consumers	2904.2	93.7	4539.8	151.3	5570.3	179.7	13014.3	141.5	5537.3	178.6	4556.8	162.7	3661.2	118.1	13755.3	152.8	26769.6	147.1
including Ministry of	513.6	16.6	560.6	18.7	655.2	21.1	1729.4	18.8	678.0	21.9	591.2	21.1	609.1	19.6	1878.3	20.9	3607.7	19.8
Industry - metallurgy	254.2	8.2	278.6	9.3	319.9	10.3	852.7	9.3	321.6	10.4	269.5	9.6	261.2	8.4	852.3	9.5	1705.0	9.4
- chemistry	259.4	8.4	282.0	9.4	335.3	10.8	876.7	9.5	356.5	11.5	321.7	11.5	348.0	11.2	1026.2	11.4	1902.9	10.5
including RSA funds	1601.8	51.7	3024.3	100.8	3922.2	126.5	8548.3	92.9	3965.2	127.9	3339.1	119.3	2691.5	86.8	9995.8	111.1	18544.1	101.9
- population	1131.6	36.5	1806.0	60.2	2299.5	74.2	5237.1	56.9	2385.3	76.9	1975.5	70.6	1526.4	49.2	5887.2	65.4	11124.3	61.1
- heat energy	389.6	12.6	1088.5	36.3	1426.3	46.0	2904.4	31.6	1437.8	46.4	1222.5	43.7	949.2	30.6	3609.5	40.1	6513.9	35.8
OTE	175.8	5.7	178.0	5.9	224.1	7.2	577.9	6.3	241.8	7.8	217.0	7.8	160.3	5.2	619.1	6.9	1197.0	6.6

AMERICAN OVERSIGHT

Scenario No 2: Without gas supply from Gazprom
Calculated Ukrainian balance for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3229,9	104,2	4717,8	157,3	5794,4	186,9	13742,1	149,4	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	28116,5	154,5
including																		
Import, including	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
"Gazprom" PJSC	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
from Europe	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
Domestic production	1679,9	54,2	1650,3	55,0	1726,4	55,7	5056,6	55,0	1692,4	54,6	1532,8	54,7	1689,3	54,5	4914,0	54,6	9970,6	54,8
Offtake from UGSF	500,0	16,1	1276,0	42,5	3186,0	102,8	4962,0	53,9	3933,0	126,9	2973,0	106,2	2132,2	68,8	9038,2	100,4	14000,2	76,9
Injection into UGSF	149,9	4,8	0,0	0,0	0,0	0,0	149,9	1,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	149,9	0,8
Ukraine, total	3080,0	99,4	4717,8	157,3	5794,4	186,9	13592,2	147,7	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	27966,6	153,7
including																		
Consumers	2904,2	93,7	4539,8	151,3	5570,3	179,7	13014,3	141,5	5537,3	178,6	4556,8	162,7	3661,2	118,1	13755,3	152,8	26769,6	147,1
including RSA funds	1601,8	51,7	3024,3	100,8	3922,2	126,5	8548,3	92,9	3965,2	127,9	3339,1	119,3	2691,5	86,8	9995,8	111,1	18544,1	101,9
OTE	175,8	5,7	178,0	5,9	224,1	7,2	577,9	6,3	241,8	7,8	217,0	7,8	160,3	5,2	619,1	6,9	1197,0	6,6

* In "consumers" category the volumes of gas consumption in ATO zone has not been included. It amounts to around 450 mln. c.m. per month (15-20 mln.c.m. per day) ** Consumption is calculation based on the assumption of mildly cold winter.
*** Values for gas offtake from UGSF were accepted on the maximum process level, including remains during offtake period. It amounts to 19 bln. c.m., including 4.8 bln.c.m. for process stock reserve

AMERICAN OVERSIGHT

Coal

1. Overview

While nuclear power plants are used for baseload power in Ukraine, coal-fired power plants operate in intermediate and peaking modes. Therefore, coal-fired units are most essential during the high power-consumption periods of winter and summer. Having adequate fuel supplies on hand during these seasons (especially winter) is of crucial importance in terms of maintaining reliable electricity supply. The following section presents recommendations that address these factors.

2. Coal Market

Coal from non-government controlled Donbas, which previously provided all anthracite and a significant part of gas coal (G-coal), is no longer available. Ukraine is converting some plants to burn G-coal rather than anthracite, significantly reducing Ukraine's reliance on anthracite. More than 80 percent of coal is produced by private company DTEK, which operates the most productive mines. The remaining state-owned mines have been united in the new National Coal Company. The main buyers of thermal coal are the private company DTEK and state-owned Centrenergo. Because of the method NKREKP uses to regulate electricity tariffs, coal prices in Ukraine are the highest in Europe. Ukraine is highly dependent on coal resources and it needs a more transparent system for maintaining and pricing supplies.

3. Reliance on Anthracite

Russian anthracite appears to be the Achilles heel of Ukraine's coal supply. Although some coal-fired power plant units have already converted from burning anthracite to burning bituminous coal and more are planned, a number of power plant units still burn anthracite. Ukraine is forced to import roughly one fourth of the coal it consumes, approximately 80 percent of which is anthracite imported from Russia. If that supply is disrupted during severe winter cold or summer heat or when one of Ukraine's nuclear power plants goes offline, then Ukraine's electric supply could be negatively affected. The world markets for coal are dominated by bituminous and subbituminous coals, so the reliance on Russian anthracite necessarily constrains Ukraine's alternative fuel supply options.

4. Ensuring Sufficient Supplies

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE-19-1271-O-001262

Deleted

DOE b(1)

5. **Railway and port infrastructure for Coal transloading and transportation to National Thermal Power Plants**

Planning Factor	Capacity
Thermal Power Plants (TPP) and Coal Consumption	Deleted
Freight rail cars (of all types)	
Transportation of coal by rail	
Transportation of coal by sea through the Odessa region sea ports (includes Illichivsk, Pivdenny, TIC)	
Transportation of coal through all ports	

DOE b(1)

AMERICAN OVERSIGHT

District Heating

1. Overview

District heating plays an important role in Ukraine serving almost 60 percent of the population with over 25 million customers (Eurostat). Municipalities and communal users account for over 40 percent of heat energy usage. Natural gas serves as the dominant fuel. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes.

2. Threats to Combined Heat and Power (CHP) System

For household heating the main threats to ensuring the established operating conditions for heat sources (boiler houses and CHP), which supply thermal energy to public institutions and to communities in Ukraine, and the reliable and safe operation of the heating energy sector production, transmission and delivery entities (heating and hot water supply) are:

DOE b(1)

- Fuel shortfall (decrease of operational fuel stockpiles at boiler houses and CHP below levels Deleted);
- Insufficient gas delivery volumes or gas pressure decrease in the main and distribution gas networks to the heating sector enterprises;
- Complete cessation or emergency cut-off of the gas supply to the heating sector enterprises;
- Cessation of power supply and water supply to the heating energy sector enterprises as a consequence of an emergency in the electric energy sector.

3. Response Measures to Remove Threats to Communal Heating Enterprises

The heat equipment of communal heating enterprises, according to the applicable Ukrainian legislation, falls into high-risk facilities category, and, consequently, has emergency response plans for all facilities (broken down by the categories of a boiler house, heating network area and central heat distribution station) approved according to a procedure established by legislation. There is an emergency stock of necessary materials and spare parts.

Emergency response exercises help personnel understand procedures and respond in a prompt manner during crisis events. In every specific situation, preparedness allows for a calculation analysis to identify the stability of heating networks and of building heating systems. This calculation then triggers a sequence of actions to prevent negative effects of a potential blackout.

4. Preparedness Measures for Emergencies in the Heat and Power Engineering Sector

AMERICAN OVERSIGHT

The following measures should be taken in order to prevent possible threats to the heat and power energy sector:

- Ensure fulfillment of proposals regarding purchase of fuel (coal and mazut) and establish policies to implement a more transparent and cost reflective tariff setting process.
- A check of actual conditions and operability using backup fuel (in the case of natural gas as primary fuel and heavy oil as reserve fuel), etc.
- Ensure heavy oil purchase in the volumes required for a sustainable fall-winter period.
- Ensure the availability of backup sources of power and water supply.
- The implementation of energy conservation measures for all types of properties for the fall-winter period.
- Consideration of the possibility of shifting vacation periods at all education institutions and prolongation of vacations. Development of a mechanism for implementation of new terms and duration, if necessary.
- Development of prioritization lists of consumers' groups in the event of the possible shutoff of the heating system.
- The development of messaging by the Ministry of Regional Development and Construction to limit consumption of heating and distribution using billboards and posters; TV commercials, radio, press and text messages for mobile phones; electronic payment systems, heating utility bills; and letters by the Ministry of Regional Development and Construction to industrial enterprises indicating the reasons for limitations in heating consumption and recommending measures to be taken;
- Extension of the term of hot water supply shutoff for the population and public institutions.

5. Fuel switching to Mazut

DOE b(1)

The estimated consumption of natural gas at TPPs and CHPs during fall-winter 2019-20 amounts Deleted. Taking into account the technical and process capacity on TPPs of generating companies and CHPs (current mazut equipment stock is in satisfactory technical condition or in out of use state and can start its operation after routine maintenance, proper condition of access roads or mazut pipelines) the following are suggested:

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

DOE b(1)

Transportation of heavy oil by rail	Deleted

6. Planning

A prolonged cut-off in natural gas supplies during the winter heating season carries the potential to trigger a crisis for household heating, particularly in the event of below-average temperatures. Preparedness entails establishing a system of public outreach to ensure reduction in consumption by both households and industry. The following actions should be taken for district heating systems in the event of a cut-off in natural gas supplies:



DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001267

RESPONSE

AMERICAN OVERSIGHT

DOE-19-1271-O-001268

Page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-001269

EMERGENCY RESPONSE

1. Overview

DOE b(1)

This section details Ukraine's emergency response procedure in the event of a major system accident. A major system accident is an accident leading to power loss at a greater part of Ukraine's territory and loss of own needs generation at combined heat power and nuclear power plants followed Deleted A major system accident may be preceded with:

- Gradual increase in generation capacity shortage;
- Sudden loss of major generation capacity;
- Emergency shut-down of several system-forming transmission lines of the main grid.

Scenarios where a major system accident become possible include conditions where the Unified Energy Systems of Russia and Belarus are operated separately, or when there is a major shortage of generation capacity and the Unified Energy System of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus.

2. Major Tasks for All-level Operating and Dispatch Personnel

Major tasks for all-level operating and dispatch personnel in the event of a major system accident include:

DOE b(1)

1. Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001270

DOE b(1)

Deleted

3. Prevention of accident evolving into a special system wide collapse

Personnel should undertake the following procedures in the case of separate operation of the UES of Ukraine from the Unified Energy Systems of Russia and Belarus consistent with

DOE b(1)

Deleted

3. Recovery after a special (extreme) system wide collapse and restoration of a greater part of the Unified Energy System of Ukraine «from 0».

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted



AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

DOE
b(1)

AMERICAN OVERSIGHT

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 11/25/23

C/FGI-MOD
CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION
MODIFIED HANDLING AUTHORIZED

From: Tumminia, Paul
To: McAninch, Constance I (Kyiv); Noel, Emily E; Vogt, Christopher J
Cc: Kovalenko, Arina (DOE Kyiv); Parfeniuk, Liudmila (DOE Kyiv); Bell, Heather; Bell, Heather (Embassy KYIV); Smiley, Laura
Subject: RE: [EXTERNAL] RE: RE: DOE-ENR Mission to Poland Ukraine (September 8-12) AND Winter Action Planning
Date: Monday, August 12, 2019 8:11:00 AM
Attachments: Ukraine Winter Action Plan 2019-2020_Short.docx

Connie:
I am not quite sure what you are looking for, to be honest.
Here are some TP's from S1's meeting paper with President Z. with some additions. Is this what you are looking for?

(b) (5)

(b) (5)

Attachment contains C/FGI-MOD.
When separated this email is UNCLASSIFIED.

C/FGI-MOD

AMERICAN OVERSIGHT

~~C/FGI-MOD~~
~~CONFIDENTIAL FOREIGN GOVERNMENT INFORMATION~~
~~-MODIFIED HANDLING AUTHORIZED-~~

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
_____ DATE 11/23/20

UKRAINE'S WINTER ENERGY SECURITY PREPAREDNESS AND RESPONSE PLAN II

2019-2020

Ukraine's "Winter Energy Security Preparedness Plan" outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing natural gas storage, and expanding the natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. This is the second iteration of Ukraine's Winter Energy Security Preparedness and Response Plan.

~~Derivative Declassifier review required prior to declassification~~

~~Classified by: Matt B. Moury, AU-1, DOE~~
~~Reason: 1.4(b)(d)~~
~~Declassifiy on: 20451115~~

~~C/FGI-MOD~~

AMERICAN OVERSIGHT

Page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-001296

EXECUTIVE SUMMARY

1. Overview

Ukraine's "Winter Energy Security Preparedness and Response Plan" (The Plan) outlines a series of measures to ensure sufficient energy supplies for residential, industrial and commercial energy consumers for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximize natural gas storage and expand natural gas reverse flow capacity from the European Union (EU). Additional findings of this planning effort include the need to incorporate training on crisis response coordinating structures and procedures. Training for these recommendations should include comprehensive exercises at all levels to organize and prepare for a crisis response scenario. The Plan defines the following areas:

- Key preparedness measures to help mitigate threat emergency situations in the energy sector; and
- Key response actions to disruptions to power supply systems, district heating and heat generation facilities, and supply of energy resources.

DOE b(1)

Deleted



2. Stakeholder Engagement

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication in the event of a crisis. The Plan provides guidance, *inter alia*, for the following national authorities:

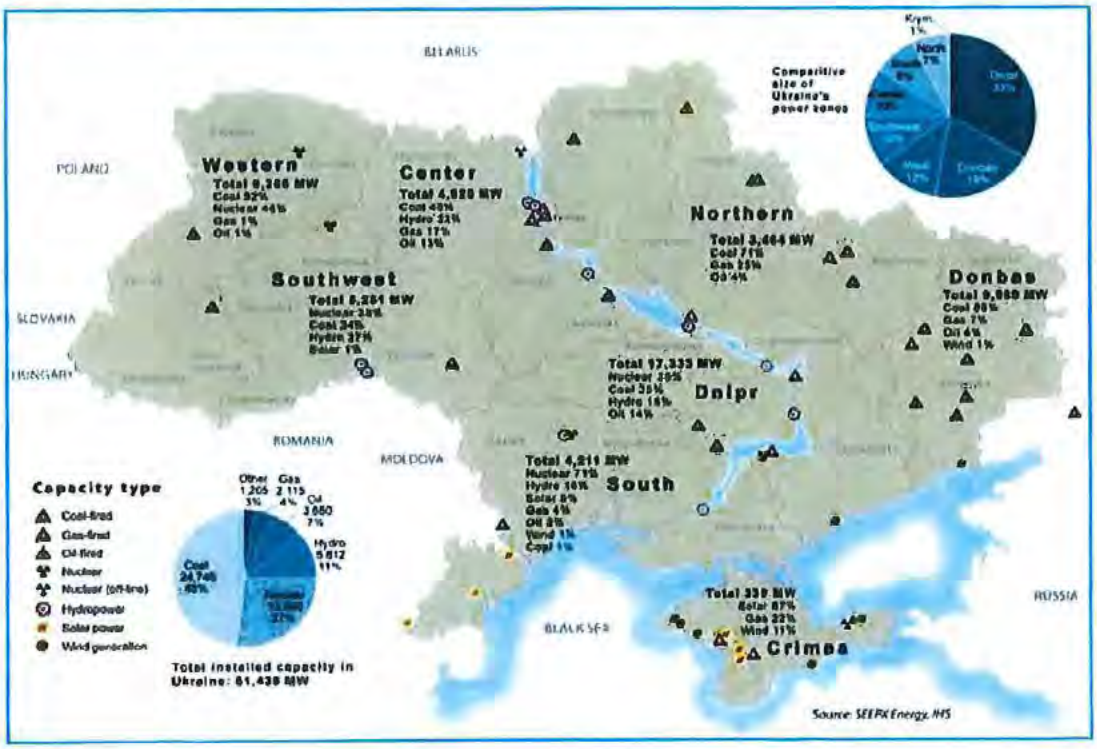
- Ministry of Energy and Coal Industry
- Ministry of Regional Development, Building and Housing

AMERICAN OVERSIGHT

DOE-19-1271-O-001297

- Ministry of Internal Affairs
- Ministry of Infrastructure
- Ministry of Defense
- Ministry of Health
- Ministry of Social Policy
- National Electricity Regulatory Commission
- State Nuclear Regulatory Inspectorate
- State Emergency Service
- Naftogaz
- Ukrenergo
- Energoatom
- State Energy Efficiency and Conservation Agencies
- State Highway Agency
- State Special Communication and Data Protection Service
- Local self-government authorities

3. Electricity Generation



Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of

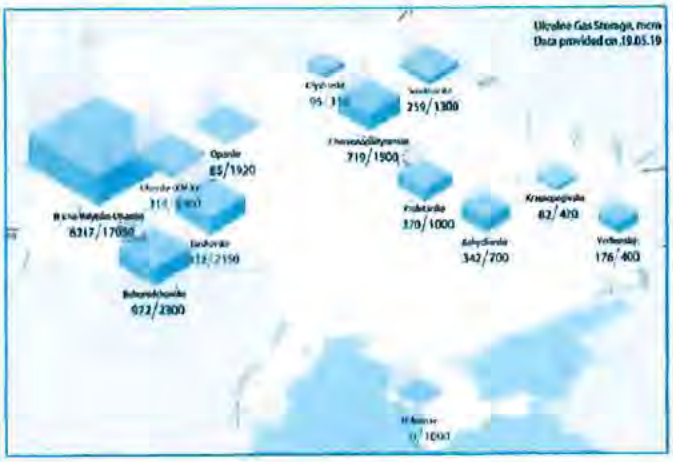
AMERICAN OVERSIGHT

DOE-19-1271-O-001298

0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.

The Plan's electric generation recommendations section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial electricity users have a sufficient supply for the 2019-2020 heating season. This includes increasing coal influx, reducing electric power consumption, increasing imports and reducing exports of electricity, and opening congested transmission pathways by completing interconnection lines (e.g. high voltage lines (HVL) to shift energy from Rivne to the Kyiv substation). Preparedness measures for emergencies in heat and power engineering sector include:

Natural Gas



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz should maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

4. Coal

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase coal production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

A-type coal *(assuming a baseline supply of 300 kTons/month)*:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE-19-1271-O-001299

DOE b(1)

Deleted

5. District Heating

District heating provides a measure to provide space heating and water heating to the majority of Ukrainian residences. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes. A crisis triggers additional actions:



DOE b(1)

Deleted

6. Crisis Response

Stakeholders at the national, regional and local levels should prepare for emergency response scenarios in the event of a crisis. Scenarios where a major system accident becomes possible include when the Unified Energy Systems of Russia and Belarus are operated separately, or when there's a major shortage of generation capacity and the Unified Energy System (UES) of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus. On exceeding the maximum allowed power exchange, stability of the UES of Ukraine may be breached at connections with Russia and Belarus, and UES of Ukraine may be automatically separated by

AMERICAN OVERSIGHT

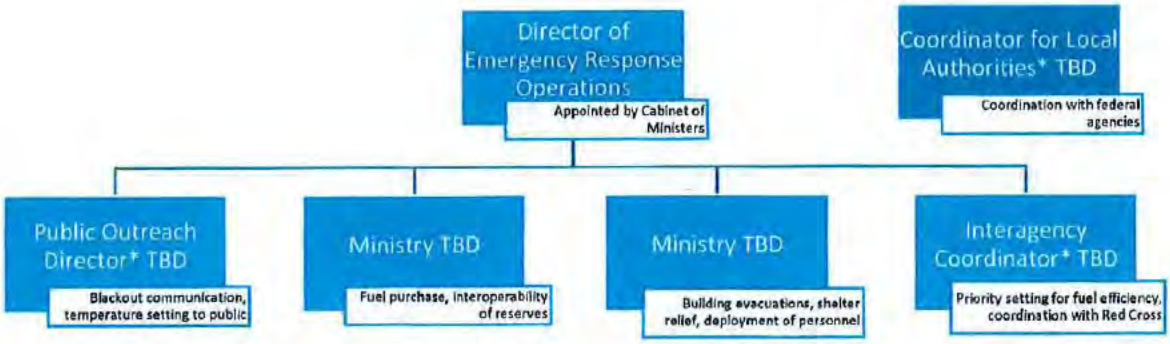
DOE-19-1271-O-001300

actuating devices counteracting asynchronous operation under generation capacity shortage.

DOE b(1)

Deleted

Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



AMERICAN OVERSIGHT

PREPAREDNESS

AMERICAN OVERSIGHT

DOE-19-1271-O-001302

Page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-001303

STAKEHOLDERS

1. Overview

Stakeholder engagement and coordination represents a key to success. Streamlined decision making in the event of a crisis greatly reduces response times and danger of gridlock. Tabletop exercises among stakeholders to define roles and responsibilities for executing the Plan can help identify key gaps and lines of communication and help energy sector decision in the event of a crisis. Major tasks for all-level operating and dispatch personnel in the event of a major system accident should be put into place supported by training and tabletop exercises.



2. Ministry of Energy and Coal Industry

The Ministry of Energy and Coal Industry of Ukraine is the primary central government agency responsible for electricity sectors policies; the civil-nuclear complex, oil and gas sector; and coal industry. The ministry operates under the authority of the Cabinet of Ministers.

3. Ministry of Regional Development, Building and Housing

The Ministry for Regional Development, Building and Housing of Ukraine is responsible for housing infrastructure development and the formation and implementation of state policy in order to create a comfortable, high quality and safe living space for human development. The ministry advances energy planning and implementation efforts by increasing the competitiveness of regions (energy investment and reform) and promoting energy efficiency in the housing and utilities sector.

4. Ministry of Internal Affairs

The Ministry of Internal Affairs executes state policy for the protection of rights and liberties of citizens, investigates unlawful acts against the interest of society and state, fights crime, provides civil order, ensures civil security, and regulates traffic safety. The Ministry also protects energy infrastructure.

AMERICAN OVERSIGHT

DOE-19-1271-O-001304

5. Ministry of Infrastructure

The Ministry of Infrastructure formulates and implements state policy in the fields of air, road, rail, sea, river and urban electric transport, as well as on issues related to the use of subway systems, roads, transportation safety, merchant shipping and navigational/hydrographic support for vessels. The Ministry has programs for improving energy efficiency in the transportation and communications sectors.

6. Ministry of Defense

The Ministry of Defense is responsible for preventing hostility, structuring the military, and repelling all types of aggression (both in country and internationally). The Ministry has been integrating energy efficiency into its military programs across the country. Under the new Cyber Security Strategy, the Ministry will be responsible for implementing cybersecurity protection, as cyberattacks against energy infrastructure is common.

7. Ministry of Health

The Ministry of Health is the main healthcare body of the central government, responsible for managing the universal healthcare system and implementing state policy in the fields of medicine and healthcare. The Ministry has an interest in reducing illness linked to pollution and nuclear safety.

8. Ministry of Social Policy

The Ministry of Social Policy is responsible for regulating labor relations, family and children, immigration and trafficking, women's rights, children's rights, and humanitarian aid. The Ministry is also involved in an inter-agency working group for assessing and managing regulatory reforms for energy performance contracts and supporting activities.

9. National Electricity Regulatory Commission (NERC)

The NERC is involved in the formation and enforcement of a unified state policy towards electricity markets, natural gas, petroleum and petroleum products in the areas of heating, centralized water supply and drainage, treatment and disposal of household waste. The NERC is responsible for the licensing of economic activities in the fields of electricity, heating, centralized water supply and drainage in the oil and gas sector. The NERC sets the prices (tariffs) for electricity, for the supply of natural gas and gas (methane) of coal deposits, and other tariffs.

10. State Nuclear Regulatory Inspectorate (SNRI)

SNRI is the central government executive authority responsible for formation and implementation of state policy in the field of nuclear and radiation safety. The SNRI sets criteria, requirements and conditions of safety in nuclear energy use (normative documents, standards), issues permits and licenses to carry out activities in this area (licensing), and exercises the state supervision for observance of legislation, norms, rules and standards of nuclear and radiation safety (supervision).

AMERICAN OVERSIGHT

11. State Emergency Service (SES)

The SES implements state policies in the domain of civil protection, protection of population and territories from emergencies, prevention of emergencies, rectification of emergency consequences, rescue work, fire extinguishing, fire and technogenic safety, accident rescue service activities and hydrometeorologic activities. The former Ministry was created from the consequences of the Chernobyl catastrophe. The SES is a central body of executive power with activities directed and coordinated by the Cabinet of Ministers through the Ministry of Internal Affairs.

12. Naftogaz

Naftogaz is the national oil and gas company of Ukraine; it is a state-owned company. The company is involved with extraction, transportation, and refinement of natural gas and crude oil. Naftogaz operates under the Ministry of Energy and Coal Mining.

13. Ukrenergo

UKRENERGO is a national power company responsible for operational and technological control of the Integrated Power System (IPS) of Ukraine and electricity transmission via trunk power grids from generating plants to the distribution networks of the regional electricity suppliers (*oblenergos*). UKRENERGO is a state enterprise that covers the entire territory of Ukraine.

14. Energoatom

The National Nuclear Energy Generating Company of Ukraine (Energoatom) is a state enterprise operating all four active nuclear power stations in Ukraine. Energoatom operates under the Ministry of Fuel and Energy.

15. State Agency on Energy Efficiency and Energy Saving of Ukraine (SAEE)

The SAEE is a central executive authority governed and coordinated by the Cabinet of Ministers of Ukraine and is responsible for developing and implementing energy efficiency and renewable energy government policy.

16. State Highway Agency

Transport of fuel fossils (i.e. oil and gas) is under the Ministry on Energy and Fuel, while most of security responsibility matters are supervised by Ministry of Interior or other state agencies. The Ministry of Infrastructure only implements government policies related to the transport and communication sectors as well as security related to transport.

17. State Service of Special Communications and Information Protection

The State Service of Special Communications and Information Protection of Ukraine is responsible for protecting state information within data networks, safeguarding the critical

AMERICAN OVERSIGHT

DOE-19-1271-O-001306

information infrastructure, technical security, and intelligence services for the Administration.

18. Local self-government authorities

There are 24 regions in Ukraine and each one is divided into districts. The President of Ukraine and his Cabinet of Ministers appoint the heads of local governments. The city councils are tasked with disaster relief efforts and safety programs that protect population groups from natural disasters.

AMERICAN OVERSIGHT

DOE-19-1271-O-001307

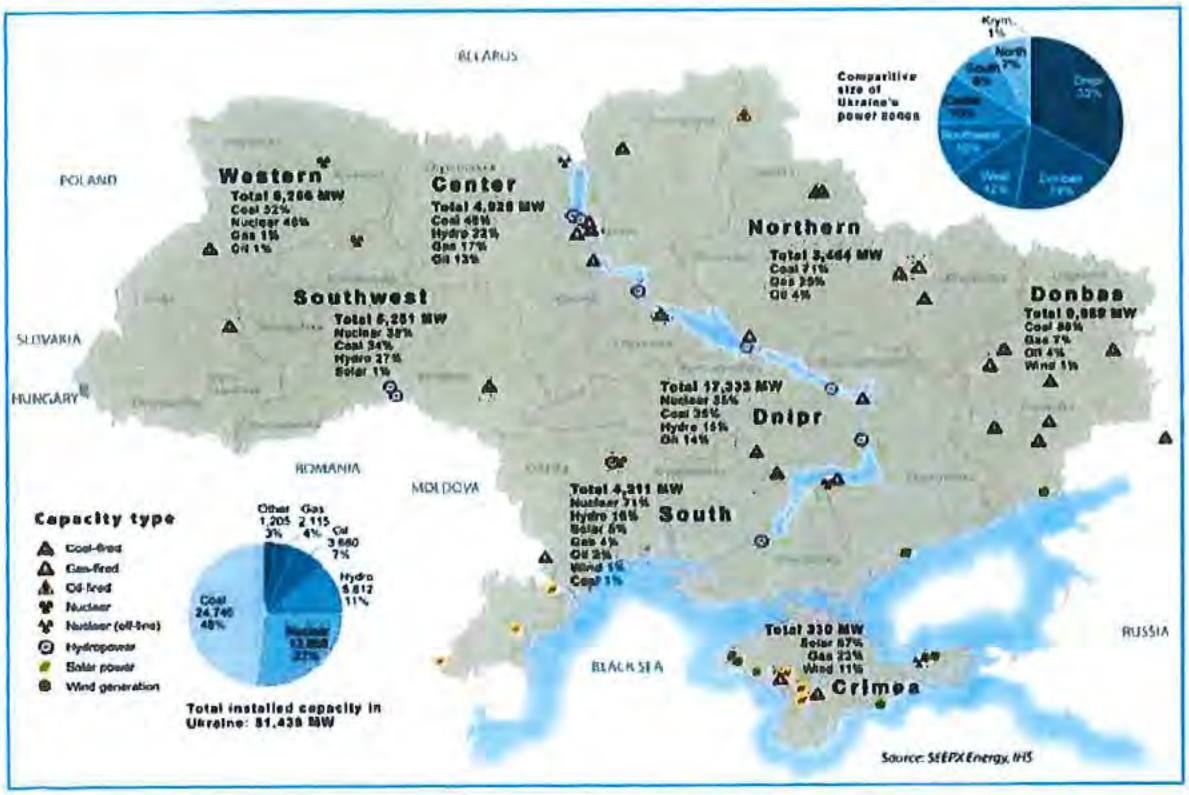
AMERICAN OVERSIGHT

DOE-19-1271-O-001308

POWER SECTOR

1. Overview

Ukraine's electric energy sector relies primarily on thermal power plants (TPP), combined heat and power plants (CHP), hydroelectric power plants (HPP), pumped storage power plants (PSP), and nuclear power plants (NPP). The system (excluding the Crimean energy system) generates approximately 55 gigawatt (GW) from fourteen thermal power plants, four nuclear power plants, seven hydroelectric power plants, three pumped storage power plants, and 94 combined heat and power systems. Approximately 23,000 km of main and interstate transmission lines of 35-800 kV voltage, and 996,000 km distribution lines of 0.4-150 kV voltage serve as the national transmission system with limited interconnection across regions.



2. Threats to the Power Sector

The following constitute the primary threats to steady-state operation of Ukraine's electricity sector:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

NATURAL GAS

1. Overview

This section outlines a series of measures to ensure that Ukraine's residential, industrial and commercial oil and natural gas users have sufficient supply for the 2019-2020 heating season. This includes measures to minimize threats to the oil and gas sector, maximizing domestic natural gas production, and expanding the natural gas reverse flow capacity from the European Union (EU).



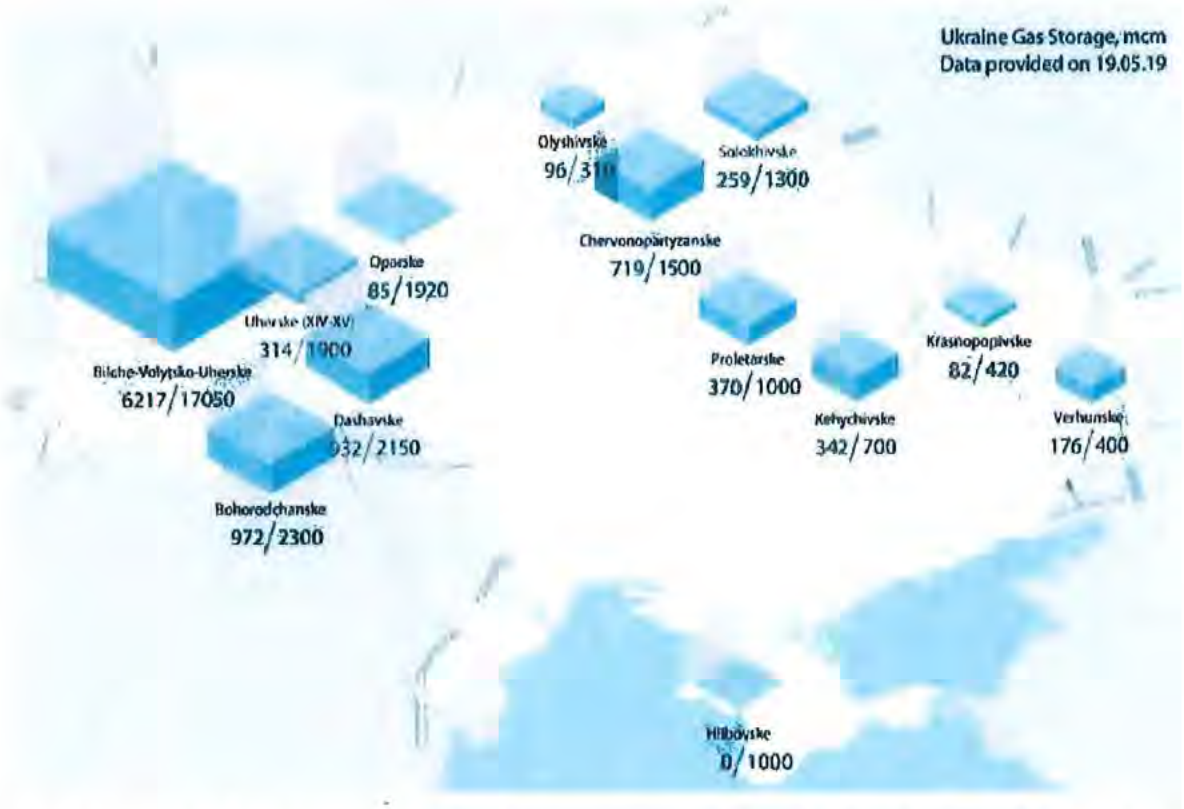
2. Zero-Transit Scenario

Ukraine is actively preparing for the possibility of a cut-off of Russian natural gas transit to Europe and Turkey via the Ukrainian Gas Transit System (GTS) this winter. Since 2014, Gazprom has used Ukraine's GTS to ship between 60-90 billion cubic meters of gas per year (bcma) to Europe and Turkey (equivalent to 12-18 percent of European Union gas demand). Western European energy markets may be able to withstand a prolonged cutoff with purchases of liquefied natural gas (LNG). This is not the case for a number of relatively unintegrated countries in Central and Southeastern Europe (notably Bulgaria and Moldova) dependent on Russia as a dominant—and many times sole—supplier. The most vulnerable country could be Ukraine itself. If Ukraine has not preemptively imported and stored adequate volumes of gas and Gazprom cuts off gas shipments to Europe via Ukraine, the country could face a serious energy crises. Key points include:

AMERICAN OVERSIGHT

- A prolonged disruption of Russian natural gas supplies will put stress on European gas markets and potentially limit Ukraine's ability to contract for West-East supplies.
- Adding additional reverse flow capacity from existing pipeline infrastructure with neighboring countries is technically feasible by reconfiguring compression stations.
- Creative options such as virtual reverse flows and contracting with other countries to book capacity within Ukraine's large gas storage system present more ways to build resilience.
- A coordinated push to find financing opportunities from international financial institutions or the Eurobond market to allow Naftogaz or independent traders to purchase gas supplies to build storage will be key.

3. Storage



Ensuring Ukraine's replenishment of underground storage reservoirs by the start of the heating season on October 15, 2019 represents a core priority area for this planning effort. Ukraine will require 19-21 bcm of storage supplies to mitigate the impact of a prolonged disruption of transit supplies, 3 bcm more than average due to system compression requirements in a zero transit scenario. As of May 19, according to Naftogaz statistics, Ukraine held 10.56 bcm in storage. Naftogaz wants to maximize Ukraine's import capacity and storage injections as soon as possible but lacks funding to purchase gas. Natural gas prices may rise significantly in the fall 2019 if European consumers become concerned about a possible gas cutoff. Adequate volumes may also be unavailable since other European consumers may use the opportunity to fill their own storage

AMERICAN OVERSIGHT

DOE-19-1271-O-001312

facilities. At $140-180/mcm, Naftogaz will also need to borrow over $1 billion to make these purchases.

As Ukraine is currently using only about a third of its reverse flow capacity from the EU, the biggest obstacle in increasing natural gas storage injection levels to at least 60 MMcm/d is financial, not technical. Inadequate finances are also an obstacle to the option of Ukraine restoring gas supplies from Russia's Gazprom. Naftogaz needs to secure adequate credit in order to increase natural gas purchases and is encouraged to pursue all avenues to do so.

The Government of Ukraine should consider direct financing from the state budget to cover the shortfall in natural gas storage. Furthermore, Naftogaz needs to call for the reinstatement of natural gas curtailment measures. Curtailing domestic natural gas consumption will free up additional volumes of domestic production to be injected into underground storage.

4. Opening Greater Reverse Flow Capacity

Ukraine currently consumes approximately 30 bcm of natural gas per year. Domestic production meets two-thirds of this demand. A reverse flow-pipeline from Slovakia that returns the Russian gas to Ukraine once it crosses into the European Union supplies the remaining 10 bcm. Ukraine, the most energy intensive economy in Europe, uses most of the gas for household consumption and communal heating systems, as well as heavy industry. State-owned natural gas company Naftogaz is currently planning for a zero-transit scenario following the expiration of their long-term transit contract with Russia's Gazprom on December 31, 2019. This includes the need to not only expand routes from neighboring countries but also build sufficient storage supplies to maintain enough compression within the system for West-East flows. Ukraine's options include:

- **Slovakia:** Slovakia's system is the most capable of delivering additional supplies to Ukraine. Ukraine transit supplies enter the EU at the Veľké Kapušany compressor station in Eastern Slovakia. The station's total power of nearly 300 MW—the largest compressor station in Europe—allows technical entry flow of approximately 70 bcm per year. Most of these supplies transit onward to the Central European Gas Hub in Baumgarten. Of these transit supplies, an average of 8 bcm per year reverse flow back into Ukraine through the Bundice border point via the Vojany-Uzhorod pipeline. Absent East-West transit supplies, Slovakia's capacity would technically be free for sizeable flows of European gas to Ukraine. However, many EU Member States may themselves struggle to meet gas demand in the event of a prolonged cut-off. Moreover, Eustream believes that reversing the four lines at Veľké Kapušany would violate the agreement under which Gazprom has booked most of the capacity of the lines entering from Ukraine until 2028.

- **Poland:** Poland's current capacity to deliver reverse flow natural gas supplies to Ukraine stands at 1.5 bcma via the Drozdowice interconnector on the Poland-Ukraine border; the first reversed flows began in April 2014 in the wake of the Ukraine-Russia conflict under a 2012 deal with German utility RWE. The gas transits through Poland's Gaz-System with deliveries based on European wholesale price levels. Increasing the reverse flow capacity to the interconnector's 5 bcm capacity would probably require adding additional reverse compression. Technically, this would likely entail moving a mobile compression turbine from another station. Other discussions such as the Hermanowice interconnector, expanding

AMERICAN OVERSIGHT

DOE-19-1271-O-001313

the Świnoujście LNG terminal and Baltic Pipe present future, medium-term opportunities to expand north-south flows.

- **Hungary:** Three interconnector pipelines cross the Ukraine-Hungary border with one built with a reverse flow mode. The two others are sufficient to provide Hungary's full imports from Russia for domestic consumption, storage, and transit. This provides the potential to reverse flow 7.1 bcm to Ukraine. In the event of a supply shutoff from Russia to Ukraine, Hungary would utilize stored gas and try to find new supplies elsewhere, some via LNG. This will have impacts on Hungary's gas system configuration—as well as available supply—to enter into Ukraine.

- **Romania:** The Trans-Balkan pipeline through Ukraine transports about 20 bcm of natural gas through Romania to Bulgaria, Greece, Macedonia, and Turkey. When and if those shipments are halted, Ukrtransgaz hopes to equip Transit 1 pipeline—one of the three connections that form the Trans-Balkan pipeline—with physical reverse-flow capabilities. The facility could allow up to 5 bcm in additional supplies to be shipped to Ukraine. Romania's current upstream natural gas production could make this an attractive medium-term option if Black Sea gas development goes forward..

- **Virtual reverse flow:** European customers sometimes trade gas through an accounting mechanism known as "virtual reverse flow" whereby less physical gas is delivered downstream and the upstream recipient pays the downstream customer. Virtual reserve flow would permit Naftogaz to decrease physical gas shipments to Slovakia or Poland to divert the gas into Ukrainian gas storage or sell into the mid-stream market. This would not require physical reverse flow capability from the transmission network.

AMERICAN OVERSIGHT

Scenario No. 1: With gas supplies from Gazprom for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3187.8	102.8	4726.1	157.5	5796.9	187.0	13710.8	149.0	5833.5	188.2	4842.0	172.9	3805.0	122.7	14480.5	160.9	28191.3	154.9
Import	892.2	28.8	946.3	31.5	1517.0	48.9	3355.5	36.5	1991.8	64.3	2125.5	75.9	1653.7	53.3	5771.0	64.1	9126.5	50.1
including Gazprom PJSC	0.0	0.0	0.0	0.0	518.2	16.7	518.2	5.6	924.6	29.8	927.9	33.1	304.4	9.8	2156.9	24.0	2675.1	14.7
from Europe	892.2	28.8	946.3	31.5	998.8	32.2	2837.3	30.8	1067.3	34.4	1197.6	42.8	1349.3	43.5	3614.2	40.2	6451.5	35.4
Domestic production	1679.9	54.2	1650.3	55.0	1726.4	55.7	5056.6	55.0	1692.4	54.6	1532.3	54.7	1689.3	54.5	4914.0	54.6	9970.6	54.8
Offtake from	615.7	19.9	2129.5	71.0	2553.5	82.4	5298.7	57.6	2149.3	69.3	1184.2	42.3	462.0	14.9	3795.5	42.2	9094.2	50.0
UGSF[a] injection into UGSF	112.9	3.6	0.0	0.0	0.0	0.0	112.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	112.9	0.6
Ukraine, total	3080.0	99.4	4717.8	157.3	5794.4	186.9	13592.2	147.7	5779.1	186.4	4773.8	170.5	3821.5	123.3	14374.4	159.7	27966.6	153.7
including																		
Consumers	2904.2	93.7	4539.8	151.3	5570.3	179.7	13014.3	141.5	5537.3	178.6	4556.8	162.7	3661.2	118.1	13755.3	152.8	26769.6	147.1
including Ministry of	513.6	16.6	560.6	18.7	655.2	21.1	1729.4	18.8	678.0	21.9	591.2	21.1	609.1	19.6	1878.3	20.9	3607.7	19.8
Industry - metallurgy	254.2	8.2	278.6	9.3	319.9	10.3	852.7	9.3	321.6	10.4	269.5	9.6	261.2	8.4	852.3	9.5	1705.0	9.4
- chemistry	259.4	8.4	282.0	9.4	335.3	10.8	876.7	9.5	356.5	11.5	321.7	11.5	348.0	11.2	1026.2	11.4	1902.9	10.5
including RSA funds	1601.8	51.7	3024.3	100.8	3922.2	126.5	8548.3	92.9	3965.2	127.9	3339.1	119.3	2691.5	86.8	9995.8	111.1	18544.1	101.9
- population	1131.6	36.5	1806.0	60.2	2299.5	74.2	5237.1	56.9	2385.3	76.9	1975.5	70.6	1526.4	49.2	5887.2	65.4	11124.3	61.1
- heat energy	389.6	12.6	1088.5	36.3	1426.3	46.0	2904.4	31.6	1437.8	46.4	1222.5	43.7	949.2	30.6	3609.5	40.1	6513.9	35.8
OTE	175.8	5.7	178.0	5.9	224.1	7.2	577.9	6.3	241.8	7.8	217.0	7.8	160.3	5.2	619.1	6.9	1197.0	6.6

AMERICAN OVERSIGHT

Scenario No 2: Without gas supply from Gazprom
Calculated Ukrainian balance for the period of October 2019 - March 2020 (maximum offtake)

	October 2019		November 2019		December 2019		IV quarter 2019		January 2020		February 2020		March 2020		I quarter 2020		Total	
	total	a day	total	a day	total	a day	total	a day	total	a day	Total	a day	total	a day	total	a day	total	a day
Gas reserves	3229,9	104,2	4717,8	157,3	5794,4	186,9	13742,1	149,4	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	28116,5	154,5
including																		
Import, including	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
"Gazprom" PJSC	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
from Europe	1050,0	33,9	1791,5	59,7	882,0	28,5	3723,5	40,5	153,7	5,0	268,5	9,6	0,0	0,0	422,2	4,7	4145,7	22,8
Domestic production	1679,9	54,2	1650,3	55,0	1726,4	55,7	5056,6	55,0	1692,4	54,6	1532,3	54,7	1689,3	54,5	4914,0	54,6	9970,6	54,8
Offtake from UGSF	500,0	16,1	1276,0	42,5	3186,0	102,8	4962,0	53,9	9933,0	126,9	2973,0	106,2	2132,2	68,8	9038,2	100,4	14000,2	76,9
Injection into UGSF	149,9	4,8	0,0	0,0	0,0	0,0	149,9	1,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	149,9	0,8
Ukraine, total	3080,0	99,4	4717,8	157,3	5794,4	186,9	13592,2	147,7	5779,1	186,4	4773,8	170,5	3821,5	123,3	14374,4	159,7	27966,6	153,7
including																		
Consumers	2904,2	93,7	4539,8	151,3	5570,3	179,7	13014,3	141,5	5537,3	178,6	4556,8	162,7	3661,2	118,1	13755,3	152,8	26769,6	147,1
including RSA funds	1601,8	51,7	3024,3	100,8	3922,2	126,5	8548,3	92,9	3965,2	127,9	3339,1	119,3	2691,5	86,8	9995,8	111,1	18544,1	101,9
OTE	175,8	5,7	178,0	5,9	224,1	7,2	577,9	6,3	241,8	7,8	217,0	7,8	160,3	5,2	619,1	6,9	1197,0	6,6

* In "consumers" category the volumes of gas consumption in ATO zone has not been included. It amounts to around 450 mln. c.m. per month (15-20 mln.c.m. per day) ** Consumption is calculation based on the assumption of mildly cold winter.
*** Values for gas offtake from UGSF were accepted on the maximum process level, including remains during offtake period. It amounts to 19 bln. c.m., including 4.8 bln.c.m. for process stock reserve

AMERICAN OVERSIGHT

Coal

1. Overview

While nuclear power plants are used for baseload power in Ukraine, coal-fired power plants operate in intermediate and peaking modes. Therefore, coal-fired units are most essential during the high power-consumption periods of winter and summer. Having adequate fuel supplies on hand during these seasons (especially winter) is of crucial importance in terms of maintaining reliable electricity supply. The following section presents recommendations that address these factors.

2. Coal Market

Coal from non-government controlled Donbas, which previously provided all anthracite and a significant part of gas coal (G-coal), is no longer available. Ukraine is converting some plants to burn G-coal rather than anthracite, significantly reducing Ukraine's reliance on anthracite. More than 80 percent of coal is produced by private company DTEK, which operates the most productive mines. The remaining state-owned mines have been united in the new National Coal Company. The main buyers of thermal coal are the private company DTEK and state-owned Centrenergo. Because of the method NKREKP uses to regulate electricity tariffs, coal prices in Ukraine are the highest in Europe. Ukraine is highly dependent on coal resources and it needs a more transparent system for maintaining and pricing supplies.

3. Reliance on Anthracite

Russian anthracite appears to be the Achilles heel of Ukraine's coal supply. Although some coal-fired power plant units have already converted from burning anthracite to burning bituminous coal and more are planned, a number of power plant units still burn anthracite. Ukraine is forced to import roughly one fourth of the coal it consumes, approximately 80 percent of which is anthracite imported from Russia. If that supply is disrupted during severe winter cold or summer heat or when one of Ukraine's nuclear power plants goes offline, then Ukraine's electric supply could be negatively affected. The world markets for coal are dominated by bituminous and subbituminous coals, so the reliance on Russian anthracite necessarily constrains Ukraine's alternative fuel supply options.

4. Ensuring Sufficient Supplies

Ensuring access to coal and heavy fuel oil represents a key part of the Plan. Ukraine needs to increase production and imports, and to reduce electricity consumption and export if it is to have sufficient resources for the heating season. A conservative approach would be to prepare for a colder winter (-20°C) since several of the current influxes of coal are not certain to be maintained through the heating season. For the upcoming winter season, the Plan recommends securing the following amounts of coal to ensure an adequate supply of stocks exist to get through the heating season ending:

Deleted	DOE b(1)

AMERICAN OVERSIGHT

DOE-19-1271-O-001317

DOE b(1)

Deleted

5. **Railway and port infrastructure for Coal transloading and transportation to National Thermal Power Plants**

Planning Factor	Capacity
Thermal Power Plants (TPP) and Coal Consumption	Deleted
Freight rail cars (of all types)	
Transportation of coal by rail	
Transportation of coal by sea through the Odessa region sea ports (includes Illichivsk, Pivdenny, TIC)	
Transportation of coal through all ports	

DOE b(1)

AMERICAN OVERSIGHT

DOE-19-1271-O-001318

District Heating

1. Overview

District heating plays an important role in Ukraine serving almost 60 percent of the population with over 25 million customers (Eurostat). Municipalities and communal users account for over 40 percent of heat energy usage. Natural gas serves as the dominant fuel. The Plan envision a temperature trigger for district heating systems at 16°C accompanied by public service broadcasts (e.g. billboards and posters, TV commercials, radio, press and text messages for mobile phones, messages through electronic payment systems and heating utility bills) about the importance of reducing heating fuel use and urge avoiding the use of electric heaters as substitutes.

2. Threats to Combined Heat and Power (CHP) System

For household heating the main threats to ensuring the established operating conditions for heat sources (boiler houses and CHP), which supply thermal energy to public institutions and to communities in Ukraine, and the reliable and safe operation of the heating energy sector production, transmission and delivery entities (heating and hot water supply) are:

DOE b(1)

- Fuel shortfall (decrease of operational fuel stockpiles at boiler houses and CHP below levels Deleted);
- Insufficient gas delivery volumes or gas pressure decrease in the main and distribution gas networks to the heating sector enterprises;
- Complete cessation or emergency cut-off of the gas supply to the heating sector enterprises;
- Cessation of power supply and water supply to the heating energy sector enterprises as a consequence of an emergency in the electric energy sector.

3. Response Measures to Remove Threats to Communal Heating Enterprises

The heat equipment of communal heating enterprises, according to the applicable Ukrainian legislation, falls into high-risk facilities category, and, consequently, has emergency response plans for all facilities (broken down by the categories of a boiler house, heating network area and central heat distribution station) approved according to a procedure established by legislation. There is an emergency stock of necessary materials and spare parts.

Emergency response exercises help personnel understand procedures and respond in a prompt manner during crisis events. In every specific situation, preparedness allows for a calculation analysis to identify the stability of heating networks and of building heating systems. This calculation then triggers a sequence of actions to prevent negative effects of a potential blackout.

4. Preparedness Measures for Emergencies in the Heat and Power Engineering Sector

AMERICAN OVERSIGHT

DOE-19-1271-O-001319

The following measures should be taken in order to prevent possible threats to the heat and power energy sector:

- Ensure fulfillment of proposals regarding purchase of fuel (coal and mazut) and establish policies to implement a more transparent and cost reflective tariff setting process.
- A check of actual conditions and operability using backup fuel (in the case of natural gas as primary fuel and heavy oil as reserve fuel), etc.
- Ensure heavy oil purchase in the volumes required for a sustainable fall-winter period.
- Ensure the availability of backup sources of power and water supply.
- The implementation of energy conservation measures for all types of properties for the fall-winter period.
- Consideration of the possibility of shifting vacation periods at all education institutions and prolongation of vacations. Development of a mechanism for implementation of new terms and duration, if necessary.
- Development of prioritization lists of consumers' groups in the event of the possible shutoff of the heating system.
- The development of messaging by the Ministry of Regional Development and Construction to limit consumption of heating and distribution using billboards and posters; TV commercials, radio, press and text messages for mobile phones; electronic payment systems, heating utility bills; and letters by the Ministry of Regional Development and Construction to industrial enterprises indicating the reasons for limitations in heating consumption and recommending measures to be taken;
- Extension of the term of hot water supply shutoff for the population and public institutions.

5. Fuel switching to Mazut

DOE b(1)

The estimated consumption of natural gas at TPPs and CHPs during fall-winter 2019-20 amounts Deleted. Taking into account the technical and process capacity on TPPs of generating companies and CHPs (current mazut equipment stock is in satisfactory technical condition or in out of use state and can start its operation after routine maintenance, proper condition of access roads or mazut pipelines) the following are suggested:

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

DOE b(1)

Transportation of heavy oil by rail	Deleted

6. Planning

A prolonged cut-off in natural gas supplies during the winter heating season carries the potential to trigger a crisis for household heating, particularly in the event of below-average temperatures. Preparedness entails establishing a system of public outreach to ensure reduction in consumption by both households and industry. The following actions should be taken for district heating systems in the event of a cut-off in natural gas supplies:



DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001322

RESPONSE

AMERICAN OVERSIGHT

DOE-19-1271-O-001323

Page intentionally left blank.

AMERICAN OVERSIGHT

DOE-19-1271-O-001324

EMERGENCY RESPONSE

1. Overview

This section details Ukraine's emergency response procedure in the event of a major system accident. A major system accident is an accident leading to power loss at a greater part of Ukraine's territory and loss of own needs generation at combined heat power and nuclear power plants followed Deleted A major system accident may be preceded with:

DOE b(1)

- Gradual increase in generation capacity shortage;
- Sudden loss of major generation capacity;
- Emergency shut-down of several system-forming transmission lines of the main grid.

Scenarios where a major system accident become possible include conditions where the Unified Energy Systems of Russia and Belarus are operated separately, or when there is a major shortage of generation capacity and the Unified Energy System of Ukraine is disconnected from the Unified Energy Systems of Russia and Belarus.

2. Major Tasks for All-level Operating and Dispatch Personnel

Major tasks for all-level operating and dispatch personnel in the event of a major system accident include:

DOE b(1)

1. Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001325

DOE b(1)

Deleted

3. Prevention of accident evolving into a special system wide collapse

Personnel should undertake the following procedures in the case of separate operation of the UES of Ukraine from the Unified Energy Systems of Russia and Belarus consistent with

DOE b(1)

Deleted

3. Recovery after a special (extreme) system wide collapse and restoration of a greater part of the Unified Energy System of Ukraine «from 0».

AMERICAN OVERSIGHT

DOE-19-1271-O-001326

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001327

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001328

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted



AMERICAN OVERSIGHT

DOE-19-1271-O-001330

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001331

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

From: Tumminia, Paul
To: Wondra, Nicholas M.
Cc: Noel, Emily E
Subject: RE: Ukraine Docs
Date: Friday, August 30, 2019 11:57:00 AM
Attachments: Ukrainian National Energy Contingency Plan - Final 10-12-14.pdf

Nic: 2014 plan..

-----Original Message-----
From: Wondra, Nicholas M.
Sent: Friday, August 30, 2019 11:24 AM
To: Tumminia, Paul <paul.tumminia@hq.doe.gov>
Cc: Noel, Emily E <emily.noel@hq.doe.gov>
Subject: Ukraine Docs

Paul, thanks for including me this morning on the various calls. All were informative.

When you can, just a reminder to pass the following to me if you could:
-2014-2015 Contingency Plan
-201-16 (?) Winter action plan document
-scope of work for the PNNL project we discussed
-Danylyuk (or staff's) email

Thanks & best regards, Nic

Nicholas "Nic" Wondra
Office of the Under Secretary for Nuclear Security
National Nuclear Security Administration
Office: 202/586-3641
Front Office: 202/586-5555
NIPR: Nicholas.Wondra@nnsa.doe.gov
SIPR: (b) (6)
NESAN: (b) (6)

~~Attachment contains CONFIDENTIAL~~
~~When separated from attachment,~~
~~this page is UNCLASSIFIED~~

AMERICAN OVERSIGHT

Deleted

Derivative Declassifier review required prior to declassification

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE

Classified by: Matt B. Moury, AU-1, DOE
Reason: 1.4(b)(d)
Declassify on: 20450622

FOR OFFICIAL USE ONLY

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001352

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001354

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001356

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001357

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001359

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001360

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001361

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001362

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001365

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001366

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001367

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001368

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001369

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001370

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001371

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001372

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001374

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001376

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001377

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001378

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001379

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001380

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001381

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001382

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001383

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001385

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001388

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001389

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001392

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001393

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001394

DOE
b(1)

Annex 1

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 2

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 3

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 4

Deleted

AMERICAN OVERSIGHT

Annex 5

DOE b(1)

Deleted

AMERICAN OVERSIGHT

Annex 6

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

AMERICAN OVERSIGHT

Annex 8

DOE b(1)

Deleted

AMERICAN OVERSIGHT

Annex 9

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Annex 10

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 11

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE-19-1271-O-001417

DOE
b(1)

Annex 12

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 13

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Annex 14

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 15

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 16

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Appendix 17

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Appendix 18

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 19

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Annex 20

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Annex 21

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Annex 22

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 23

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

Annex 24

DOE b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Annex 25

DOE b(1)

Deleted

AMERICAN OVERSIGHT

Annex 25

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

Annex 27

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 28

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 29

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

5

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE b(1)

Annex 30

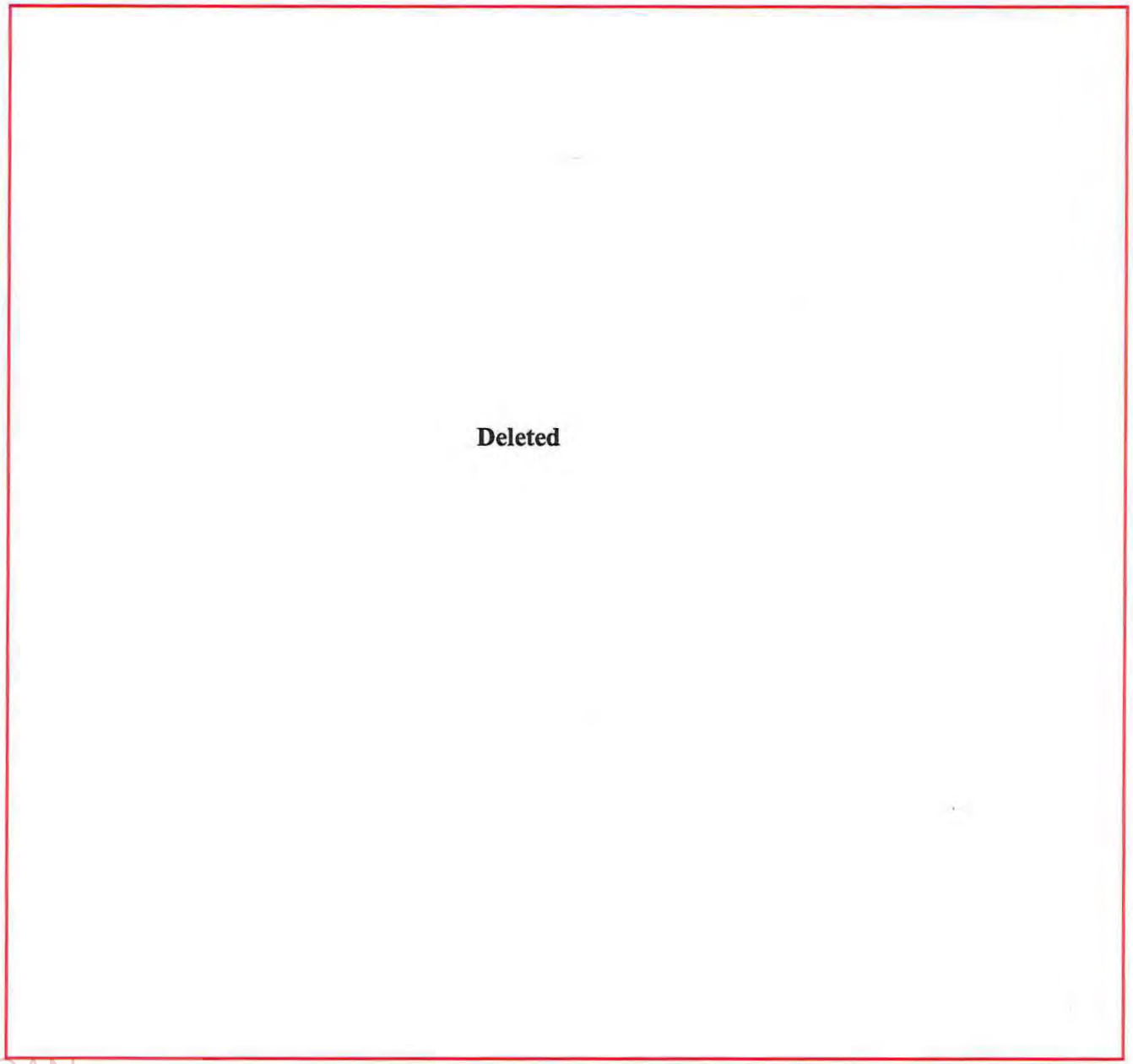
Deleted

AMERICAN OVERSIGHT

Deleted

DOE b(1)

AMERICAN OVERSIGHT



DOE
b(1)

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN
OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 32

Deleted

AMERICAN OVERSIGHT

DOE b(1)

Annex 33

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 34

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Deleted

AMERICAN OVERSIGHT

DOE
b(1)

Annex 35

Deleted

AMERICAN OVERSIGHT

DOE
b(1)



AMERICAN OVERSIGHT

From: Tumminia, Paul
To: Greenberg, Raymond F Jr; Lyon, Jennifer; Lockerbie, Summer
Cc: Reichhardt, Mark; DL-NA-20 DNN Action Officers; Sandoli, Robert
Subject: RE: trip objectives for Germany
Date: Friday, January 25, 2019 3:11:00 PM
Attachments: U.S.-Ukraine Strategic Dialogue Proposal Summary.docx

---

Ray:
I believe that the concept was sent around for department wide review and comment. This sets the framework for the SED.
S2 would meet with the Minister of Foreign Affairs, who has been named as counterpart for this.
I will be working on the memo and a draft action plan next week. Thanks! -p

From: Greenberg, Raymond F Jr
Sent: Friday, January 25, 2019 3:09 PM
To: Lyon, Jennifer <Jennifer.Lyon@Hq.Doe.Gov>; Lockerbie, Summer <Summer.Lockerbie@NNSA.DOE.Gov>
Cc: Reichhardt, Mark <Mark.Reichhardt@hq.doe.gov>; DL-NA-20 DNN Action Officers <DL-NA-20DNNActionOfficers@NNSA.doe.gov>; Tumminia, Paul <Paul.Tumminia@Hq.Doe.Gov>; Sandoli, Robert <robert.sandoli@hq.doe.gov>
Subject: RE: trip objectives for Germany

Well, I don't want to spoil all his bilat fun on a Saturday afternoon.

I will send out the call for input so we can plug our stuff into the Germany bilat quickly.

I think we should be able to pull Ukraine together fairly quickly so I'll give our offices a heads-up. Is there any info on who S2 will meeting for the US-Ukraine SED?

From: Lyon, Jennifer
Sent: Friday, January 25, 2019 2:54 PM
To: Greenberg, Raymond F Jr <Raymond.GreenbergJr@nnsa.doe.gov>; Lockerbie, Summer <Summer.Lockerbie@NNSA.DOE.Gov>
Cc: Reichhardt, Mark <Mark.Reichhardt@hq.doe.gov>; DL-NA-20 DNN Action Officers <DL-NA-20DNNActionOfficers@NNSA.doe.gov>; Tumminia, Paul <Paul.Tumminia@Hq.Doe.Gov>; Sandoli, Robert <robert.sandoli@hq.doe.gov>
Subject: RE: trip objectives for Germany

He didn't choose that one but if you recommend he go to that one we can suggest to his staff.

There will several bilats bwith Germany (minister and Bundestag) and yes we can run those by you. If you have input to send us now please draft and send ASAP and we can send the final draft to you once it is ready- otherwise we can put a placeholder.

Yes in Ukraine as well. Paul will send you the memo to review.

These will be pretty quick turns so appreciate your getting input back to us quickly.

AMERICAN OVERSIGHT

Thanks!

From: Greenberg, Raymond F Jr <Raymond.GreenbergJr@nnsa.doe.gov>
Date: Friday, Jan 25, 2019, 2:50 PM
To: Lyon, Jennifer <Jennifer.Lyon@Hq.Doe.Gov>, Lockerbie, Summer <Summer.Lockerbie@NNSA.DOE.Gov>
Cc: Reichhardt, Mark <Mark.Reichhardt@hq.doe.gov>, DL-NA-20 DNN Action Officers <DL-NA-20DNNActionOfficers@NNSA.doe.gov>
Subject: RE: trip objectives for Germany

Jennifer,

In looking through the list of speakers, the only tie to us is the panel on arms control. However, S2 is not participating in that panel, correct?

As part of the normal process, we (NNSA) should have a chance to review the bilat paper with Germany.

Also, I would think we would be given a chance to see the papers for the US-Ukraine SED?

Ray

-----Original Message-----
From: Lyon, Jennifer
Sent: Friday, January 25, 2019 2:16 PM
To: Greenberg, Raymond F Jr <Raymond.GreenbergJr@nnsa.doe.gov>; Lockerbie, Summer <Summer.Lockerbie@NNSA.DOE.Gov>
Cc: Reichhardt, Mark <Mark.Reichhardt@hq.doe.gov>
Subject: trip objectives for Germany
Importance: High

Ray and Summer:

Sorry to pepper you with so many emails, but we thought you might want to add an objective to this (if you have any for MSC in particular). You may want to do a similar paper for your Vienna day.

If we could have back by early next week if you wish to add anything, we need to move this piece forward pretty quickly.

Thanks!

Jennifer Lyon
Deputy Director
Office of European and Eurasian Affairs
US Department of Energy
Office: 202-586-2579

AMERICAN OVERSIGHT

Doc 83

Deleted

DOE b(1)

CONFIRMED TO BE UNCLASSIFIED
This Sanitized Version Only
DOE OFFICE OF CLASSIFICATION
DATE 2/4/2022

~~Derivative Declassifier review required prior to declassification~~

~~CONFIDENTIAL~~

~~Classified by: Matt B. Moury, AU-1, DOE
Reason: 1.4(b)(d)
Declassify on: 20450622~~

AMERICAN OVERSIGHT
DOE-19-1271-O-001504

Deleted

DOE
b(1)

AMERICAN OVERSIGHT

Deleted

DOE
b(1)

AMERICAN OVERSIGHT

Deleted

DOE
b(1)

AMERICAN OVERSIGHT