CERTIK

Security Assessment

Safe Energy

Aug 19th, 2021

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Summary

This report has been prepared for Safe Energy to discover issues and vulnerabilities in the source code of the Safe Energy project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

Overview

Project Summary

Project Name	Safe Energy
Platform	BSC
Language	Solidity
Codebase	BSC deplyment address: 0xBBe899c61198D1826a43e20ea19efC46E50c2B00
Commit	

Audit Summary

Delivery Date	Aug 19, 2021
Audit Methodology	Static Analysis, Manual Review
Key Components	

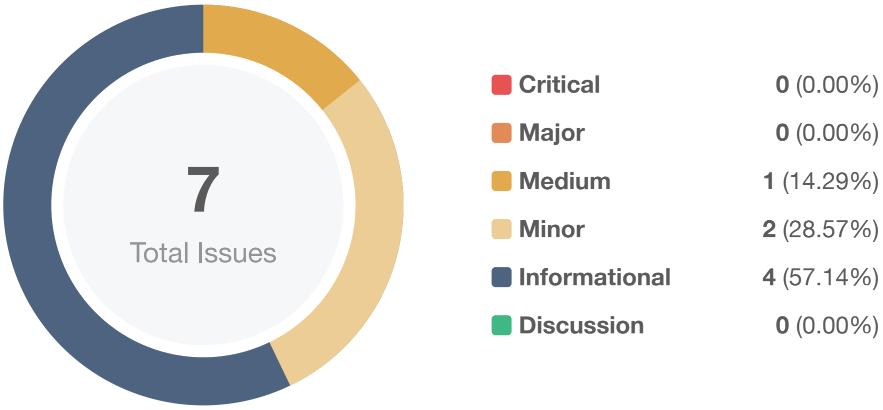
Vulnerability Summary

Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Resolved
Critical	0	0	0	0	0	0
Major	0	0	0	0	0	0
Medium	1	0	0	1	0	0
Minor	2	0	0	2	0	0
Informational	4	0	0	4	0	0
Discussion	0	0	0	0	0	0

Audit Scope

ID	File	SHA256 Checksum
SEC	SafeEnergy.sol	7ca033337978bdc7c60d4d9e800e765c77676854169b47b67a15befe8f79a795

Findings



ID	Title	Category	Severity	Status
SEC-01	Incorrect Error Message	Logical Issue	Minor	Acknowledged
SEC-02	Function Visibility Optimization	Gas Optimization	Informational	Acknowledged
SEC-03	Redundant Code	Logical Issue	Informational	Acknowledged
SEC-04	Incorrect Error Message	Logical Issue	Minor	Acknowledged
SEC-05	Redundant calculation of rBurn	Logical Issue	Informational	Acknowledged
SEC-06	Incorrect address used as Uniswap router	Data Flow	Medium	Acknowledged
SEC-07	Missing Emit Events	Coding Style	Informational	Acknowledged

SEC-01 | Incorrect Error Message

Category	Severity	Location	Status
Logical Issue	Minor	SafeEnergy.sol: 613	Acknowledged

Description

The error message in the require statement in the `includeAccount()` function does not describe the error correctly.

```
function includeAccount(address account) external onlyOwner() {
    require(_isExcluded[account], "Account is already excluded");
```

Recommendation

The message "Account is already excluded" can be changed to "Account is not excluded" .

SEC-02 | Function Visibility Optimization

Category	Severity	Location	Status
Gas Optimization	Informational	SafeEnergy.sol: 479	Acknowledged

Description

The following functions are declared as `public`, and are not invoked in any of the contracts contained within the project's scope. The functions that are never called internally within the contract can be set to external visibility for gas optimization.

- `name()`
- `symbol()`
- `decimals()`
- `totalSupply()`
- `balanceOf(address)`
- `transfer(address,uint256)`
- `allowance(address,address)`
- `approve(address,uint256)`
- `transferFrom(address,address,uint256)`
- `increaseAllowance(address,uint256)`
- `decreaseAllowance(address,uint256)`
- `isExcluded(address)`
- `totalFees()`
- `deliver(uint256)`

Recommendation

We advise that the functions' visibility specifiers are set to `external`, optimizing the gas cost of the function.

SEC-03 | Redundant Code

Category	Severity	Location	Status
Logical Issue	Informational	SafeEnergy.sol: 645~647	Acknowledged

Description

The condition `!_isExcluded[sender] && !_isExcluded[recipient]` can be included in `else` .

Recommendation

The following code can be removed:

```
... else if (!_isExcluded[sender] && !_isExcluded[recipient]) {
    _transferStandard(sender, recipient, amount);
}
```

SEC-04 | Incorrect Error Message

Category	Severity	Location	Status
Logical Issue	Minor	SafeEnergy.sol: 749, 754	Acknowledged

Description

The error message in the `require` statement in function `_setTaxFee()` and `_setBurnFee()` does not describe the error correctly.

```
function _setTaxFee(uint256 taxFee) external onlyOwner() {
    require(taxFee >= 50 && taxFee <= 1000, 'taxFee should be in 1 - 10');
    _TAX_FEE = taxFee;
}

function _setBurnFee(uint256 burnFee) external onlyOwner() {
    require(burnFee >= 50 && burnFee <= 1000, 'burnFee should be in 1 - 10');
    _BURN_FEE = burnFee;
}
```

Recommendation

The message can be changed to 'taxFee/burnFee should be in 0.5 - 10'

SEC-05 | Redundant calculation of rBurn

Category	Severity	Location	Status
Logical Issue	● Informational	SafeEnergy.sol: 655, 657, 665, 667, 676, 678, 687, 689, 722	ⓘ Acknowledged

Description

There are 4 transfer-related functions in the scope: `_transferStandard(), _transferToExcluded(), _transferFromExcluded(), _transferBothExcluded()`. In each of these functions, the value of `rBurn` is calculated, and the function `getRValues()` is called, which calculates `rBurn` again.

Recommendation

Consider adding `rBurn` into the return value in function `_getRValues()` and removing the statements to calculate rBurn in the 4 transfer-related functions. This change should require updates in all other functions that called `_getRValues()`. The following is an example with function `_transferStandard()`

```
function _transferStandard(address sender, address recipient, uint256 tAmount) private {
    //uint256 currentRate =  _getRate();
    (uint256 rAmount, uint256 rTransferAmount, uint256 rFee, uint256 tTransferAmount, uint256 tFee, uint256 tBurn, uint256 rBurn) = _getValues(tAmount);
    //uint256 rBurn =  tBurn.mul(currentRate);
    _rOwned[sender] = _rOwned[sender].sub(rAmount);
    _rOwned[recipient] = _rOwned[recipient].add(rTransferAmount);
    _reflectFee(rFee, rBurn, tFee, tBurn);
    emit Transfer(sender, recipient, tTransferAmount);
}
...
function _getValues(uint256 tAmount) private view returns (uint256, uint256, uint256, uint256, uint256, uint256, uint256) {
    (uint256 tTransferAmount, uint256 tFee, uint256 tBurn) = _getTValues(tAmount, _TAX_FEE, _BURN_FEE);
    uint256 currentRate =  _getRate();
    (uint256 rAmount, uint256 rTransferAmount, uint256 rFee, uint256 rBurn) = _getRValues(tAmount, tFee, tBurn, currentRate);
    return (rAmount, rTransferAmount, rFee, tTransferAmount, tFee, tBurn, rBurn);
}
...
function _getRValues(uint256 tAmount, uint256 tFee, uint256 tBurn, uint256 currentRate) private pure returns (uint256, uint256, uint256, uint256) {
    uint256 rAmount = tAmount.mul(currentRate);
    uint256 rFee = tFee.mul(currentRate);
    uint256 rBurn = tBurn.mul(currentRate);
    uint256 rTransferAmount = rAmount.sub(rFee).sub(rBurn);
```

```
    return (rAmount, rTransferAmount, rFee, rBurn);
}
```

SEC-06 | Incorrect address used as Uniswap router

Category	Severity	Location	Status
Data Flow	Medium	SafeEnergy.sol: 603	Acknowledged

Description

The Uniswap router address used in the require statement is on Ethereum Mainnet instead of BSC (Binance Smart Chain).

```
require(account != 0x7a250d5630B4cF539739dF2C5dAcb4c659F2488D, 'We can not exclude Uniswap router.');
```

Recommendation

If the design specifies that the Uniswap router address should not be the input of function `excludeAccount()`, please use the legit Uniswap router address on BSC.

SEC-07 | Missing Emit Events

Category	Severity	Location	Status
Coding Style	● Informational	SafeEnergy.sol: 748, 753	ⓘ Acknowledged

Description

The function that affects the status of sensitive variables should be able to emit events as notifications to users.

- `setTaxFee()`
- `setBurnFee()`

Recommendation

Consider adding events for sensitive actions, and emit them in the function.

Appendix

Finding Categories

Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how block.timestamp works.

Data Flow

Data Flow findings describe faults in the way data is handled at rest and in memory, such as the result of a struct assignment operation affecting an in-memory struct rather than an in-storage one.

Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux "sha256sum" command against the target file.

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