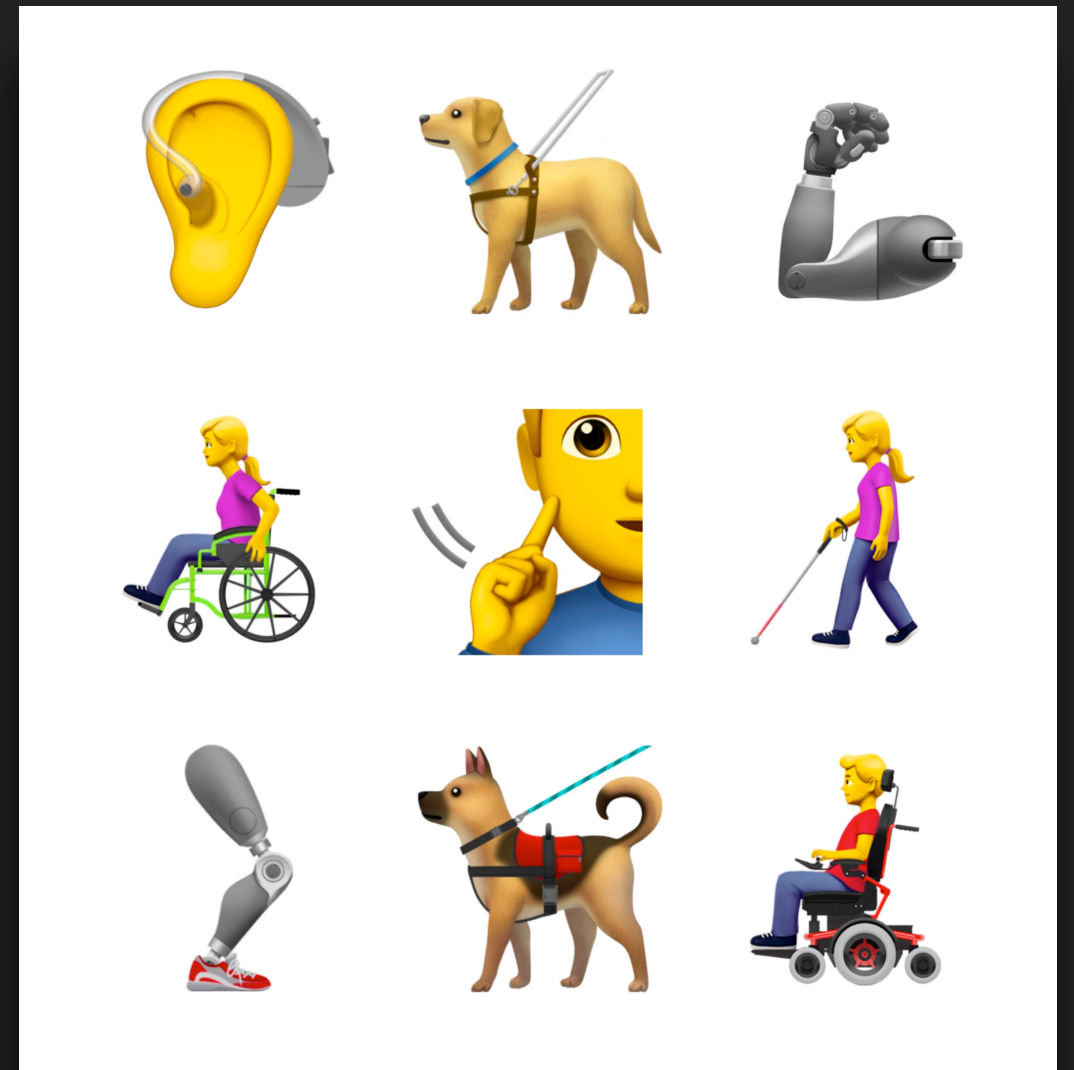




ЧТО ЭТО И КАК?

ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



Artur Basak

*instinctools EE Labs,

Lead Programmer, UI Engineer



/artur.basak



/ArturBasak



/@arturbasak

ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



НЕМНОГО ИСТОРИИ

- ▶ Закон о реабилитации 1973
- ▶ W3C 1997
- ▶ Web Accessibility Initiative (WAI)
- ▶ Поправка 508, 1998

<https://www.section508.gov/test/web-software>



WEB ACCESSIBILITY IN THE UK



Disability affects 1 in 5 in the UK
- 12.9m people



Среди взрослого населения Беларуси инвалиды составляют 6,6%, среди детей - 1,5%

Общество 30.11.2015 | 11:43



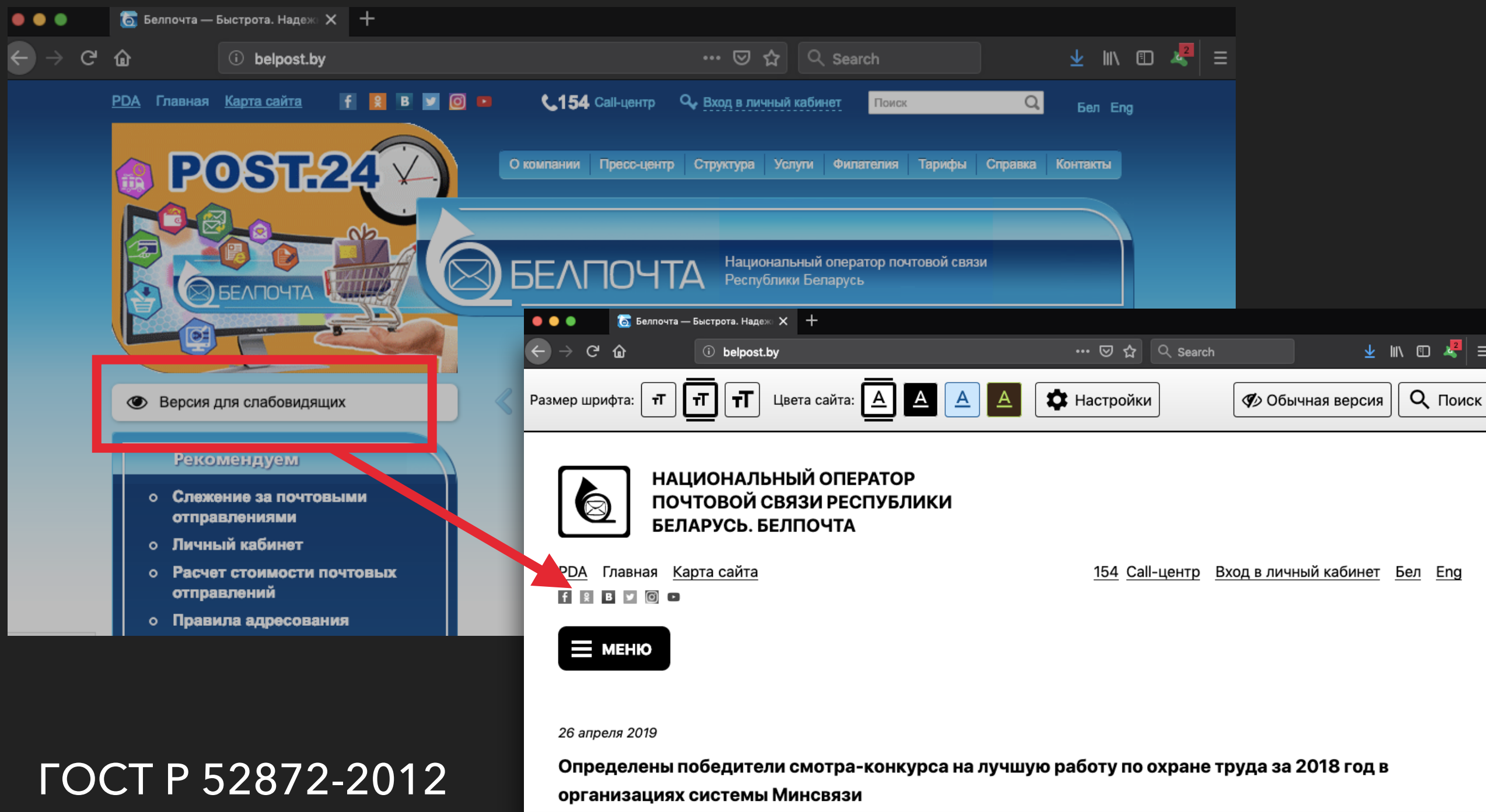
<http://mintrud.gov.by/ru/chislinv>

15%



https://www.who.int/disabilities/world_report/2011/report/en

ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



- <http://vitebskjust.gov.by/feedback/law-map/wcag>
- <https://accessibility.digital.gov>

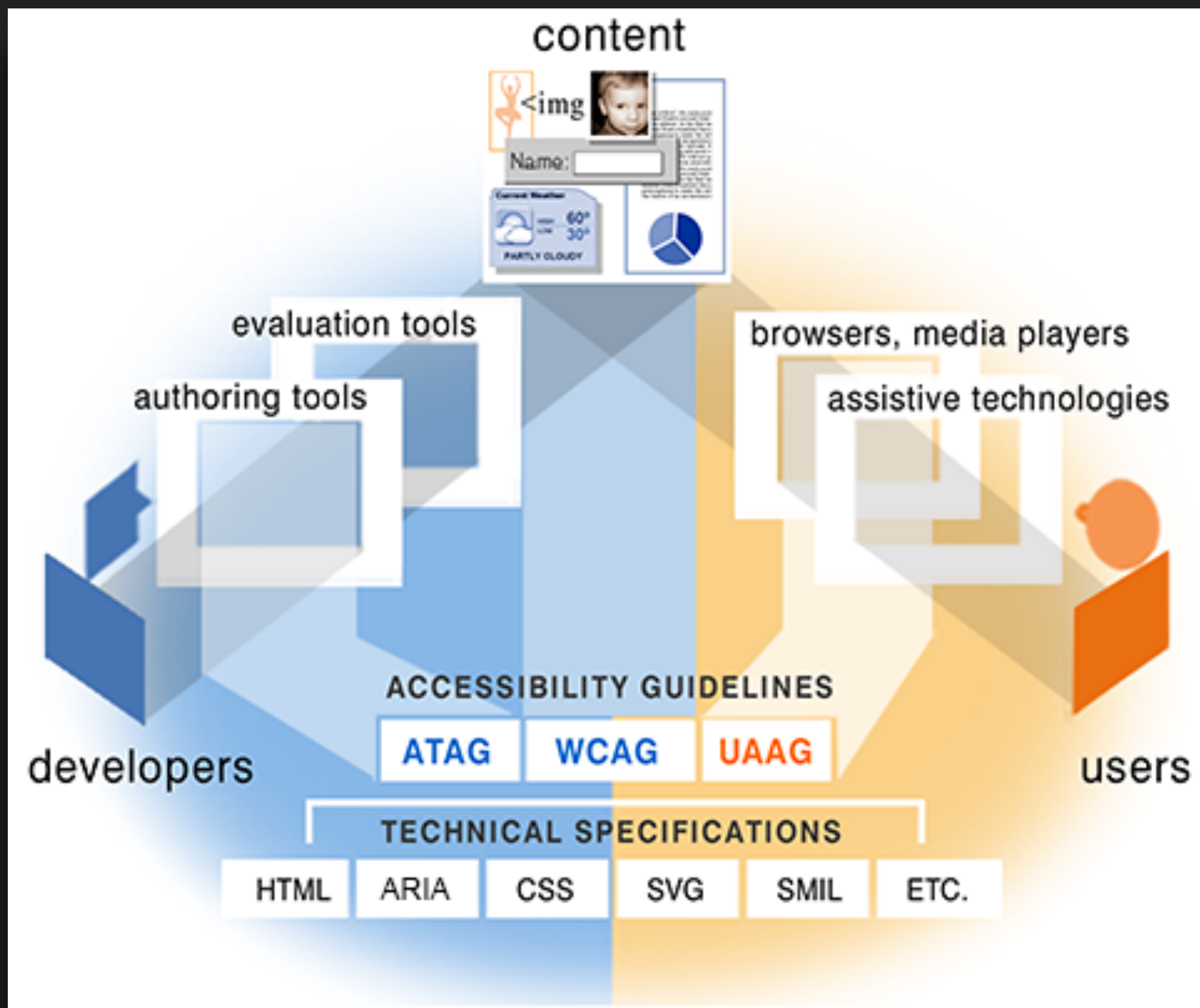


*Strategies, standards, resources to make
the Web accessible to people with
disabilities*

<https://www.w3.org/WAI>

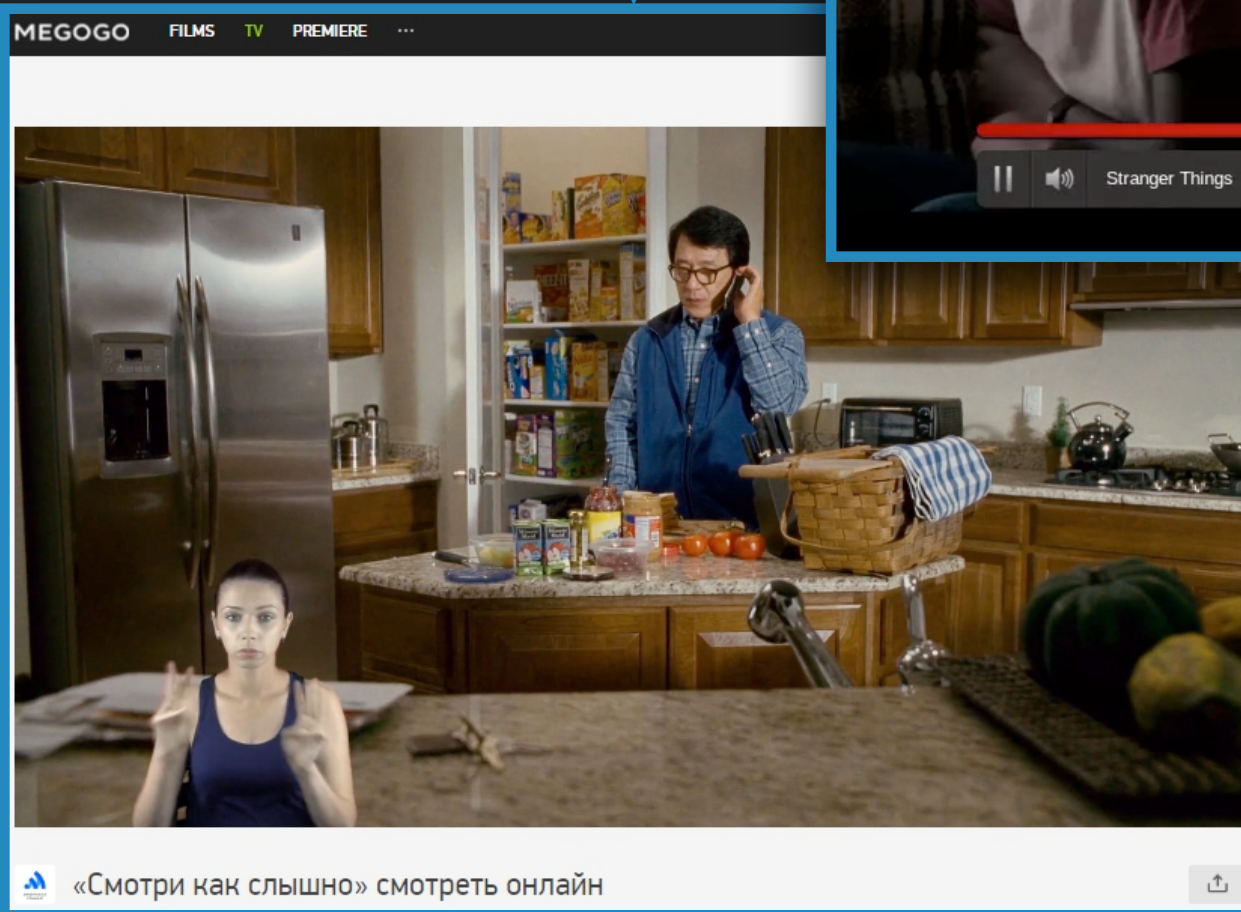
- ▶ Web Content Accessibility Guidelines (WCAG) - ISO/IEC 40500:2012
- ▶ Accessible Rich Internet Applications (WAI-ARIA)
- ▶ User Agent Accessibility Guidelines (UAAG)
- ▶ Authoring Tools Accessibility Guidelines (ATAG)
- ▶ XML Accessibility Guidelines (XAG)

ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ



ТРЕБОВАНИЯ СООТВЕТСТВИЯ WCAG

- ▶ Level A
- ▶ Level AA
- ▶ Level AAA



1. Воспринимаемость
2. Управляемость
3. Понятность
4. Надежность



- ▶ Семантический HTML
- ▶ Немного ARIA
- ▶ Изображения
- ▶ Работа с клавиатурой
- ▶ Работа с цветом
- ▶ Специфика фреймворков
- ▶ Тестирование

СЕМАНТИЧЕСКИЙ HTML

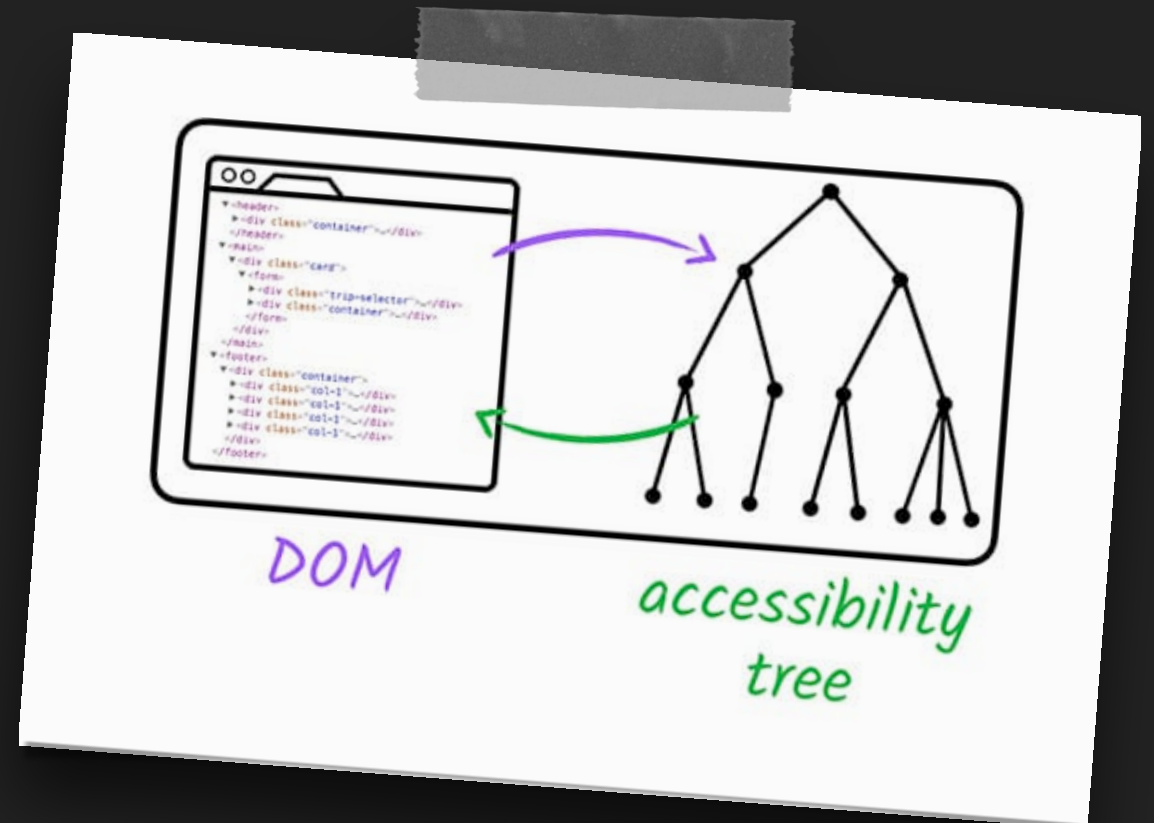
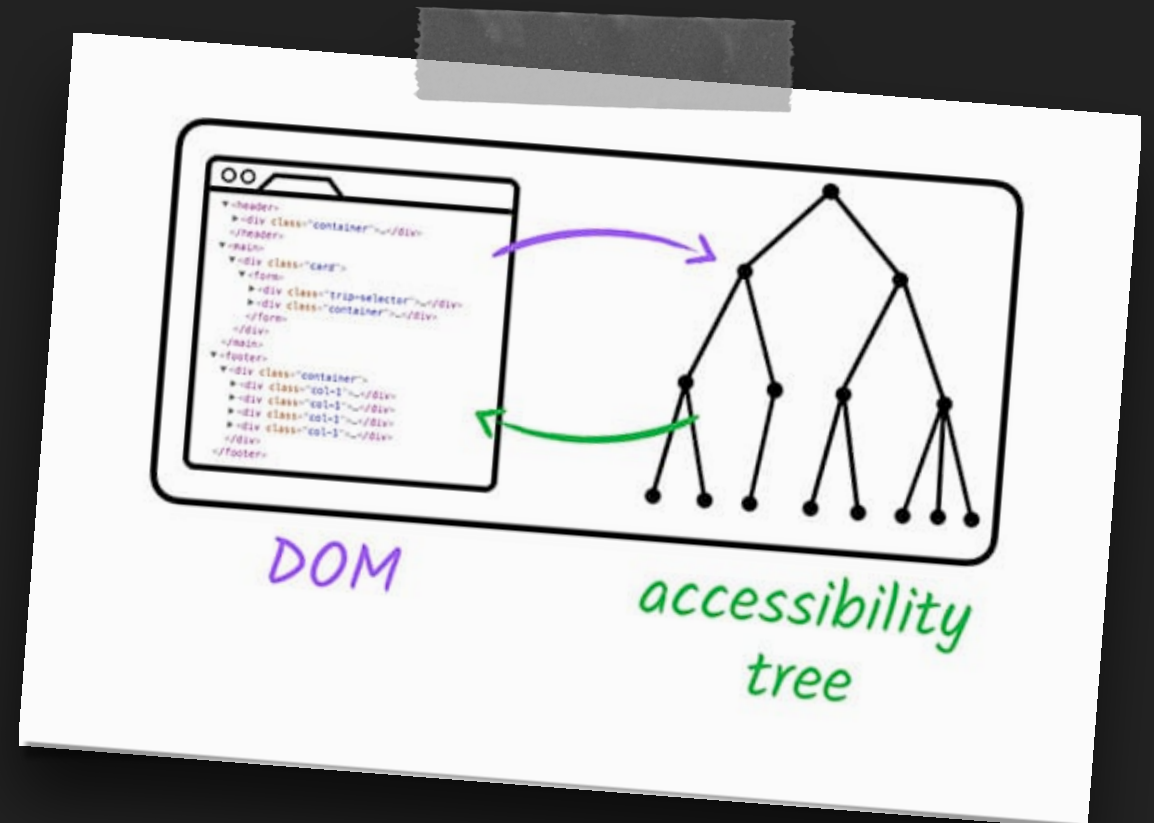
,

, <i>

<article>, <section>, <nav>, <main>

<h1>..

<div>,



ARIA (ACCESSIBLE RICH INTERNET APPLICATIONS)

§ 4.3.4. The **nav** element

Allowed ARIA role attribute values:

navigation role (default - *do not set*).

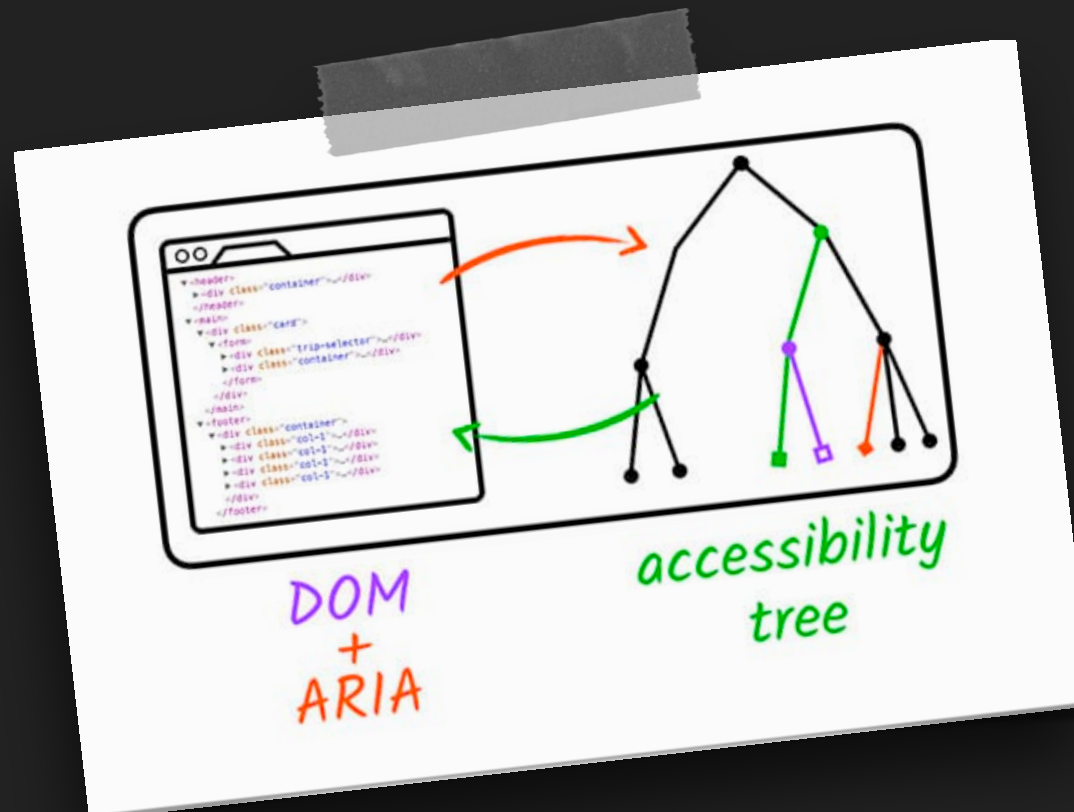
Allowed ARIA state and property attributes:

Global **aria-*** attributes

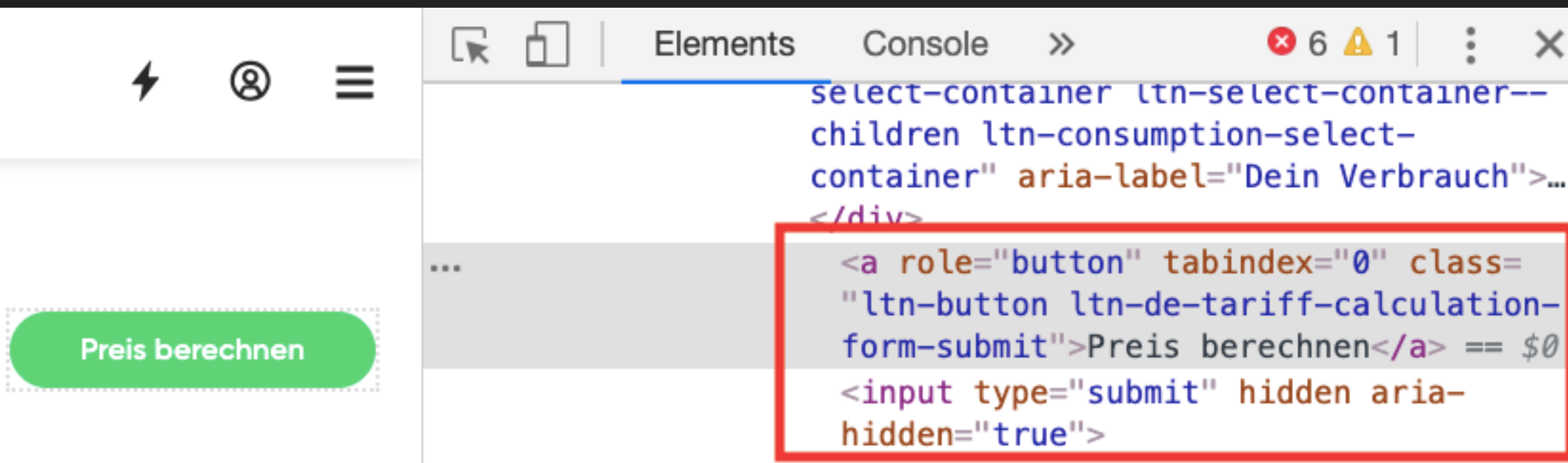
Any **aria-*** attributes applicable to the default role.

`<nav>`

`<div role=navigation>`



ARIA ВМЕСТО СЕМАНТИЧЕСКОГО HTML



СЕМАНТИЧЕСКИЙ HTML **ВМЕСТО** ARIA

1 <main role="main"> 2 ... 3 </main>							
	Chrome	Edge	Firefox	Internet Explorer	Opera	Safari	
main	26	12	21	No	16	7	

ARIA (ACCESSIBLE RICH INTERNET APPLICATIONS)



[HOME](#)

[ÜBER UNS](#)

[BLOG](#)

[KONTAKT](#)

[FAQ](#)





Lition Standardstrom

Lition sucht täglich und automatisch den günstigsten Strom an der Strombörse

📍 --

40,81€
/Monat

Du sparst 85€/Jahr (~7€/m) ⓘ



[Auswählen](#)



Biogas-Anlage im EUREF-Campus

Mit einer installierten Leistung von 0,40 MW und einer Einspeisemenge von ca. 1.700 MWh pro Jahr

📍 10829 Berlin

41,48€
/Monat

Du sparst 77€/Jahr (~6€/m) ⓘ



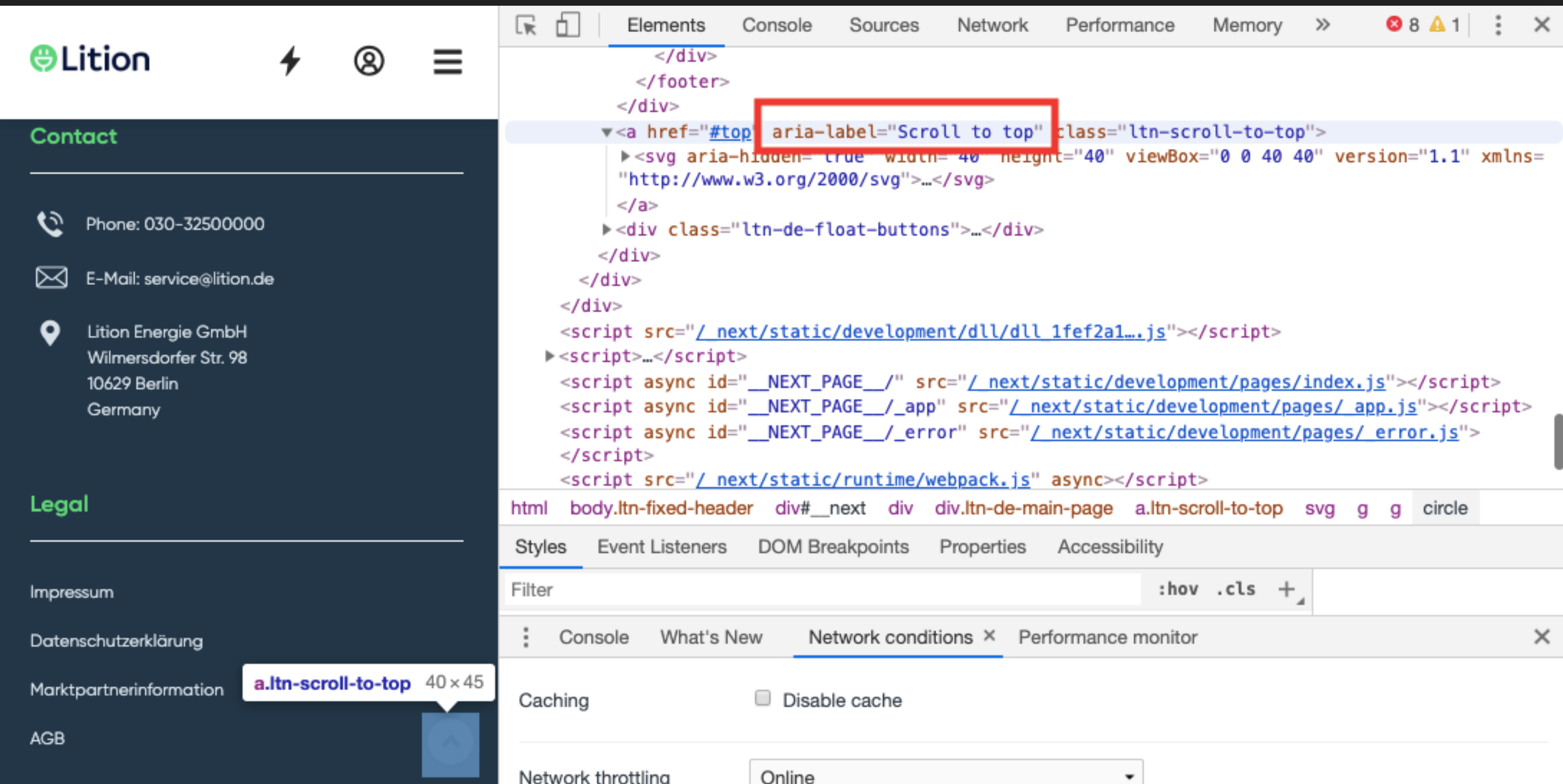
[Auswählen](#)

ARIA (ACCESSIBLE RICH INTERNET APPLICATIONS)

- ▶ aria-label
- ▶ aria-hidden
- ▶ aria-live
- ▶ aria-controls
- ▶ aria-expanded, aria-selected

<https://www.w3.org/TR/wai-aria-1.2>

ARIA-LABEL (ALT TEXT)



Lition

Contact

Phone: 030-32500000

E-Mail: service@lition.de

Lition Energie GmbH
Wilmsdorfer Str. 98
10629 Berlin
Germany

Legal

Impressum

Datenschutzerklärung

Marktpartnerinformation

AGB

Elements

```
</div>
</footer>
</div>
<a href="#top" aria-label="Scroll to top" class="ltn-scroll-to-top">
  <svg aria-hidden="true" width="40" height="40" viewBox="0 0 40 40" version="1.1" xmlns="http://www.w3.org/2000/svg">...</svg>
</a>
<div class="ltn-de-float-buttons">...</div>
</div>
</div>
<script src="/_next/static/development/dll/dll_1fef2a1...js"></script>
<script>...</script>
<script async id="__NEXT_PAGE__/" src="/_next/static/development/pages/index.js"></script>
<script async id="__NEXT_PAGE__/_app" src="/_next/static/development/pages/_app.js"></script>
<script async id="__NEXT_PAGE__/_error" src="/_next/static/development/pages/_error.js">
</script>
<script src="/_next/static/runtime/webpack.js" async></script>
```

html body.ltn-fixed-header div#__next div div.ltn-de-main-page a.ltn-scroll-to-top svg g g circle

Styles Event Listeners DOM Breakpoints Properties Accessibility

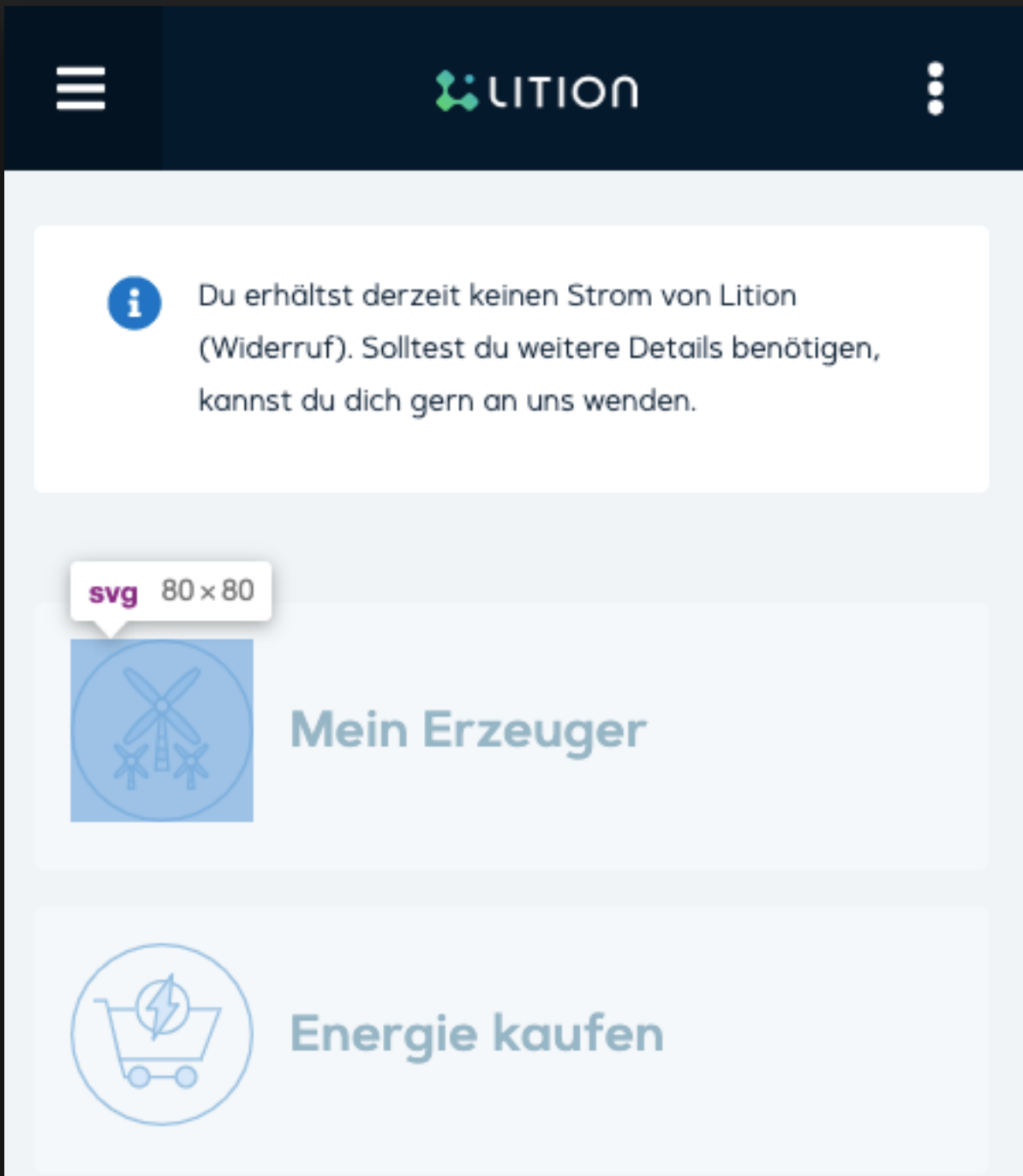
Filter :hov .cls +

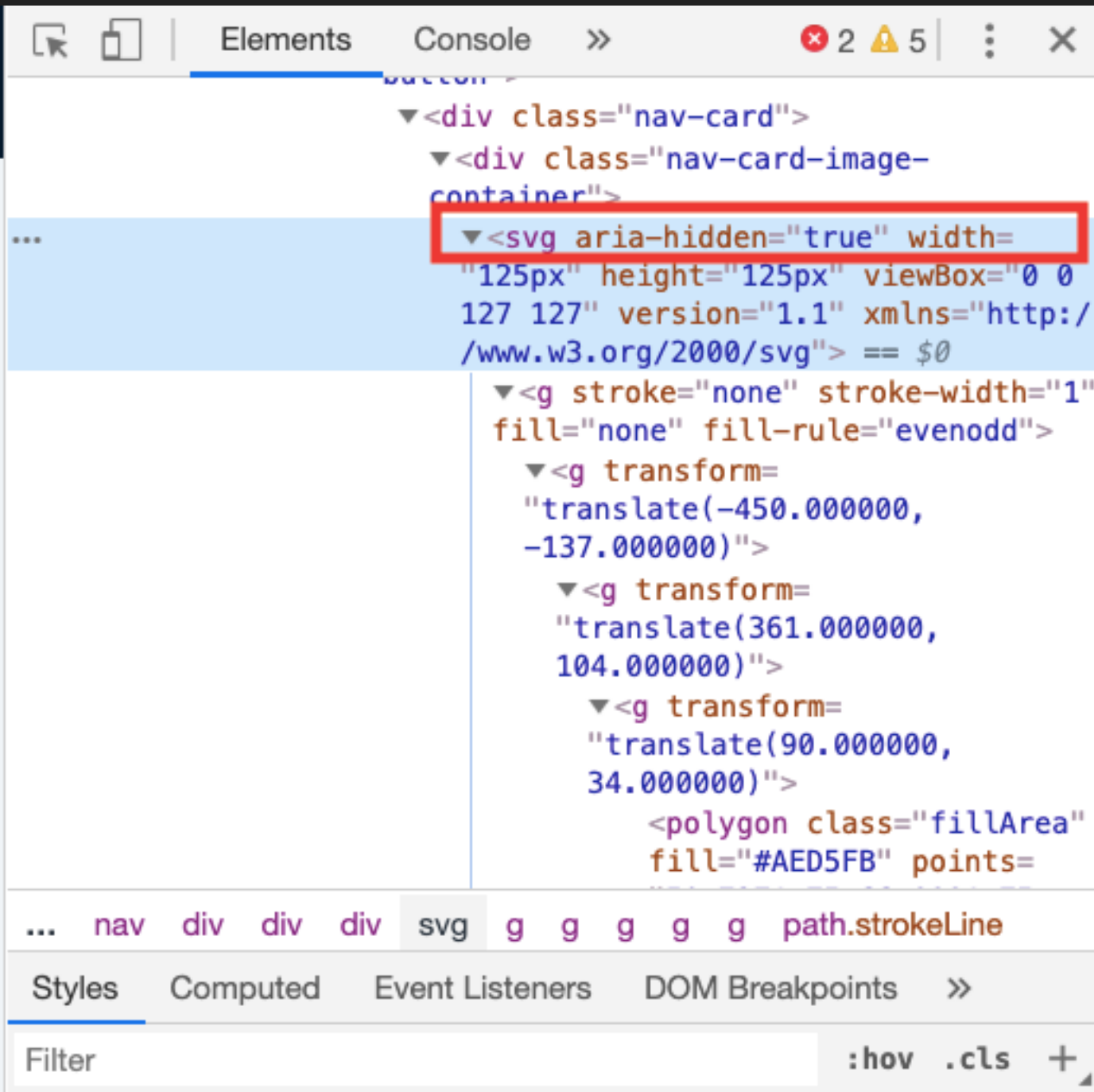
Console What's New Network conditions x Performance monitor

Caching ☐ Disable cache

Network throttling Online

ARIA-HIDDEN (TRUE, FALSE)





ARIA-LIVE (OFF, ASSERTIVE, POLITE)

⚠ Die Eingabe von Zählerständen wird mit dem Belieferungsbeginn freigeschaltet. ✕

Zählerstände eintragen

Zählerstände

kWh

Zählernummer ungültig.

Datum der Ablesung



Format bearbeiten dd.mm.yyyy

Abschicken

Verlauf

```
<script id="MITIGATOR_INJECTOR_document_writeln" generator="extension">...</script>
<script id="MITIGATOR_INJECTOR_innerHTML" generator="extension">...</script>
<head>...</head>
<body>
  <noscript>You need to enable JavaScript to run this app.</noscript>
  <div id="root">
    <div id="routes">
      <div aria-live="assertive" class="notifications">...</div>
      <div class="page-loader">
        <div role="progressbar" aria-live="assertive" class="loader-backdrop loader-backdrop--full-screen" aria-hidden="true"> == $0
          <svg class="spinner" spinner--size=md xmlns="http://www.w3.org/2000/svg" viewBox="0 0 50 50">...</svg>
        </div>
      </div>
    <div id="app-layout">...</div>
  </div>
</body>
<script type="text/javascript" src="/static/js/main.65778997.js">
</script>
```

html body #root #routes div div.loader-backdrop.loader-backdrop--full-screen

Styles Event Listeners DOM Breakpoints Properties Accessibility

Filter :hov .cls + position 0

Console What's New Network conditions X Performance monitor X

Caching ☐ Disable cache

ARIA-CONTROLS (ELEMENT IDENTIFIER)



Lition

berechne gleich deinen günstigen Ökostrompreis.

Deine PLZ

Dein Verbrauch

- 1 Person - 1600 kWh/Jahr
- 2 Personen - 2400 kWh/Jahr
- 3 Personen - 3200 kWh/Jahr
- 4 Personen - 4200 kWh/Jahr

Elements Console

consumption value
placeholder="Dein Verbrauch"
class="ltn-select"
autocomplete="off" tabindex="0">

><svg id="listbox-1556627567611-expand-button" role="button" aria-label="Show select options" aria-controls="listbox-1556627567611" tabindex="0" xmlns="http://www.w3.org/2000/svg" width="14" height="9" viewBox="0 0 14 9" class="ltn-select-chevron-down" aria-expanded="true"></svg>

><ul id="listbox-1556627567611" class="ltn-select-options" role="listbox" aria-live="polite" aria-labelledby="listbox-1556627567611-expand-button">...

... #listbox-1556627567611-expand-button

Styles Computed Event Listeners

ARIA-EXPANDED (TRUE, FALSE)

LITION

Vertrag #751072

DE

FAQ

Bekomme ich Grünstrom? / Was ist die Stromkennzeichnung?

Welche Vorteile bringt mir ein Wechsel zu Lition?

Wir liefern ausschließlich erneuerbare Energien. Über unsere eigens entwickelte Handelsplattform verbinden wir dich mittels unserer Blockchain-Technologie direkt mit dem Kraftwerk deiner Wahl. Auf diese Weise können wir Deutschlands günstigsten Abschlag anbieten. Außerdem erhalten bei uns teilnehmende Kraftwerke den Aufpreis zum Standardstrom nach Abzug eventueller Kosten direkt auf ein Bankkonto ihrer Wahl. Wir stellen sicher, dass es von deiner Stromrechnung ohne Umwege weitergeleitet wird. Somit erhält das Kraftwerk mehr Geld - für den gleichen, dezentralen Strom. So, wie es sein soll.

Elements

<div class="title-container">...</div>

<div id="1-0" class="answer-container" aria-hidden="true">...</div>

<div class="question-container question-container--expanded" role="region" aria-live="polite">

<div class="title-container"> == \$0

<div aria-controls="2-1" tabindex="0" class="title" aria-expanded="true">Welche Vorteile bringt mir ein Wechsel zu Lition?</div>

<svg tabindex="-1" role="button" aria-label="Disclosure

main

div

div

div.title-container

Styles

Computed

Event Listeners

Filter

:hov .cls

element.style {

}

Console

What's New

ИЗОБРАЖЕНИЯ

[HOME](#)[ÜBER UNS](#)[BLOG](#)[KONTAKT](#)[FAQ](#)

Elements >> 7 1

```
</ul>
</div>
</section>
<section class="ltn-de-about-us-
page-community-power">
  <div class="ltn-de-about-us-
page-community-power-description">
...</div>
  <div class="ltn-de-about-us-
page-offers">
    <div class="ltn-de-about-us-
page-offer">...</div>
...
     == $0
    <div class="ltn-de-about-us-
page-offer">...</div>
  </div>
</section>
... div img.ltn-de-about-us-page-offers-image
```

Styles Computed Event Listeners >>

Filter :hov .cls +

Console Network conditions x

Caching

☐ Disable cache

ИЗОБРАЖЕНИЯ

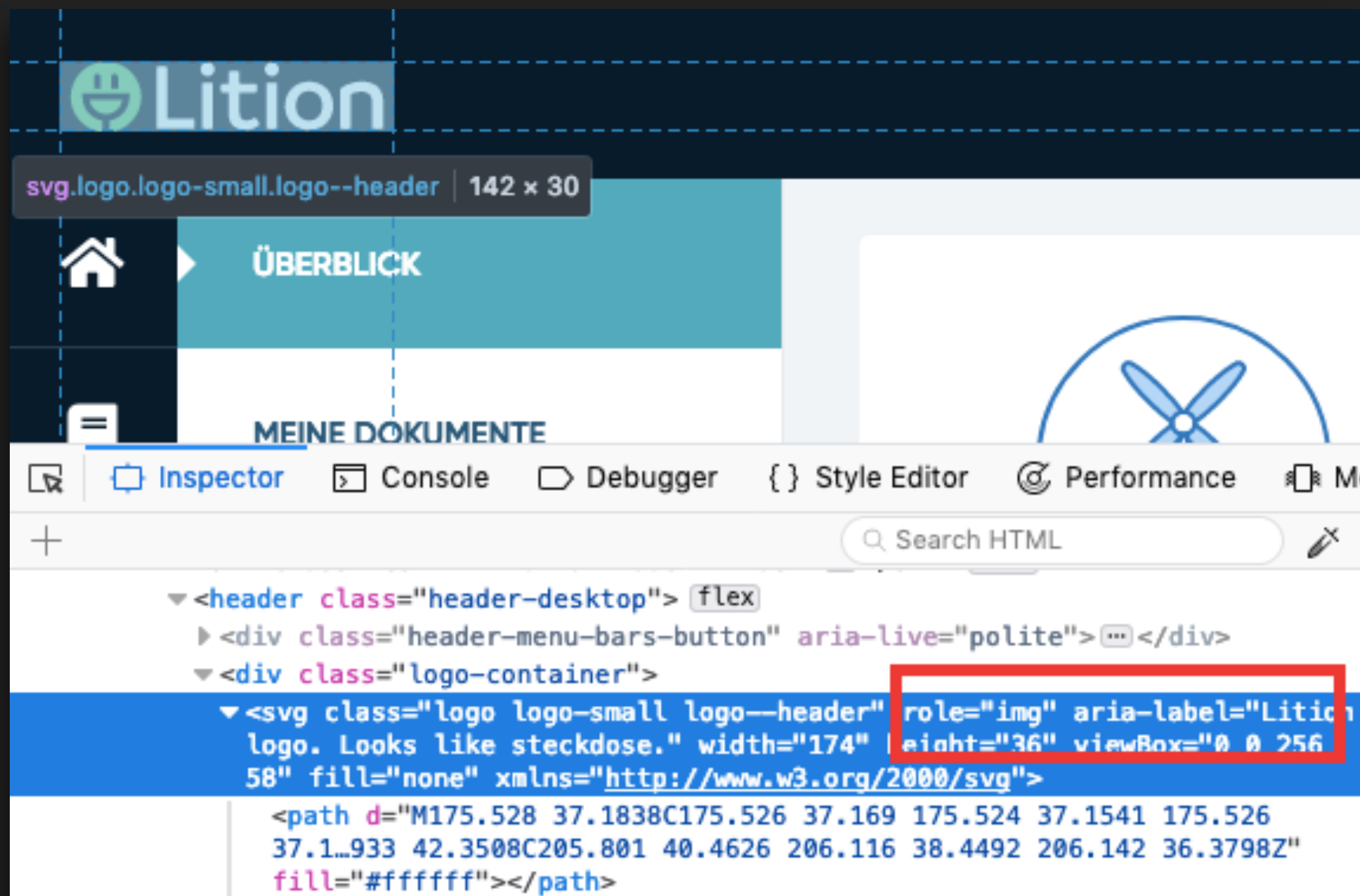
- ▶ Декоративные (`alt=`, `aria-hidden=true`)
- ▶ Информативные (`alt=description`, `figure + figcaption`)
- ▶ Функциональные
- ▶ Комплексные (`alt=description`, `figure + figcaption`)
- ▶ Текст (`alt=text`)

https://developer.mozilla.org/en-US/docs/Web/Accessibility/ARIA/Roles/Role_img

<https://www.w3.org/WAI/tutorials/images/decision-tree>

ИЗОБРАЖЕНИЯ SVG

<https://css-tricks.com/accessible-svgs>



РАБОТА С КЛАВИАТУРОЙ OUTLINE

Buttons

Default

Tarif berechnen

Hover

Tarif berechnen

Button shifts 4px on y axis
and shadow appears

Click

Tarif berechnen

Button shifts back 4px on y axis
and shadow disappears

Inactive

Tarif berechnen

РАБОТА С КЛАВИАТУРОЙ OUTLINE



Mitglied werden in 5 Minuten. Den Rest machen wir.

 Deine PLZ

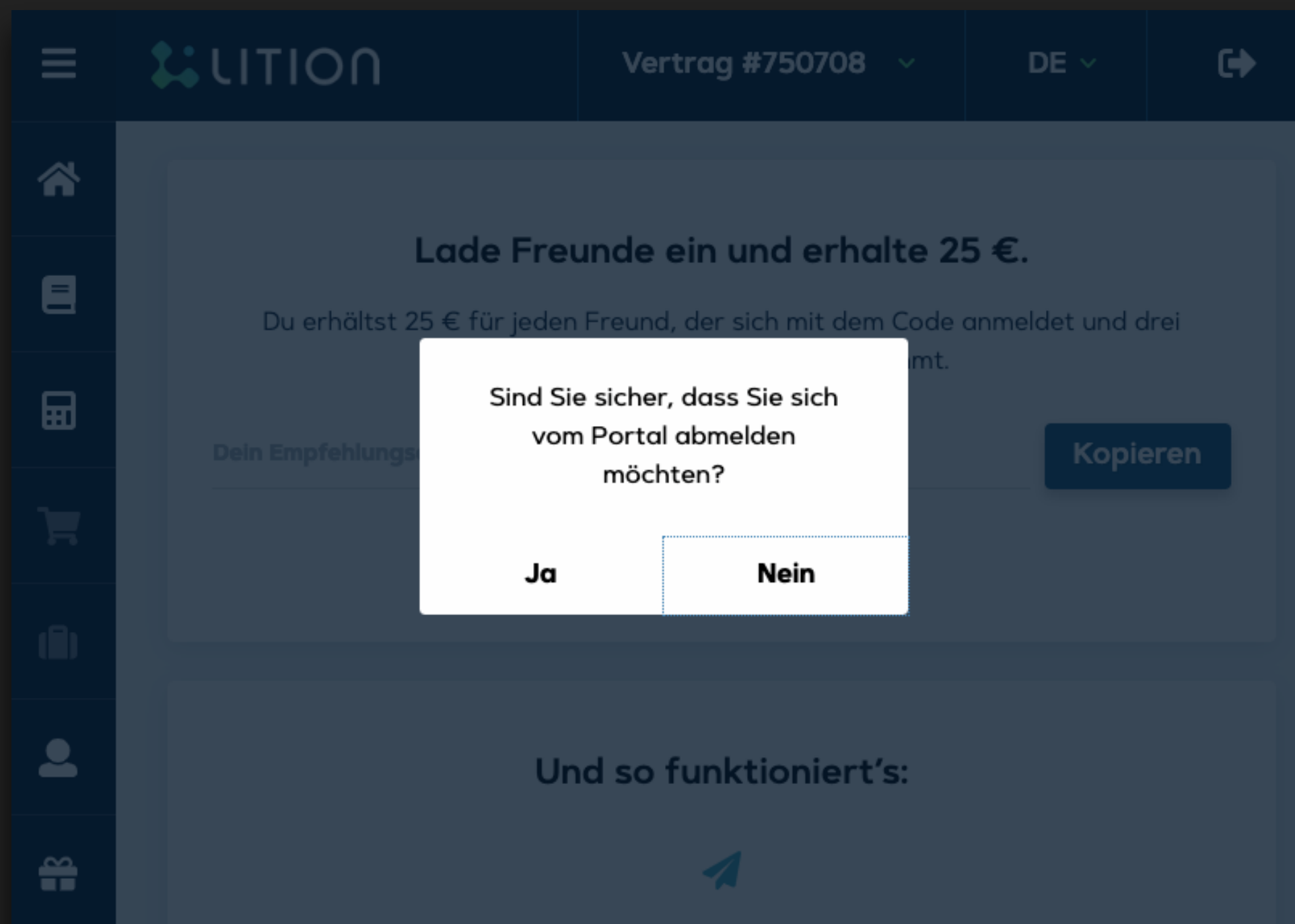
 Dein Verbrauch



Preis berechnen

 Bitte erst PLZ und Verbrauch eingeben.

РАБОТА С КЛАВИАТУРОЙ FOCUS MANAGEMENT



РАБОТА С КЛАВИАТУРОЙ FOCUS MANAGEMENT

```
componentDidUpdate(prevProps) {
  const { show } = this.props;
  const isOpen = !prevProps.show && show;
  const isClose = prevProps.show && !show;

  if (isOpen) {
    return focusManager.capture(this.modal);
  }

  if (isClose) {
    return focusManager.release();
  }
}

render() {
  const { className, labels, show, onConfirm, onCancel } = this.props;
  const classes = classNames('confirm', show && 'confirm--show', className);

  return (
    <div aria-hidden={!show ? undefined : true} className={classes} ref={modal => (this.modal = modal)}>
      <dialog/>
    </div>
  );
}
```

РАБОТА С КЛАВИАТУРОЙ WAI ARIA PRACTICES

The screenshot displays a web application interface for a profile management system. The top navigation bar includes a hamburger menu, the 'LITION' logo, a contract number 'Vertrag #750708', a language selector 'DE', and a refresh button. The main content area is titled 'Profil' and features two tabs: 'Kundendaten' (selected) and 'Vertragsdaten'. The 'Kundendaten' tab contains three input fields: 'Vorname' (Max), 'Nachname' (Mustermann), and 'Geburtsdatum' (Dec 31, 1999). A calendar icon is next to the birth date field, and a format hint 'Format bearbeiten dd.mm.yyyy' is visible below it. On the right side, the browser's developer tools are open, showing the 'Elements' panel. The selected element is a button with the ID 'personalDataTab', which has the role 'tab' and is currently selected. The HTML structure shows a tablist containing two tabs: 'personalDataTab' and 'paymentDataTab'.

```
<div class="profile-page-form">  
  <div class="profile-form">  
    <div class="profile-form-tab-list" role="tablist">  
      <button id="personalDataTab" role="tab" aria-selected="true" aria-controls="personalDataTabPanel" aria-describedby="personalDataTabErrors">...</button>  
      <button id="paymentDataTab" role="tab" aria-selected="false" aria-controls="paymentDataTabPanel" aria-describedby="paymentDataTabErrors">...</button>  
    </div>  
  </div>  
</div>
```

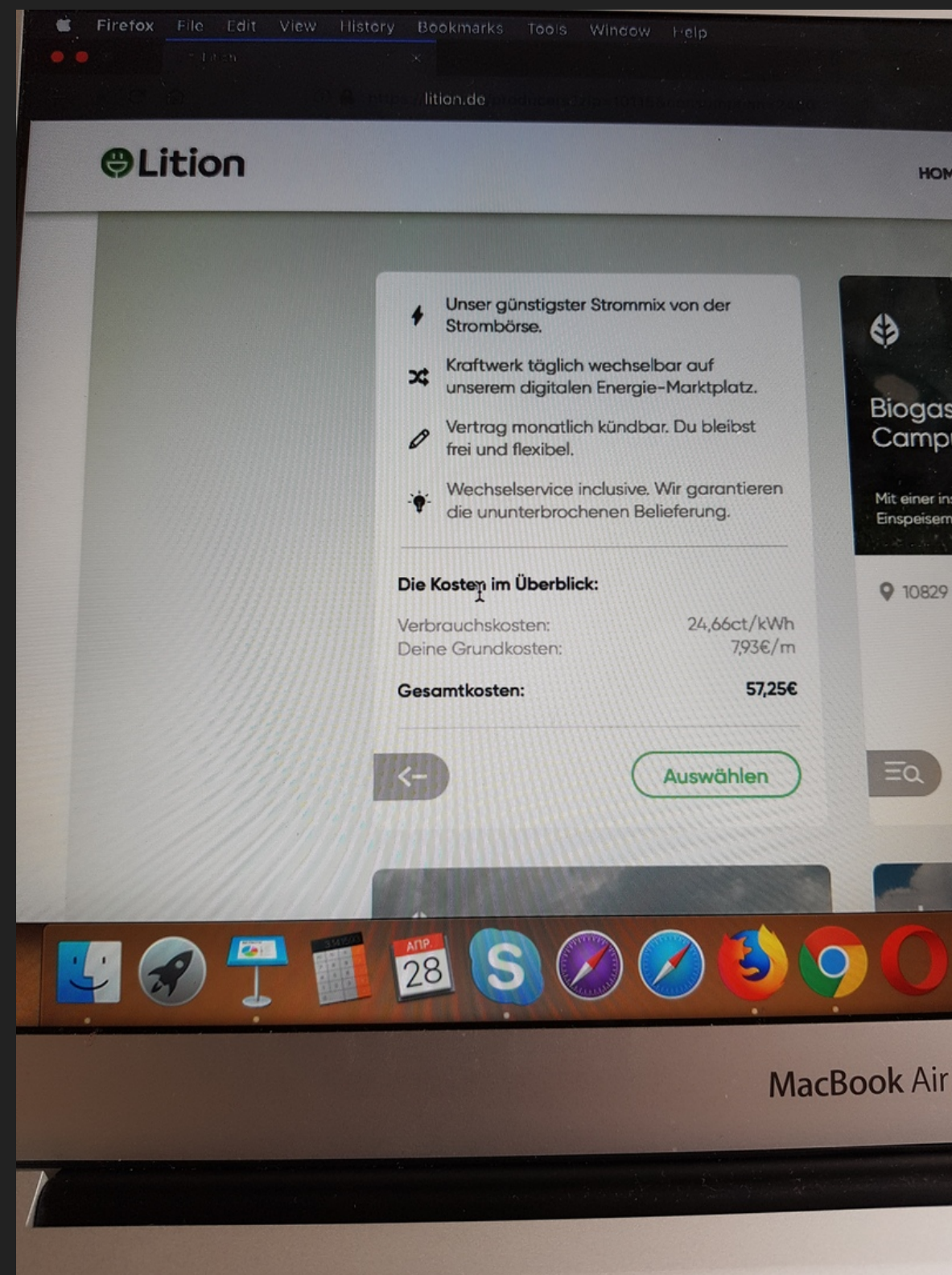
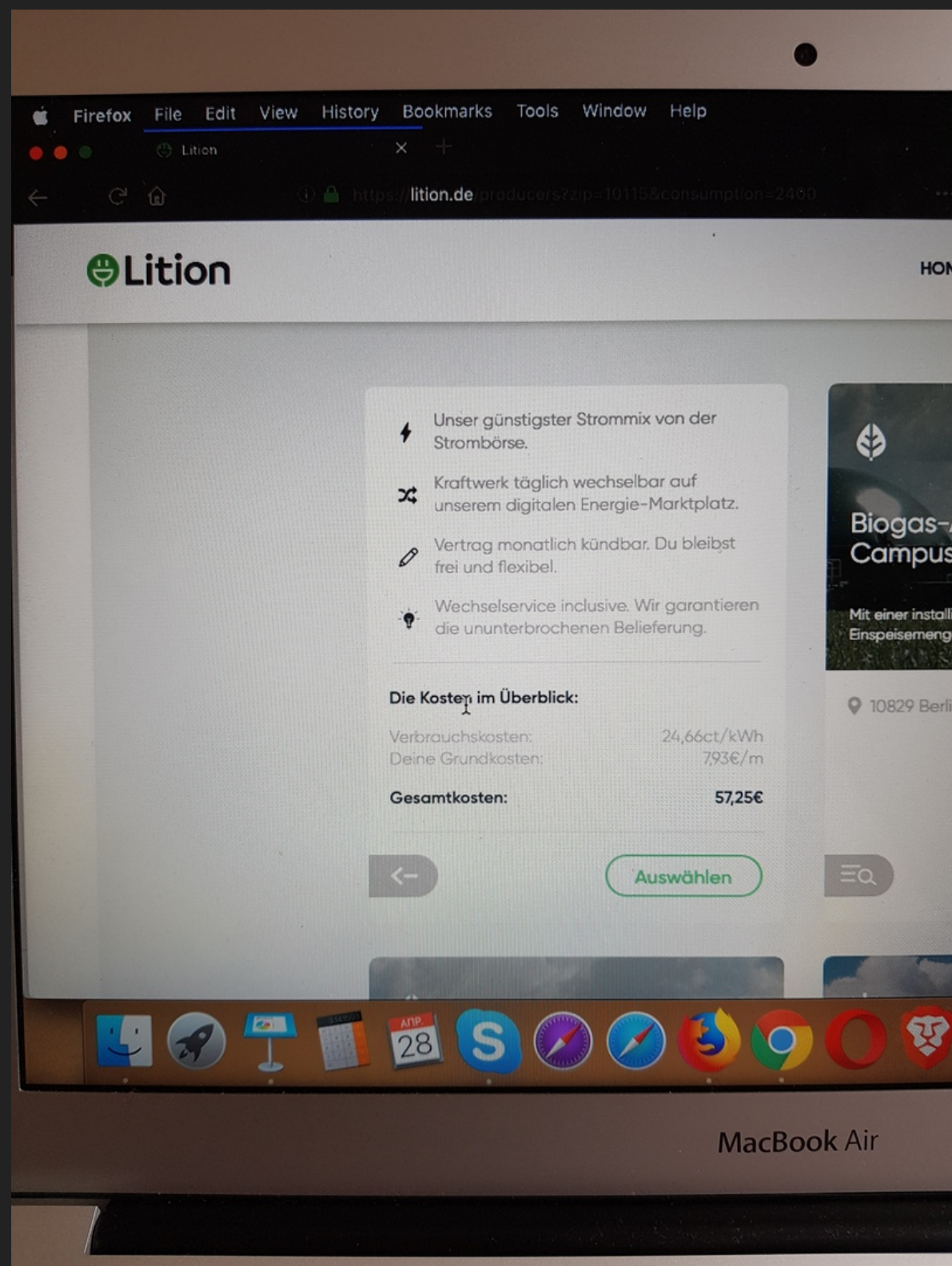
РАБОТА С КЛАВИАТУРОЙ WAI ARIA PRACTICES

<https://webaim.org/techniques/keyboard>

Interaction	Keystrokes	Notes
Navigate to most elements	• Tab • Shift + Tab - navigate backward	• Keyboard focus indicators must be present. • Navigation order should be logical and intuitive.
Link	Enter	
Button	Enter or Spacebar	Ensure elements with ARIA role="button" can be activated with both key commands.
Checkbox	Spacebar - check/uncheck a checkbox	Checkboxes should be used when one or more option can be selected.
Radio buttons	• ↑/↓ or ←/→ - select an option. • Tab - move to the next element.	Radio buttons should be used when only one option from a group can be selected.
Select	• ↑/↓ - navigate between menu	You can also filter by typing letters, but this behavior varies by browser. Some will filter as you type, like

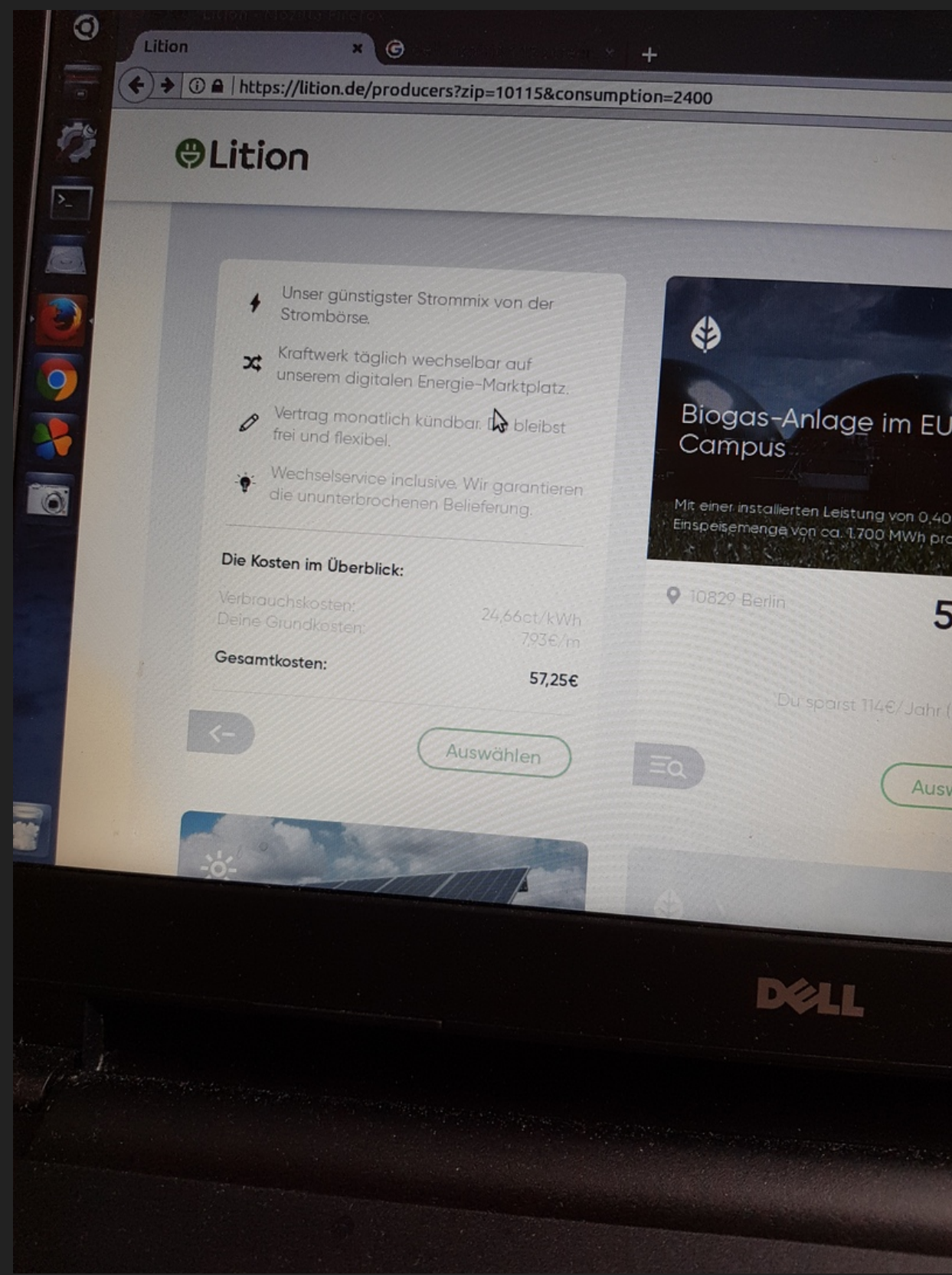
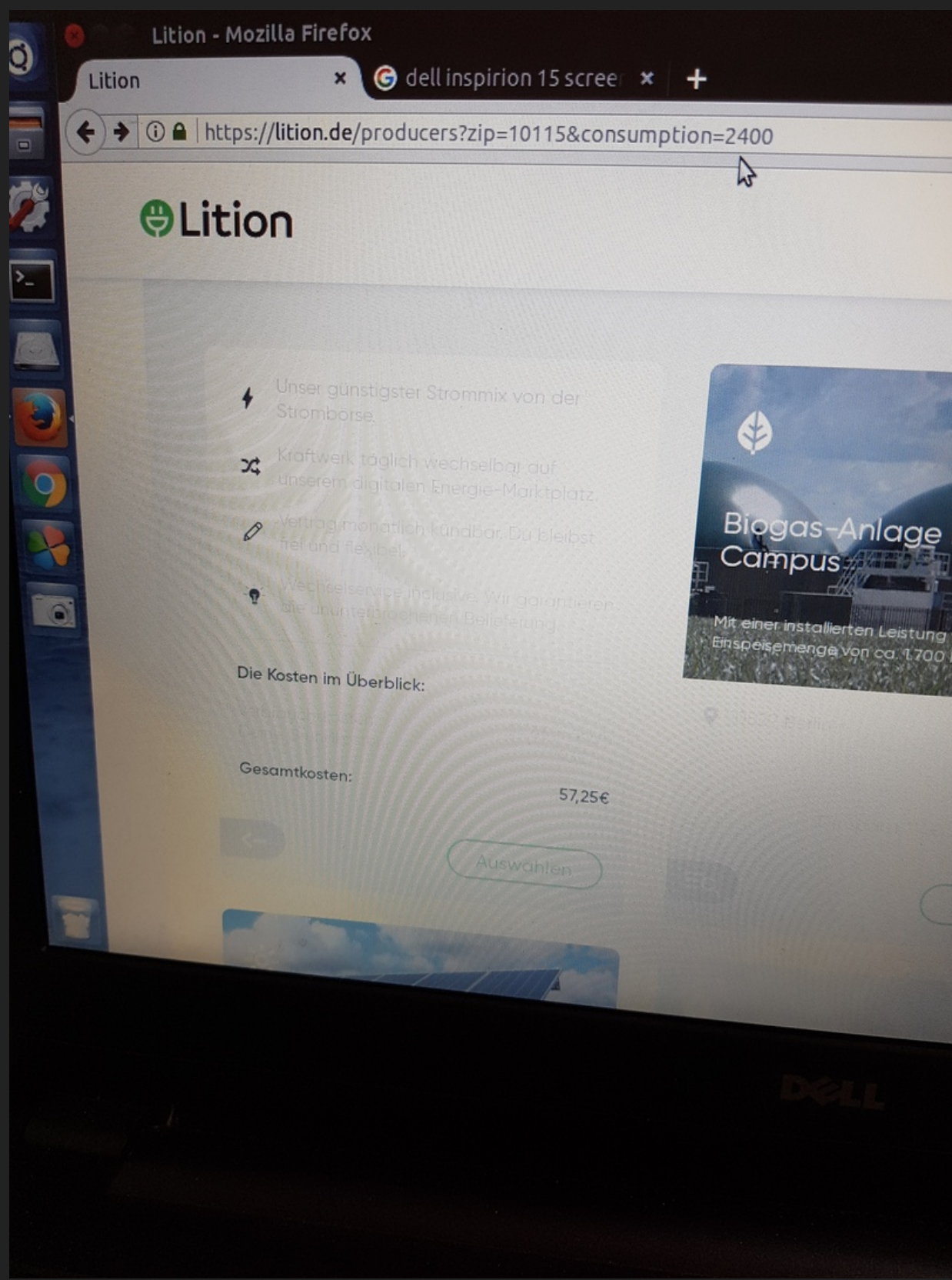
ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ

LED SCREEN, GLOSSY



ДОСТУПНОСТЬ ВЕБ-ИНТЕРФЕЙСОВ

LCD SCREEN



AMOLED, BLUE LIGHT FILTER OFF



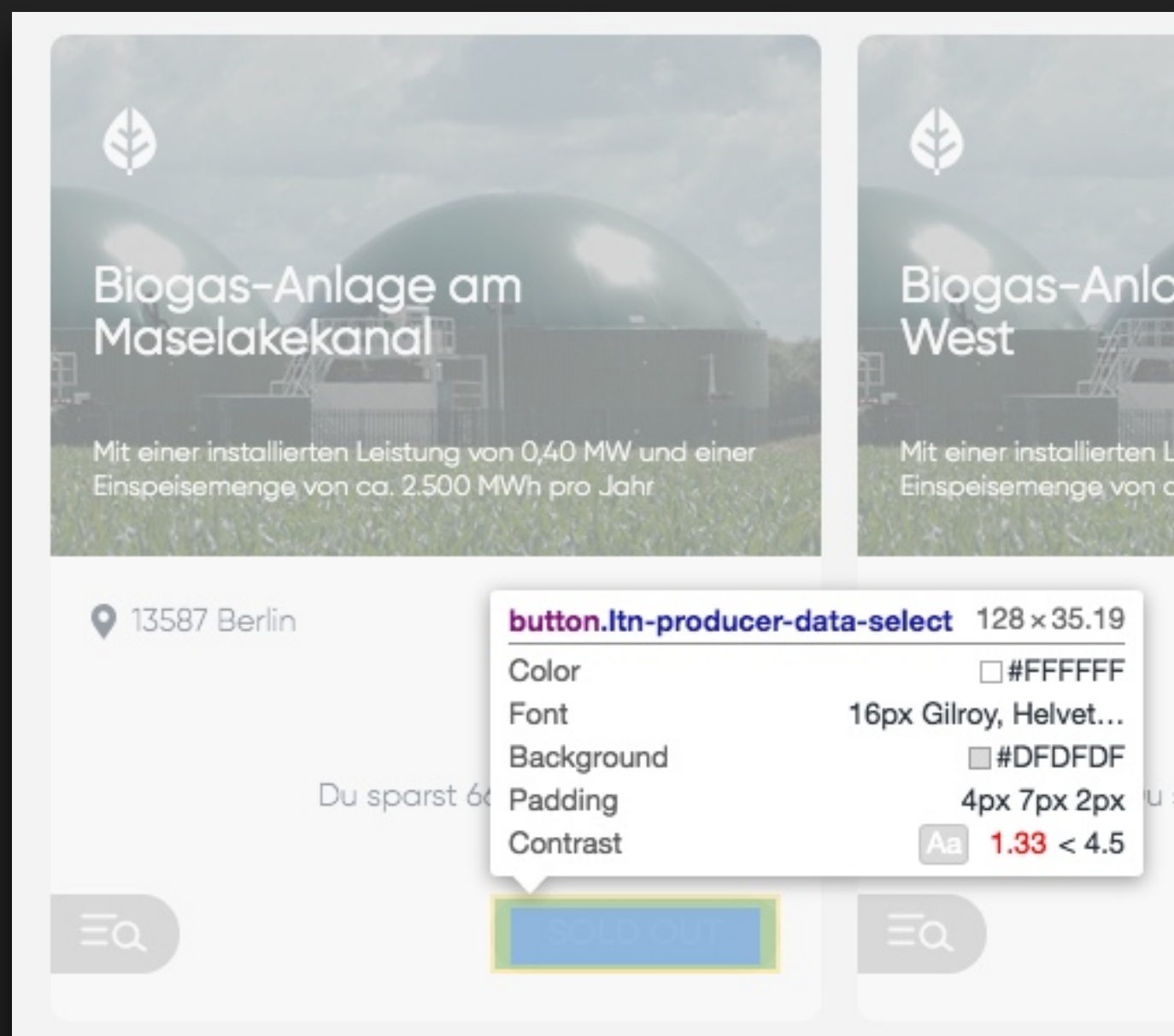
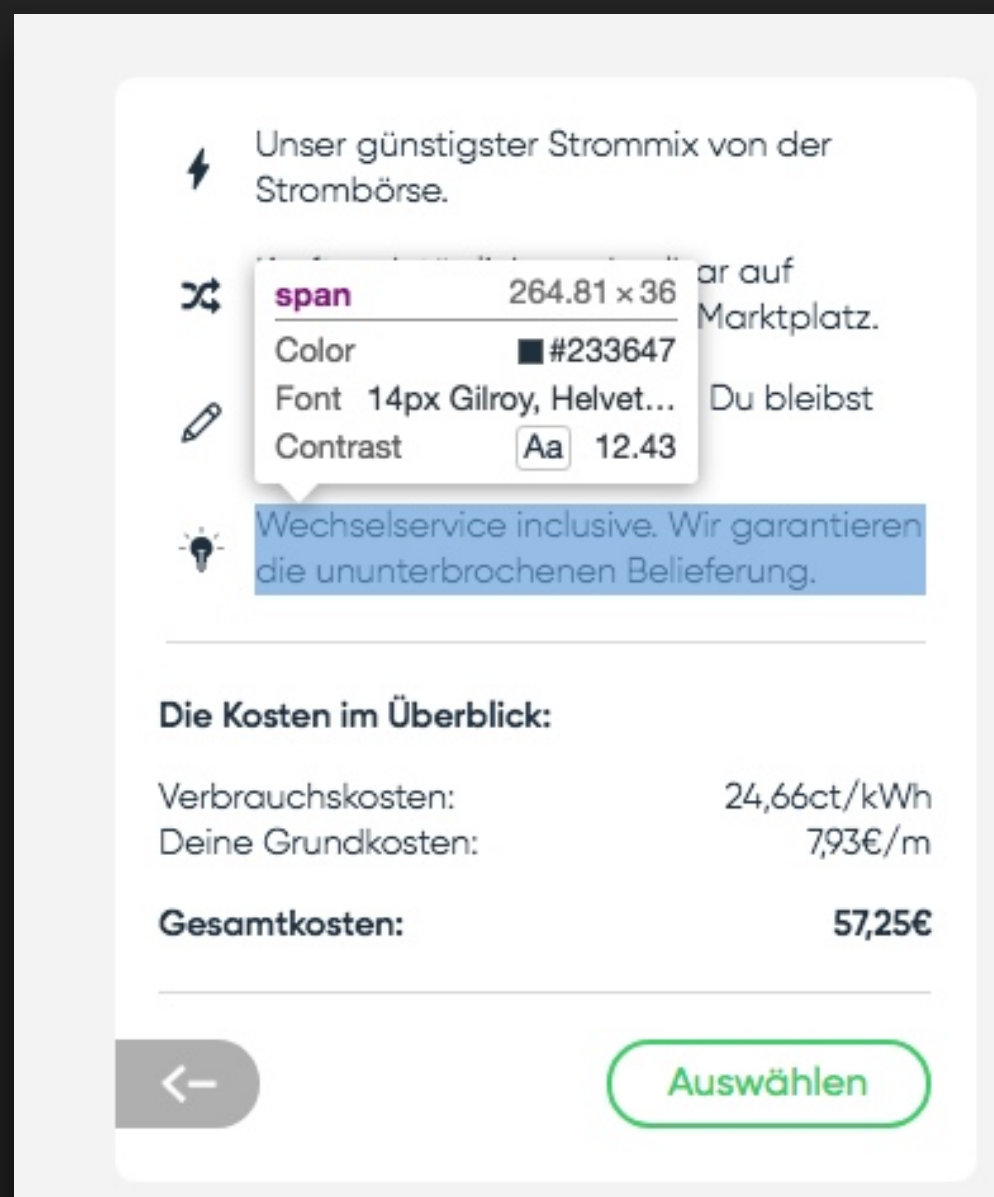
РАБОТА С ЦВЕТОМ

<https://contrast-ratio.com>

<https://www.w3.org/TR/2008/REC-WCAG20-20081211/#relativeluminancedef>

<https://www.w3.org/TR/2008/REC-WCAG20-20081211/#contrast-ratiodef>

4.5 : 1



РАБОТА С ЦВЕТОМ

<https://itunes.apple.com/us/app/sim-daltonism>

The image shows a screenshot of the Lition website, which is a platform for buying and selling energy. The website is displayed in a browser window. A color vision simulator, titled "Deuteranopia", is overlaid on the right side of the browser window. The simulator shows a list of color vision deficiencies and their corresponding percentages of the population affected. The list includes: Normal Vision (0%), Red-Green Confusion (1%), Deuteranopia (1%), Deuteranomaly (2%), Protanopia (3%), Protanomaly (4%), Yellow-Blue Confusion (5%), Tritanopia (5%), Tritanomaly (6%), Monochromacy (7%), and Partial Monochromacy (8%). The website content includes a header with the Lition logo and navigation links (HOME, ÜBER UNS, BLOG, KONTAKT, FA). The main content area features a section titled "Strom kaufen" (Buy electricity) with a sub-header "Du möchtest günstigen Ökostrom beziehen? Werde Lition Mitglied und suche dir deine grüne Quelle selbst aus." (You want to buy cheap green electricity? Become a Lition member and find your own green source yourself). Below this is a "Join" button. The bottom of the image shows a mobile app interface for Lition, with a sidebar menu containing options like OVERVIEW, MY DOCUMENTS, SUBMIT METER READINGS, BUY ENERGY, DIRECT TRADING, and PROFILE. The main content of the app shows details for a "Bio-Erdgas-Anlage im EUREF-Campus" (Bio-natural gas plant in the EUREF campus), including its peak capacity (0.4 MW), Ethereum address, location (Torgauer Str. 12-15, 108 29 Berlin, de), and a description of the plant's capacity and expected annual output.

Deuteranopia

Normal Vision 0%

Red-Green Confusion

✓ Deuteranopia 1%

Deuteranomaly 2%

Protanopia 3%

Protanomaly 4%

Yellow-Blue Confusion

Tritanopia 5%

Tritanomaly 6%

Monochromacy 7%

Partial Monochromacy 8%

Lition

HOME ÜBER UNS BLOG KONTAKT FA

Strom kaufen

Du möchtest günstigen Ökostrom beziehen? Werde Lition Mitglied und suche dir deine grüne Quelle selbst aus.

Join

Lition - Trading Platform

Monochromacy

LITION

OVERVIEW

MY DOCUMENTS

SUBMIT METER READINGS

BUY ENERGY

DIRECT TRADING

PROFILE

Peak Capacity 0,4 MW

Ethereum Address 0x9814c0bb122018657677d8dd28cf016e9848d19b

Location Torgauer Str. 12-15, 108 29 Berlin, de

Die Anlage mit einer installierten Leistung von 0,40 MW und einer voraussichtlichen Einspeisemenge von 1.700 MWh pro Jahr wird durch die GASAG Solution Plus GmbH betrieben und über die GASAG AG vermarktet.

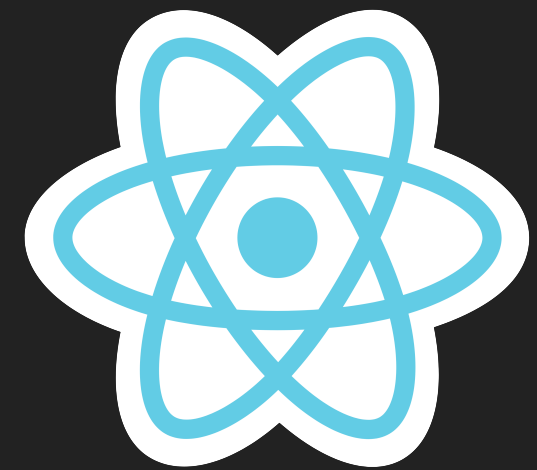
Show producers Select Producer

FRAMEWORKS REACT.JS

<https://reactjs.org/docs/accessibility.html>

<https://facebook.github.io/create-react-app>

<https://github.com/evcohen/eslint-plugin-jsx-a11y>



```
return (  
  <div  
    id={widgetId}  
    className={classes}  
    role="region"  
    aria-controls={widgetContentId}  
    aria-live="polite"  
    aria-expanded={expanded ? true : undefined}  
  >  
    <a/>  
    <div  
      id={widgetContentId}  
      className="ltn-disclosure-widget-content"  
      aria-labelledby={widgetId}  
      aria-hidden={expanded ? undefined : true}  
    >  
      {children}  
    </div>  
  </div>  

```

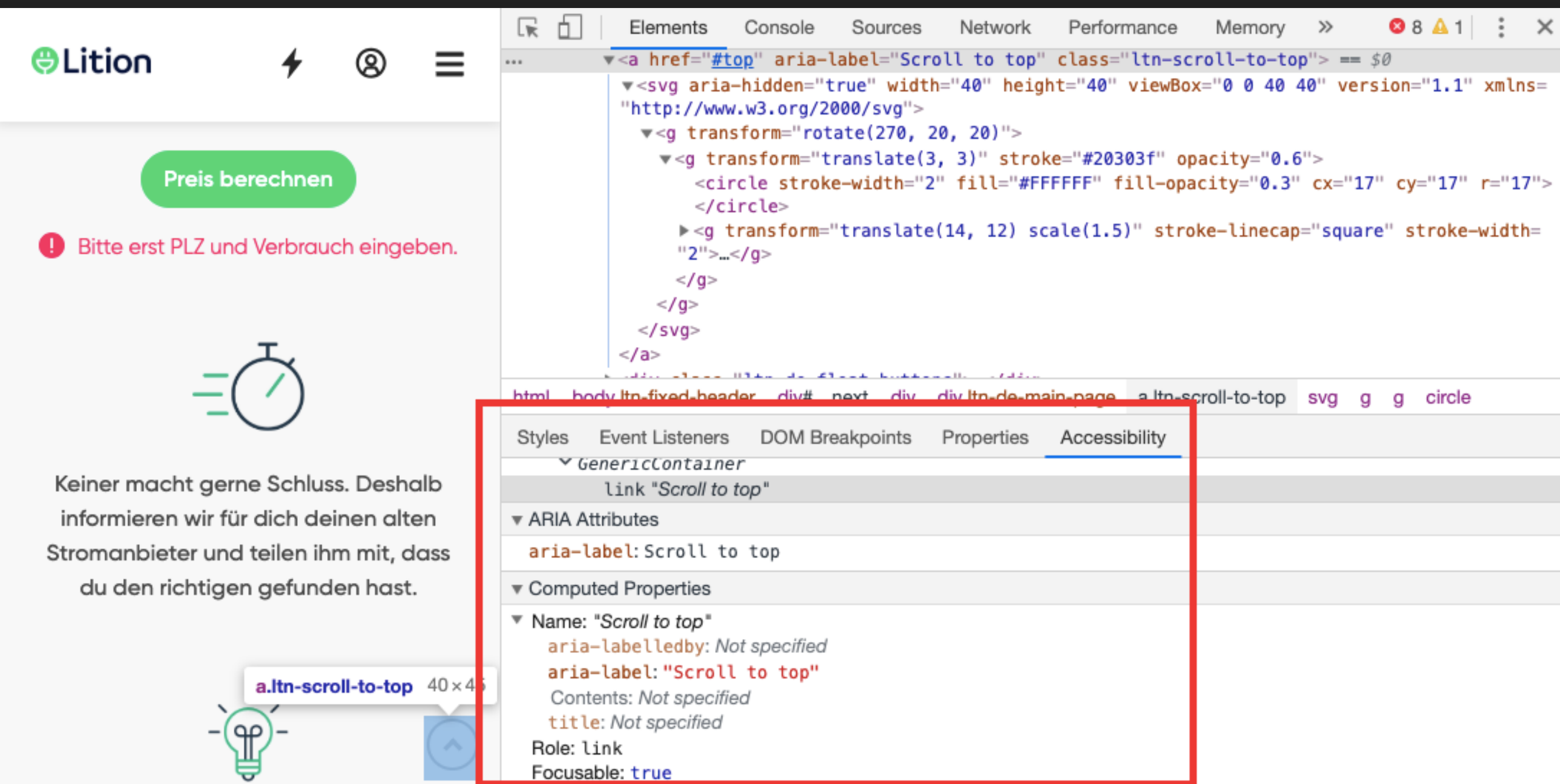
```
DisclosureWidget.propTypes = {
```

FRAMEWORKS VUE, ANGULAR, EMBER, EXT, WP

- <https://github.com/vue-a11y>
- <https://vue-a11y.com>
- <https://docs.angularjs.org/guide/accessibility>
- <https://material.angular.io/cdk/a11y/overview>
- <https://github.com/ember-a11y>
- <https://guides.emberjs.com/release/reference/accessibility-guide>
- https://docs.sencha.com/extjs/6.0.2/guides/core_concepts/accessibility.html
- <https://wordpress.org/plugins/tags/accessibility>



ТЕСТИРОВАНИЕ ACCESSIBILITY TREE



The screenshot shows a web browser with the Lition logo and a green button labeled "Preis berechnen". Below the button is a red error message: "Bitte erst PLZ und Verbrauch eingeben." and a clock icon. At the bottom, there is a lightbulb icon and a tooltip for the "a.ltn-scroll-to-top" element, which is 40x40 pixels.

The browser's developer tools are open, showing the Accessibility tree for the "Scroll to top" link. The tree structure is as follows:

- GenericContainer
 - link "Scroll to top"
 - ARIA Attributes
 - aria-label: Scroll to top
 - Computed Properties
 - Name: "Scroll to top"
 - aria-labelledby: Not specified
 - aria-label: "Scroll to top"
 - Contents: Not specified
 - title: Not specified
 - Role: link
 - Focusable: true

ТЕСТИРОВАНИЕ ACCESSIBILITY TREE

The screenshot shows a web browser window with the address bar displaying `https://staging.lition.de`. The page title is "Lition - Trading Platform". The main content area displays the Lition logo and a message: "Keine Verträge" (No contracts). A white tooltip is visible over the message, containing the text: "wende dich an den Administrator, oder versuche es später erneut." (contact the administrator, or try again later).

The Accessibility Inspector is open, showing the Accessibility Tree. The tree structure is as follows:

- Role: section:
 - Role: section:
 - Role: section:
 - Role: text container:
 - Role: text container:
 - Role: text leaf: "Zur Zeit können keine Ve...suche es später erneut."
- Role: landmark:
 - Role: section:
 - Role: section:
 - Role: landmark:
 - Role: paragraph:

The properties for the selected text leaf are:

- name: "Zur Zeit können keine Vertragsaten abgebildet w..."
- role: "text leaf"
- actions: []
- value: ""
- DOMNode: #text
- description: ""
- keyboardShortcut: ""
- childCount: 0
- indexInParent: 0
- states: [...]
- relations: {...}

ТЕСТИРОВАНИЕ ACCESSIBILITY TREE

The image shows a screenshot of the Lition website on the left and the Accessibility Inspector tool on the right. The website has a header with the Lition logo and a hamburger menu. The main heading is "Entscheidung." followed by a paragraph about Lition's services. Below this is a form with two input fields: "Deine PLZ" and "Dein Verbrauch", and a green button labeled "Preis berechnen".

The Accessibility Inspector tool is open, showing the DOM tree on the left and the Accessibility Tree on the right. The DOM tree shows a nested structure of divs and a form. The Accessibility Tree shows the following information for the selected element:

Узел	
Слушатели события	
keyup	
mousedown	
mousemove	
mouseup	
reset	
selectionchange	
submit	
Универсальный доступ	
Роль	button
Этикетка	Preis berechnen
Родитель	form:role(form)
Активный	Да
В фокусе	Нет

ТЕСТИРОВАНИЕ

- ▶ VoiceOver (MacOS)
- ▶ NVAccess, JAWS (Windows)
- ▶ AXE, ChromeVox (Ubuntu)

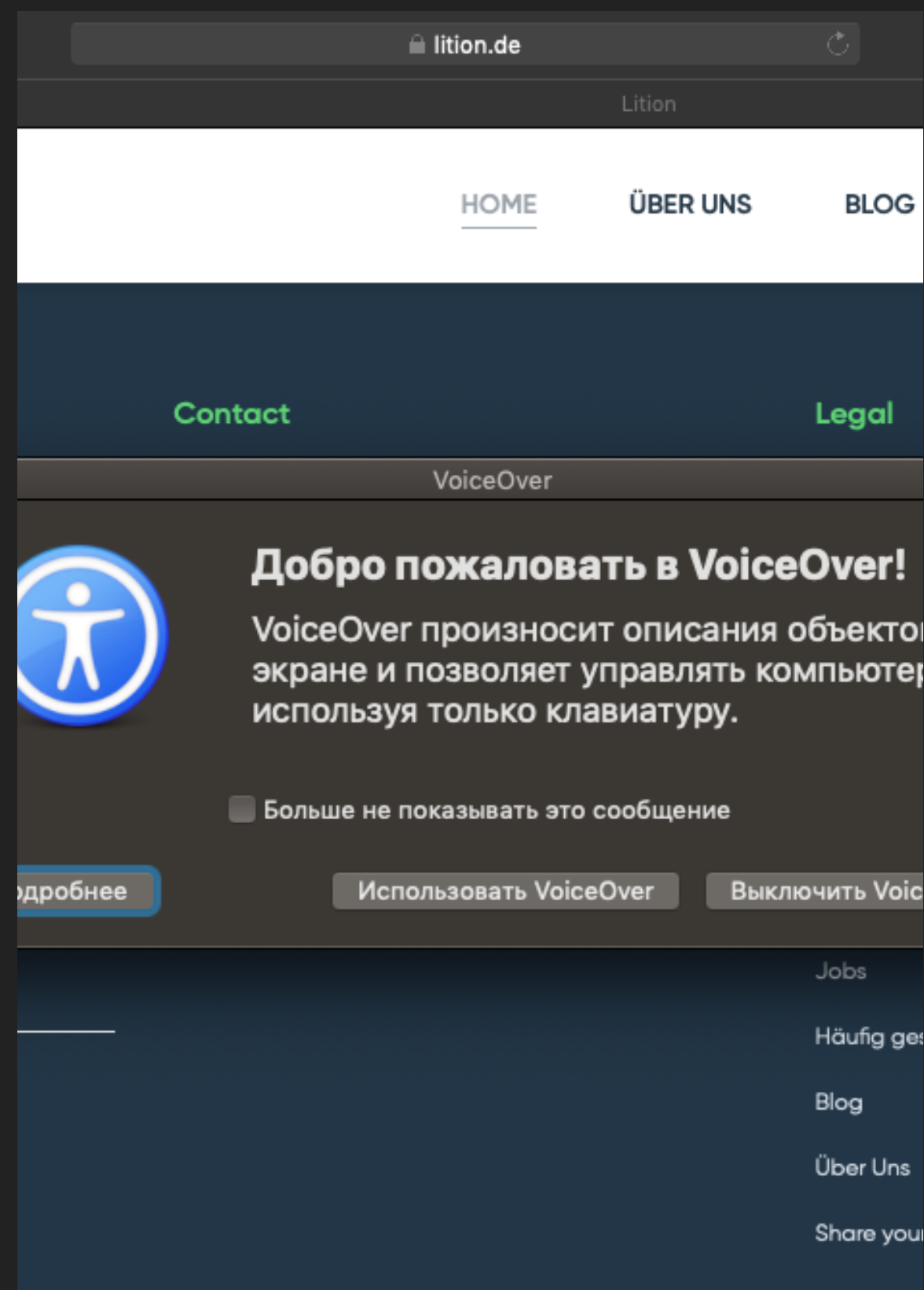
<https://www.apple.com/ru/accessibility/mac/vision>

<https://www.nvaccess.org>

<https://support.freedomscientific.com/JAWSHQ/JAWS>

<https://www.deque.com/axe/axe-for-web/integrations>

<https://www.chromevox.com>



АВТОМАТИЗАЦИЯ LIGHTHOUSE

The screenshot shows a web browser window with a tab for 'Lition' and the address bar displaying 'lition.de:8888'. The Lighthouse interface is open, showing the 'Audits' tab. The main content area displays the 'Accessibility' audit results, which include a score of 95. The audit description states: 'These checks highlight opportunities to [improve the accessibility of your web app](#). Only a subset of accessibility issues can be automatically detected so manual testing is also encouraged.'

The 'Elements Are Well Structured' section shows a list of additional items to manually check, including '[id] attributes on the page are not unique'. Below this, there are sections for 'Additional items to manually check' (12 audits), 'Passed audits' (21 audits), and 'Not applicable' (12 audits).

The 'Runtime settings' section at the bottom provides details about the audit run, including the URL, fetch time, and device used.

АВТОМАТИЗАЦИЯ LIGHTHOUSE-CI

```
bitbucket-pipelines.yml x
38 - ssh ec2-user@staging.www.lition.de "sleep 5"
39 - ssh ec2-user@staging.www.lition.de "lighthouse-ci --accessibility=80 --best-practices=75 --seo=90 http://new.lition.de:8888"
40 - ssh ec2-user@staging.www.lition.de "lighthouse-ci --accessibility=90 --best-practices=85 --seo=90 http://new.lition.de:8888/producers?"
41 - ssh ec2-user@staging.www.lition.de "lighthouse-ci --accessibility=90 --best-practices=85 --seo=90 http://new.lition.de:8888/producer-d
42 - ssh ec2-user@staging.www.lition.de "lighthouse-ci --accessibility=90 --best-practices=85 --seo=90 http://new.lition.de:8888/signup?zip
43
44 master:
45 - step:
46   name: Deploy to production
47   deployment: production
48   caches:
49   - node
50   script:
```

<https://www.npmjs.com/package/lighthouse-ci>

Pipeline



Deploy to staging

3m 59s

```
ssh ec2-user@staging.www.lition.de "lighthouse-ci ..." 10s ▾
```

```
+ ssh ec2-user@staging.www.lition.de "lighthouse-ci --accessibility=90 --be
- Running Lighthouse on https://www.lition.de ...
```

performance: 44

pwa: 54

accessibility: 94

best-practices: 93

seo: 100

All checked scores are passing. 🎉



СПАСИБО
ЗА ВНИМАНИЕ!

<http://rrrh.ru/article/dogchoice/2047>